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# QST

January, 1955

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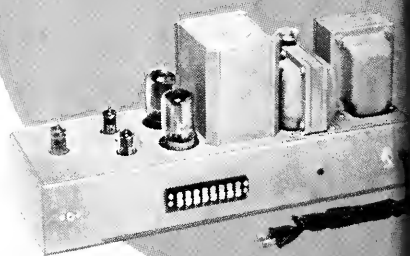
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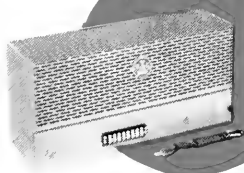
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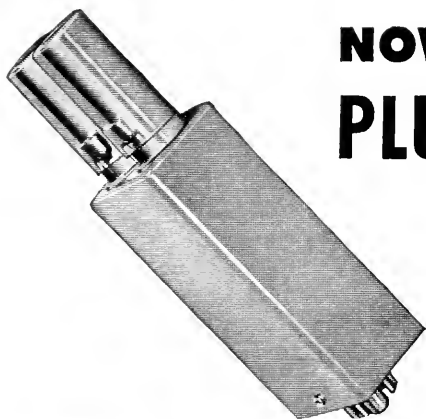
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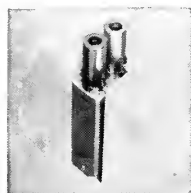
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353A-12	1.2 kc	3.0 kc
353A-31	3.1 kc	7.0 kc
353A-60	6.0 kc	12.6 kc

Net Each-----\$65.00

The 353A-series Adapter is shown in a Hammerlund SP-400. The 353A-series Adapter also fits the National HRO-60.



Adapter Type	Bandwidth At -6 DB	Bandwidth At -60 DB
353B-08	0.8 kc	2.5 kc
353B-12	1.2 kc	3.0 kc
353B-31	3.1 kc	7.0 kc
353B-60	6.0 kc	12.6 kc

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The 353B-series Adapter between the IF cans in the SP-600-JX receiver.



Adapter Type	Bandwidth At -6 DB	Bandwidth At -60 DB
353D-08	0.8 kc	2.5 kc
353D-12	1.2 kc	3.0 kc
353D-31	3.1 kc	7.0 kc
353D-60	6.0 kc	12.6 kc

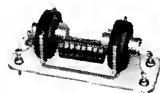
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The 353D-series Adapter in the National HRO-50 or HRO-50T1.

Popularity of Collins Mechanical Filters and Mechanical Filter Adapters in the 75A Amateur Receivers has resulted in many requests for Mechanical Filter Adapters designed for use in other popular receivers.

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The convenient plug-in feature of the Filter Adapter provides a means for selecting a choice of bandwidth for reception of CW, AM, SSB or FSK. For example, the 800 cycle bandpass Adapter may be plugged in for CW reception; the 1.2 kc Adapter for either CW or FSK; the 3.1 kc Adapter for AM or SSB; and the 6.0 kc Adapter for AM.



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F455-series \_\_\$35.00 F250Z-series (3.2 kc)\_\_\_\$60.00  
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## FREE LITERATURE AT YOUR REQUEST

Booklets describing Mechanical Filters and Mechanical Filter Plug-In Adapters are available. Included are response curves, detailed theory of operation, circuit applications, and other informative data. See your local distributor or contact a Collins Sales Office.

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COLLINS RADIO COMPANY OF CANADA LTD.  
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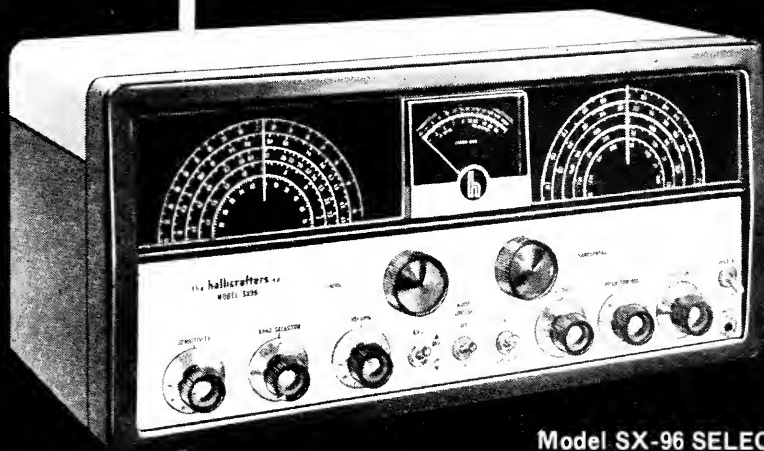
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39.8°—205.2° (165.4°)

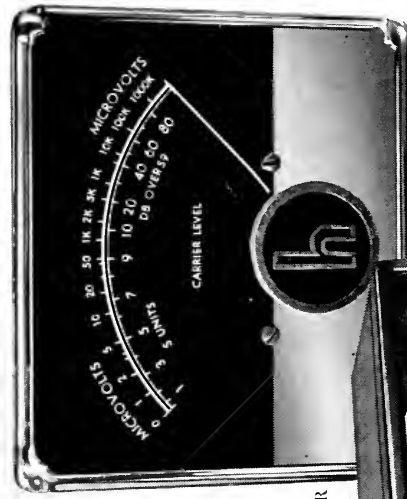
15 Meters  
20.2 Mc—21.6 Mc  
25°—260.5° (235.5°)

80 Meters  
3.5 Mc—4 Mc  
16.8°—275° (259.8°)

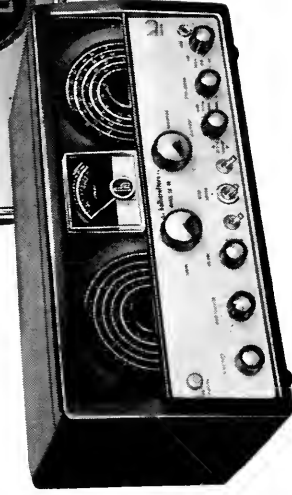
20 Meters  
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20°—249° (224°)

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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WALTER R. JOOS, W6EKM  
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4327 Santa Cruz, San Diego 7, Calif.

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Vice-Director: John F. Skelton, W5MA  
1901 Standish Dr., Irving, Texas



# "It Seems to Us..."

## THE YEAR IN REVIEW

In 1954 the American Radio Relay League marked the 40th year of its founding as a non-profit membership association "of, by and for the radio amateur." It was a banner year in most respects. Full membership reached the highest figure in our history, and the proportion voting in the autumn director elections showed this to be an active, participating interest on the part of members in their national association. *QST* continued to grow in size and scope, perhaps soon to present another problem of enlarging the yearly binders so that twelve issues can be fitted into them!

At yearend a new publication, *Single Sideband for the Radio Amateur*, appeared in order to cater to and encourage amateur use of this growing field. Considerable publicity on the attractiveness of amateur radio as a hobby appeared in various magazines, resulting in thousands of inquiries to Headquarters on how to get into the hobby, and also resulting in a heavy demand this year for "beginner" publications. The 1954 financial statement will again show new highs in gross income and outgo.

While it is only late November as we write, it appears unquestioned that amateur radio itself is reaching a peak of growth, totaling perhaps 125,000 licensees. During the early part of the year a license fee seemed imminent, but it has since been pigeonholed. A major change occurred in June with the placing of Novice and Technician Class examinations on a mail-only basis, so that with the reduced distance for Conditional Class eligibility, amateurs themselves are conducting more than half of FCC exams for newcomers. New questions were added to the General Class exam to expand its scope and bring it up to date. The requests to increase the size of the voice allocation at 14 and 28 Mc. were turned down by FCC. Duplex operation on 50 Mc. was authorized, as was maritime mobile use of 21 Mc. General approval was given to the security control program, "Conelrad," for amateurs, with specific proposed regulations to follow. The League was signally honored with the visit, in January, of five members of the Federal Communications Commission and two staff Bureau heads.

Despite generally poor conditions for DX, more than 2600 amateurs have now qualified for the DX Century Club roster. They, with DXCC aspirants, are encouraged by the knowledge that as the sunspot cycle swings to a more favorable point, propagation conditions are rapidly improving and the now-occasional openings of 21 Mc., for example, will soon become everyday occurrences. With more than 8000 individual participants reported, manning more than 2000 transmitter-receiver installations, the ARRL Field Day was again the biggest ever. From the roars of "CQ SS" that covered the bands those November week ends, we'll predict the same for that popular activity. "Above 50 Mc." activity has a banner year also: more than 600 amateurs took part in the January V.H.F. Sweepstakes; a coast-to-coast relay on 144-Mc. was completed in June; and the 10,000-Mc. DX record was set and broken three times during the year — it now stands at 109 miles! "Burst" reception from meteor reflections was the means of several long-distance QSOs, and experimentation with this form of communication attracted considerable attention, not only among amateurs but also in professional fields.

At midyear a nationwide test of civil defense organization and facilities showed amateurs fully ready to perform their auxiliary communications functions. The Simulated Emergency Test in October continued to be another means of keeping amateur emergency skills at peak efficiency. RACES licensing continued to grow, with one-half of the States already having approved plans. Both civil defense and normal amateur emergency-preparedness organizations performed admirably in the East Coast hurricanes. The TVI specter was reduced to a skeleton, as more and more amateurs find the best way to lick the problem is to tackle it. The League's demonstration was given at a number of western cities, completing coverage of the country where low-band channels are in use.

Once again as we come to the close of a year we find that amateur radio can take pride in an outstanding performance, through the organized activities of its national association, and a meritorious record of performance "in the public interest, convenience and necessity."

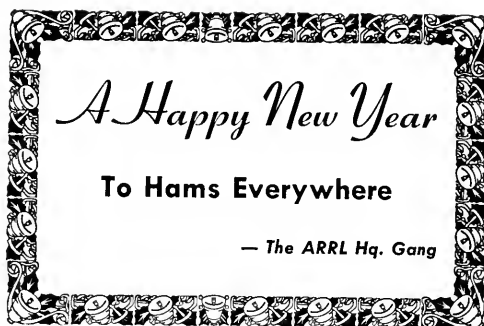
## OUR COVER

This month's cover shows the interior of W3SMQ, Lansdowne, Pa. Equipment is completely homebuilt, following designs presented in *The Radio Amateur's Handbook*. In the rack at the left are the modulator and power supplies. On the desk is a push-pull 807 rig running 150 watts. To the right are the VFO and an 8-tube superhet. A Monitone is to the right of the receiver, and a *Handbook*-design antenna tuner on the window sill, upper left. Operator and constructor of W3SMQ is W. P. Hampton.

## A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner. (Bold-face type indicates change since last QST listing.)

- W1, K1 — J. R. Baker, jr., W1JOJ, Box 232, Ipswich, Mass.  
W2, K2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.  
W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.  
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.  
W5, K5 — Oren B. Gambill, W5WI, 2514 N. Garrison, Tulsa 6, Okla.  
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.  
W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.  
W8, K8 — Walter E. Musgrave, W8NGW, 1294 E. 188th St., Cleveland 10, Ohio.  
W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wis.  
W0, K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.  
VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.  
VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.  
VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.  
VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.  
VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.  
VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.  
VE7 — H. R. Hough, VE7HR, 2316 Trent St., Victoria, B. C.  
VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.  
VO — Ernest Ash, VO1A, P. O. Box 8, St. John's, Newfoundland.  
KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.  
KH6 — Andy H. Fuchikami, KH6BA, 2543 Nāmāu Dr., Honolulu, T. H.  
KL7 — Box 73, Douglas, Alaska.  
KZ5 — Gilbert C. Foster, KZ5GF, Box 407, Balboa, C. Z.



January, 1930

The editorial discusses the new 14,000-ke. 'phone band, pointing out its advantages as well as potential difficulties which can result from bad judgment and poor equipment.

A poor man's power transformer using hand-wound primary and filament coils and junk-box honeycomb coils for secondaries is described by E. H. Harrington, jr., W9CRR. Almost 900 volts each side of center tap can be furnished by the unit, which costs about four dollars.

Station of the month is W9BAG, owned by Frank Smolek of Chicago. The transmitter is a 50-watt crystal rig using Heising modulation on 'phone and buffer-filament keying on c.w. The receiver is a superhet, with a regenerative first detector, two i.f. stages, regenerative second detector, and audio. A two-inch cage suspended 45 feet in the air between two steel towers, with 70-foot aerial and counterpoise, serves as the radiator.

Results of the Board of Directors elections are made known. Alex Reid is the new Canadian General Manager; Prof. E. C. Woodruff returns as Atlantic Division Director; Dakota Division elects Cy. L. Barker; M. M. Hill represents the Delta Division; Louis R. Huber is Midwest Division Director; the Pacific Division chooses Allen H. Babcock; and Harry F. Dobbs becomes the Southeastern representative.

Trophies for the first Sweepstakes contest, a two-week period, are announced. Sweep brooms, three feet long, decorated in the League's black-and-gold, with radio tube handle-grips will be given to the top three men in the new contest.

This month's humorous story by "Felix," W5LS, entitled "Hams Are Born — Not Made," involves W. M. "Soupy" Groves, W5NW, and his "Brother-in-law."

A.c. receivers are discussed by Beverly Dudley, assistant technical editor. The author describes several circuits which were tried, and gives details of the final result, a completely-shielded receiver using a UV-224 r.f. stage, UV-224 regenerative detector, and a UV-227 audio amplifier.

# More About V.H.F. Auroral Propagation

## Recent Findings and Suggestions for Improved Results

BY ROLF DYCE,\* W2TTU

THE characteristics of propagation associated with the northern lights have been described in the pages of *QST* by Moore.<sup>1</sup> As v.h.f. communication equipment has improved, amateur use of auroral propagation has multiplied over the past few years, especially above 144 Mc. A program of amateur auroral reporting was initiated in 1951, some of the information gathered thereby appearing in "The World Above 50 Mc." These reports were then sent on to Cornell, where a statistical study has been attempted. Some results are presented here. Research in England,<sup>2</sup> Scandinavia,<sup>3,4</sup> Canada,<sup>5</sup> and Alaska<sup>6,7</sup> has progressed rapidly since 1950, yielding new ideas about auroral v.h.f. reflections which may be useful to the amateur for understanding the behavior of such propagation.

### Description of Auroral Signals

An aurorally-propagated signal has a characteristic growl or hiss due to a fast QSB that is at an audio rate up to several hundred cycles per

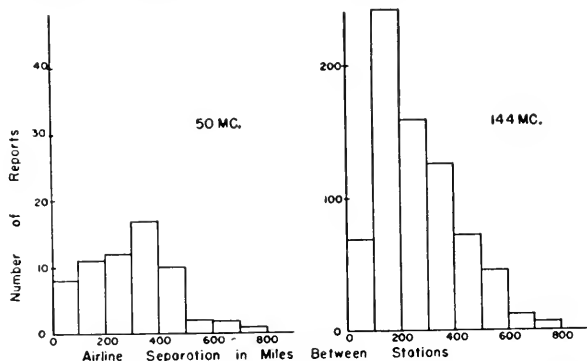
The b.f.o. will usually not give a clean note, so this is a sensitive test for signals propagated by aurora.

Unlike *E*- or *F*-layer propagation, strongest signals are usually obtained when both stations point their antennas northward, regardless of the actual great-circle bearing between stations. Often all stations will appear to come from the same direction in the north, as if a small portion of the aurora is responsible for all the propagation. During especially strong aurora, often accompanied by active overhead displays, the signals may appear to come from a variety of directions spread about north. However, in general, stations located to the east of the receiving station will have preferable directions eastward of magnetic north and likewise for westerly stations.

### Amateur Reports

Amateur reports of auroral propagation, collected with the help of ARRL and dating back to 1951, have been assembled at the Cornell

Fig. 1 — Useful working distances obtainable by auroral communication. Data taken from amateur reports.



second.<sup>8</sup> As the carrier frequency is increased from 50 to 144 Mc., the growl increases in pitch. 'Phone is badly garbled although relatively slow c.w. telegraphy can get through without difficulty.

\*Cornell University Ionosphere Project, Franklin Hall, Ithaca, New York.

<sup>1</sup> Moore, "Aurora and Magnetic Storms," *QST*, 35, No. 6, June, p. 14 (1951). See also *Journal of Geophysical Research*, 56, March, pp. 97-106 (1951).

<sup>2</sup> Aspinall and Landmark, *Journal British Astronomical Association*, 60, April, p. 130 (1950).

<sup>3</sup> Harang and Landmark, *Journal of Atmospheric and Terrestrial Physics*, 4, January, p. 322 (1954).

<sup>4</sup> Hellgren and Meos, *Rept. No. 26*, Chalmers University of Technology, 1952. See also *Tellus* 4, p. 249 (1952).

<sup>5</sup> Currie, Forsyth, and Vawter, *Journal of Geophysical Research*, 58, June, p. 179 (1953).

<sup>6</sup> Bowles, presented at URSI-IRE Meeting at Washington, D. C., April, 1954.

<sup>7</sup> Dyce, presented at URSI-IRE Meeting at Washington, D. C., April, 1954.

<sup>8</sup> Bowles, *Journal of Geophysical Research*, 57, June, p. 191 (1952).

Ionosphere Project. The individual stations were located on a map, and the direct airline distance was measured between pairs of stations reporting communication. This does not imply that the radio path was along this measuring line, but merely tells one at what distance communication was possible. Histograms showing the likelihood of occurrence of certain distances are given in Fig. 1. A similar graph for sporadic-*E* signals on 50 Mc. shows a prominent maximum at about 800 miles, with a "skip" region for shorter distances. However, notice in Fig. 1 how the probability of communication by auroral propagation falls off with distance. The graph below 100 miles is too low due to (1) blanketing strength of direct or tropospheric signal, (2) failure of amateurs to log familiar and nearby stations, (3) fewer amateurs because the inner ring contains less land area and hence fewer amateurs.

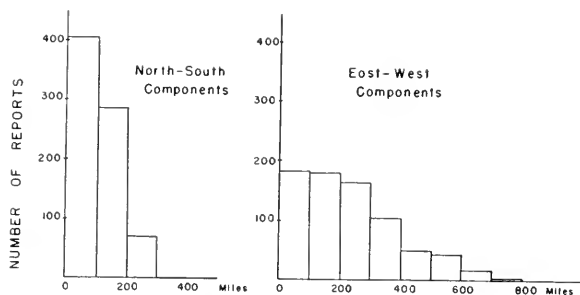


Fig. 2 — Communication is better along east-west directions. The airline distance between 144-Mc. stations working via aurora, expressed in two components, shows east-west distances far greater.

The 50-Mc. data suffer from the same errors, in addition to the fact that only one-tenth as many reports were sent in.

The information contained in Fig. 1 gives a measure of the distance over which auroral communication is to be expected. Such information would be difficult to obtain without the use of amateur reports. This graph also supports the view that auroral propagation is not a skip phenomenon, as was recently suggested in Norway.<sup>3</sup>

The 144-Mc. data were reexamined and the distance between each pair of stations expressed in two components—a north-south and an east-west distance. The results appear in Fig. 2. A difference in the two components is clearly seen, showing that east-west paths are generally longer than north-south paths. This effect may be due to the oblong shape of the population distribution, since most reports came from a narrow region extending from Ohio to Massachusetts. However, the preference for east-west station-to-station direction is also explained by a theory later to be discussed.

### An Auroral Signal Recorder

A scheme for automatically recording auroral signals has been assembled at the Cornell Ionosphere Project and has been operating almost continuously now for two years. Many amateurs are already familiar with the high-power transmissions continuously, day and night, from Cedar Rapids, Iowa, on 49.6 and 49.8 Mc.

Cornell University at Ithaca, New York, is located so that these transmissions come in strongly by auroral propagation, when it is present. It is possible to obtain a continuous record of auroral openings merely by attaching a recording milliammeter to the d.c. output from the detector. The QSB on an auroral signal is too fast for the recording pen to follow, so an average value is painted on the recording chart when auroral signals are present—see Fig. 3. Strong and frequent bursts of signal due to meteors can be obtained over the Cedar Rapids-to-Ithaca path. They provide an easy means of verifying that the transmitter is operating and for setting the receiver tuning. The occurrence of auroral signals as recorded in this manner correlates very well with such openings as reported by amateurs. Amateurs in general, and Michigan amateurs in particular, seem to have sharp ears because even brief occurrences of auroral propagation are caught at least by some. Of course, there are short periods when amateurs report auroral signals when Cedar Rapids has faded out. The reverse is also true. The recorder scheme provides a continuous check on the auroral signals throughout the entire night and is therefore useful for studying daily and seasonal variation in the frequency of occurrence of the auroral propagation. Records of auroral signals are a help in early warning of openings and in predicting subsequent openings.

A graph showing expectation of auroral propa-

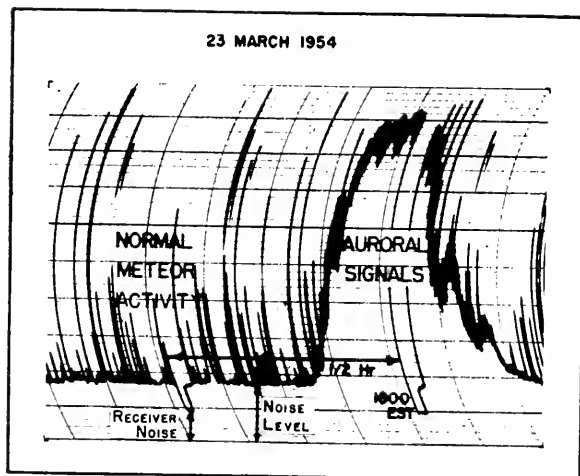
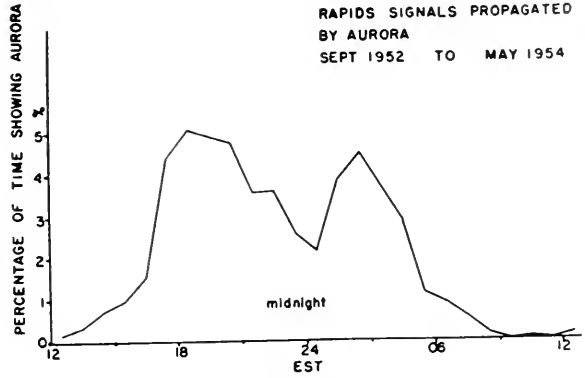


Fig. 3 — Example of a short auroral opening beginning about 5:50 P.M. Esterline-Augus record of the 49.8-Mc. signal from Cedar Rapids shows need for checking v.h.f. bands in early evening hours. Blank spots on hour and half hour are 2-minute periods when transmitter is turned off automatically.

Fig. 4 — Good times for auroral propagation are 6:00 P.M. and 2:00 A.M.



#### Position in Space of the Ionization Involved

gation at any time of day appears in Fig. 4. Isolated cases of auroral signals have been observed at almost every hour, but the phenomenon is chiefly a nighttime one. This curve emphasizes the importance of observation just before supper-time. An interesting dip near midnight shows up, for which no explanation is here offered. It shows that openings frequently continue into the early morning hours, although they may die out temporarily around midnight. There are also cases of auroral openings after midnight not accompanied by auroral signals earlier.

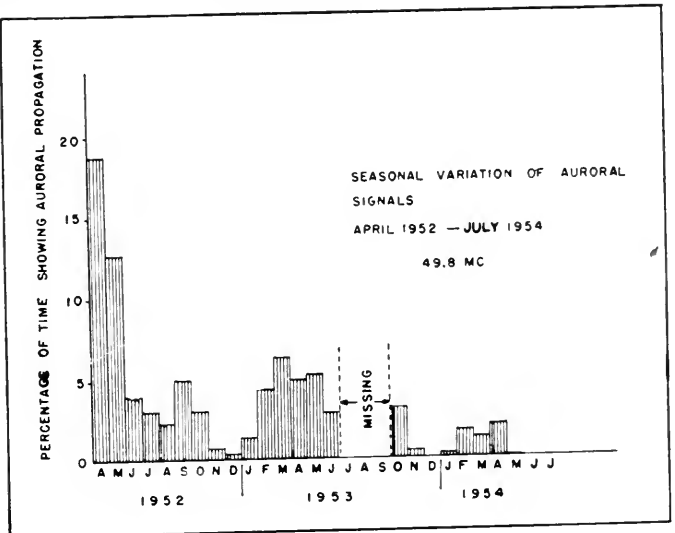
Most of the organized research concerning auroral propagation has been done using radar. That is, by transmitting only for a brief instant (about 1/10,000 of a second) and measuring the time for this pulse to return to the receiver, one can determine the distance to the auroral ionization. Accompanied by a sharply directional antenna, the range and azimuth of auroral echoes can therefore be determined by a single station.

The seasonal variation was plotted in Fig. 5 by determining for each month the percentage of time that auroral propagation was present. Maxima of auroral propagation can be seen to occur in March and October, with important minima in December and June. A decrease can be seen from 1952 to 1954 that is believed to be authentic. This is attributed to the decrease in the sunspot activity over the past few years, expected to reach a minimum some time in 1954. With this information, one can better predict when auroral signals can be expected, or putting it another way — when no auroral propagation should be observed.

Some radar experiments were done at Cornell on 103 Mc., using a high-powered war-surplus search radar.<sup>9</sup> This used a large antenna 8 dipoles vertically and 4 dipoles in width, the whole affair being rotatable. Echoes were obtained about 400 to 600 miles to the north. There was fairly good correspondence between the echoes obtained and ray activity (vertical streaks) seen by eye. There never had been enough auroral activity to determine whether one could obtain echoes when aurora was overhead.

<sup>9</sup> Thayer, Master's thesis, Cornell University, 1952.

Fig. 5 — September and March are good months for auroral propagation. The decrease from year to year shown here should reverse after the 1954 sunspot minimum.



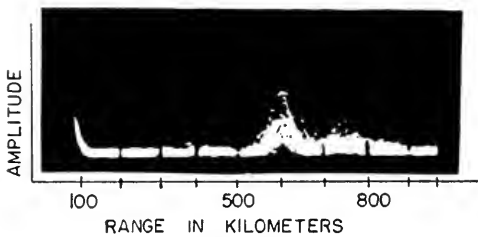


Fig. 6—Typical 50-Mc. auroral echo. The trailing edge of the 51.7-Mc. transmitter pulse is seen at the far left. Two auroral echoes can be seen delayed in time corresponding to 600-km. and 720-km. range.

During the summer of 1953, Ken Bowles (W2MTU, ex-ZGP) and the author had an opportunity to work at the Geophysical Institute at the University of Alaska. The Institute is located at College, Alaska, a few miles from Fairbanks. It is, therefore, only 100 miles to the south of the maximum auroral-activity zone which forms a ring around the earth's magnetic pole. Some observations will now be described that were performed by the author during 1953, and which are illustrative of recent research now under way at several locations. Aurora is seen frequently, is strong and occurs frequently over the entire sky including south of overhead. Hence, this northern latitude affords an excellent place to observe the effects of visible aurora on v.h.f. propagation.

Arrangements were made to operate a c.w. beacon transmitter on 51.9 Mc. about 100 miles to the east. The signal could usually be heard

weakly by troposphere propagation, but was heard when aurora was present coming from the north with the characteristic growing auroral QSB. On a different frequency assignment of 51.7 Mc., permission was obtained to install a transmitter five miles away sending pulses 150 times per second, each being about 100 microseconds in duration. The transmitting antenna was originally a horizontal dipole to send radiation in all directions in the meridian plane. A rotary 4-element Yagi was then used for receiving, using a low-noise crystal-controlled converter and a Super-Pro receiver. The d.c. detector output was fed into an oscilloscope, the strong direct signal coming from the transmitter being used to initiate each sweep. With the antenna pointing north during aurora and with the 51.9-Mc. station coming in by auroral propagation, weak echo pulses could be obtained, and the range easily estimated. (See Fig. 6.)

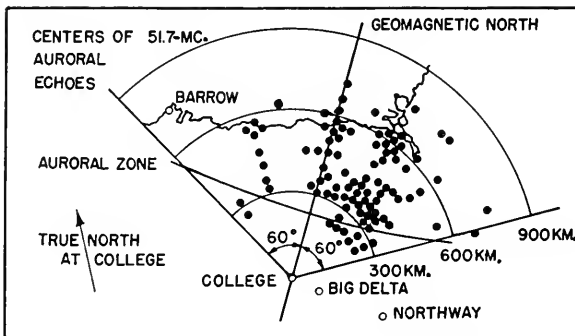


Fig. 7—Each point represents maximum auroral activity at a different time. Azimuth determinations were usually made using a c.w. transmitter equipped with a turnstile omnidirectional antenna, with a directive array on the receiver. A hill impeded observations to the northwest.

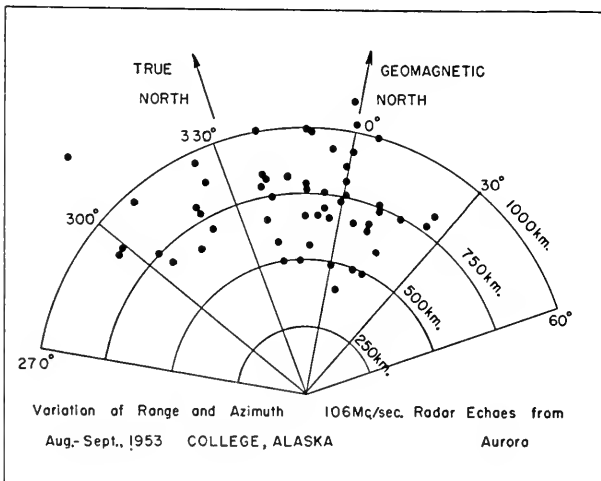
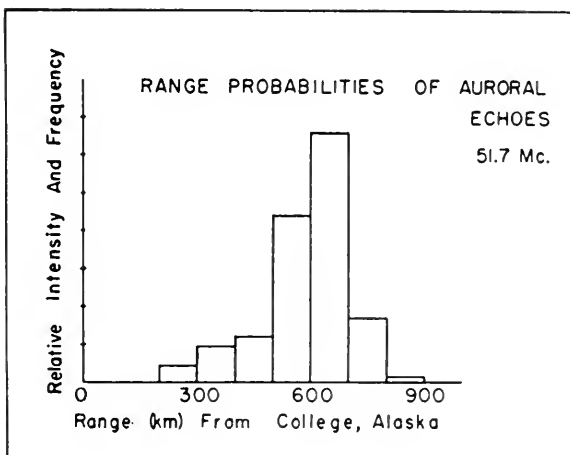


Fig. 8—Results using high-powered search radar on 106 Mc. (Courtesy of K. Bowles)



Fig. 9 — Auroral radar echoes do not occur at short distances.



It has been shown by parallax photography that most visible auroral light comes from about the *E* region at a height of about 60 miles, or 100 kilometers.<sup>10</sup> One would, therefore, expect to encounter echoes as close—but no closer—than about 100 km., and also to find echoes from the south when visible auroral forms could be seen there. This was quickly seen to be not the true state of affairs. Echoes were obtained mainly from distances greater than about 400 kilometers and were never obtained from the south. Contrary to expectations, most echoes came from places far to the north of the auroral zone as shown in Figs. 7 and 8. The echoes clearly came mainly from the northern quadrant. Some continuous film records of echo range were made at 51.7 Mc. They gave the statistical result shown in Fig. 9, showing a pronounced tendency for the echoes to have ranges of 500 km. or greater.

To rule out the possibility that these echoes might be coming from overhead ionization at a height of 500 km., an antenna with a vertical main lobe was constructed for comparison purposes. Six half-wave elements in a broadside array were suspended above the flat metallic roof of the Geophysical building. A separate

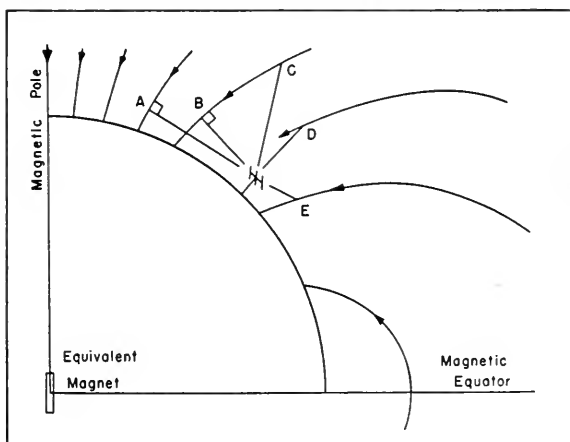
converter, receiver, and oscilloscope were connected, so that the observer could watch both antenna presentations simultaneously. Echoes from meteors were seen with both antennas, indicating that both sets of receivers were working properly. Next, observations of auroral echo range were made when overhead arcs, bands, rays, and corona were present. These occur frequently at College. All auroral echoes were definitely much stronger on the rotary Yagi antenna which was looking at low angles. Similar results were found with the 106-Mc. radar equipment by tilting the regular antenna to point overhead during overhead aurora. These experiments show that auroral echoes are (1) from targets at great distances, probably at a height of about 100 kilometers, and (2) from low angles of elevation, no matter where in the sky the visible auroral forms occur.

At College, one frequently sees streaks of auroral light rising from the western horizon, extending overhead and down to the eastern horizon. It has already been shown that the v.h.f. echoes were not coming from the overhead

(Continued on page 116)

<sup>10</sup> Stormer, *Terrestrial Magnetism and Atmospheric Electricity*, 51, December, pp. 501-504 (1946).

Fig. 10 — For v.h.f. propagation, the bounce-point needs to be roughly perpendicular to the field of the earth's magnetic force, even if auroral ionization existed over the entire sky. In this exaggerated picture, beams A and B give echoes, but C, D, and E do not.



# Bandswitching a Crystal-Controlled Mobile Converter

*Using the B.C. Receiver as a Tunable I.F. for 3.5-30-Mc. Reception*

BY C. VERNON CHAMBERS, W1JEQ

ALTHOUGH the converter shown in the photographs was designed primarily for mobile use, this relatively simple unit will add gain and stability to almost any of the less-expensive communications receivers that include the broadcast range. While one might conclude from its compactness that it is rather difficult to construct, carefully planned subassemblies make the job comparatively easy. In a mobile installation, the unit can be suspended directly under the car broadcast receiver, where it is hardly noticeable and detracts nothing from the appearance of the instrument panel, nor from the comfort of front-seat passengers.

The high-frequency oscillator in a crystal-controlled converter is fixed in frequency, of course. Therefore, this system departs from the more conventional in that the b.c. receiver, rather than the converter, is used to tune over the ham bands. The frequency stability gained by the use of crystal control is hard to appreciate until you have tried it. Over rough roads, at any speed, even 10-meter signals stay put. Only a jolt hard enough to detune the broadcast receiver will change the frequency.

Another advantage that is sometimes overlooked is the fact that most car receivers (and all communications receivers) have good dials that are easy to handle and conveniently located. This is in contrast to the miniature controls

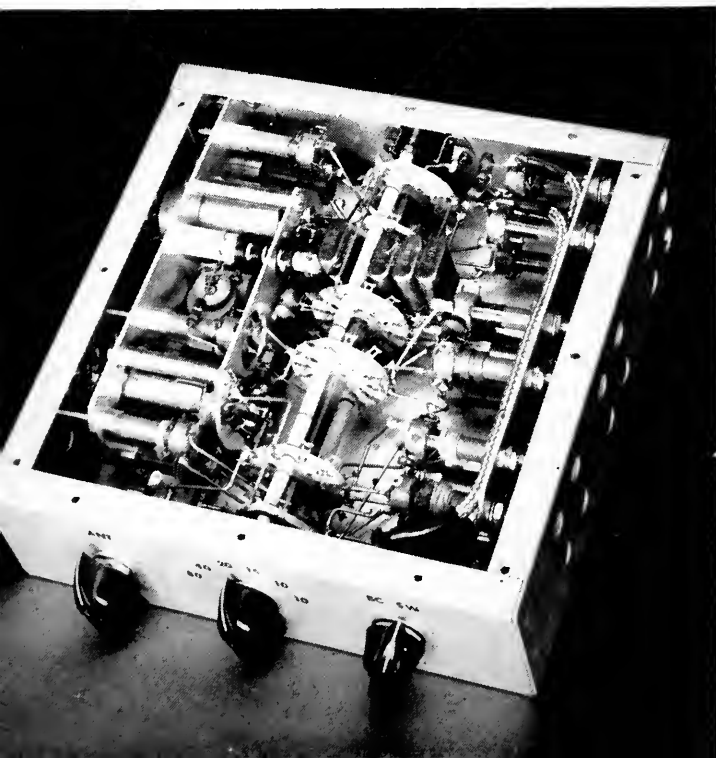
found on most tunable mobile converters as a result of the effort to keep within minimum dimensions. Even the smallest tunable unit requires space that is difficult to find in a convenient spot without interfering with panel instruments or leg room.

While the converter draws 20 ma. at 150 volts, tests have shown that the performance is essentially unchanged with the plate input reduced to 5 ma. at 45 volts. This means, of course, that the unit can be supplied from the car-receiver power pack with no danger whatever of overloading it. Or, if you are reluctant to dig into the receiver to bring a B+ lead out, you can operate the converter from a small B battery.

## The Circuit

The circuit diagram is shown in Fig. 1. A 6AK5 is used as an r.f. amplifier, and a 6J6 dual triode as the frequency converter. Since the tuning of the converter is fixed, the circuits of the r.f. amplifier must be broadbanded to pass all frequencies in any ham band. These circuits consist of slug-cored coils tuned by the tube capacitances. However, a trimmer capacitor,  $C_3$  in Fig. 1, is included so that the amplifier grid circuit can be peaked up for the particular antenna in use, or in going from one end of the band to the other.

A common trouble experienced when a broad-



The input tuning capacitor ( $C_3$ ), the bandswitch, and  $S_1$  are in line from left to right on the front wall of the chassis. The tuning slugs for the coils may be adjusted through holes drilled in the sides of the chassis. Inside the unit, switch sections  $S_{2A}$  through  $S_{2F}$  are in line in that order from front to rear. Crystals for the oscillator are grouped between switch sections  $S_{2D}$  and  $S_{2E}$ .

**QST** for

cast receiver is used as a tunable i.f. is that strong local broadcast signals may feed in through the converter to reach the b.c. receiver input and cause interference. This effect has been minimized in this design by providing a pair of wave-traps,  $C_1L_1$  and  $C_2L_2$ , at the input. With  $C_1L_1$  tuned to the strongest signal at the low-frequency end of the b.c. band, and  $C_2L_2$  tuned to the strongest local signal at the high end of the band, the feed-through of b.c. signals will seldom be bothersome.

For frequencies above 7 Mc., the oscillator section of the converter works at harmonics of the crystal frequency. At these frequencies a circuit is used which limits the oscillator output essentially to the desired harmonic frequency. On 3.5 and 7 Mc., the crystals work at the fundamental, and the circuit is a simple Pierce,  $L_6$  being eliminated on these bands.

For the sake of simplicity in the diagram, only a single set of coils (the 14-Mc. set) is shown. Other coils and crystals are wired similarly to their respective switch points. Switch section  $S_{2E}$  is not used as an active switch, its point terminals merely serving as a most convenient tie-point strip for supporting the junction of the crystals and  $L_6$  coils. In the case of the 7- and 3.5-Mc. positions, where no  $L_6$  coils are used, the corresponding switch points are simply wired together, as indicated.

$S_1$  performs the switching necessary in shifting from ham-band to broadcast input.  $S_{1A}$  and  $S_{1B}$  shift the antenna from the converter to the b.c. receiver, while  $S_{1C}$  turns off the converter filaments.

As with a conventional superhet, the frequency of the crystal-controlled oscillator must differ from the frequency of the incoming signal by the frequency of the i.f. amplifier. In this case, the i.f. will vary from about 550 to 1550 kc. — the usual tuning range of the b.c. receiver. An ac-

• Here is a mobile converter that includes bandswitching and crystal control — features that add much to the operating convenience and received-signal stability. The standard car b.c. receiver is used as a tunable i.f., eliminating the problem of providing suitable controls and space often involved with tunable converters. Form factor has also received careful consideration. Plate power requirements are easily handled by the car-receiver supply, or even a small B battery, if the operator wants to avoid tampering with the b.c. receiver.

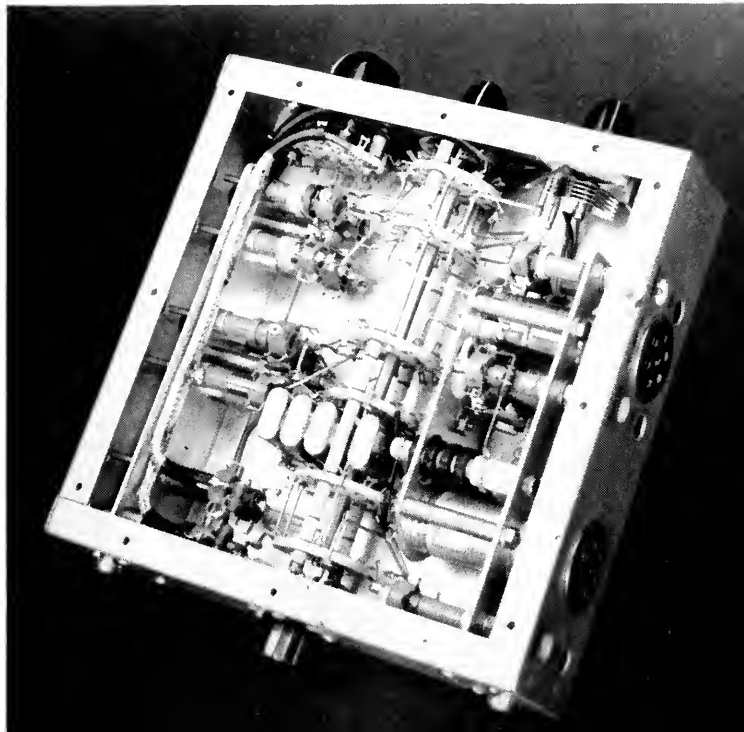
companying table shows the crystal frequency, the h.f. oscillator frequency, and the range over which the b.c. receiver must be tuned to cover each of the ham bands. The oscillator works on the low-frequency side of the signal frequency in this instance.

Since the range of the b.c. receiver is approximately 1000 kc. (1550–550 kc.), the tuning range with any single crystal is limited to 1 Mc. However, this is more than adequate for all except the 10-meter band. For full coverage of this band, two crystals are used, as indicated in the table. The two frequency ranges are from 28 to 28.9 Mc., and from 28.75 to 29.7 Mc. The 11-meter band is not normally included, but values are given so that this band may be substituted for one of the 10-meter ranges if desired.

### Construction

The converter is built into a  $2 \times 7 \times 7$ -inch aluminum chassis. The top cover (actually a bottom plate for the chassis, and not shown in the photographs) is a flat piece of aluminum measuring 7 by 9 inches. The extra inch of overlap on each side provides lips for fastening the

Connectors  $J_1$ ,  $J_3$  and  $J_2$  are mounted in that order, from right to left, on the rear wall of the converter. One-inch holes in the side wall permit the removal of tubes. The  $\frac{5}{16}$ -inch holes are for adjustment of the 28-Mc. coils.



converter to the bottom cover of the b.c. receiver by means of machine screws and metal spacers.

The aluminum bracket for the large subassembly should be made first. This subassembly is shown to the left of the bandswitch in the front view of the converter, and in the two detail photographs. The bracket is  $5\frac{1}{2}$  inches long and  $1\frac{7}{8}$  inches high, with  $\frac{3}{8}$ -inch lips bent along the bottom and the rear end. The detail photographs identify the components in this subassembly, indicating the holes that must be drilled for the tubes, coils and r.f. chokes.

When the bracket has been drilled, place it against the rear wall of the chassis, and  $\frac{3}{4}$  inch in from the left side, and mark the mounting holes in the chassis. Then slide the bracket against the left-hand side of the chassis and spot the slug-adjusting holes, and the 1-inch holes that permit removal of the tubes. The latter are the ones covered with snap-in buttons in the rear view.

The tube sockets are mounted on a piece of aluminum  $3\frac{3}{4}$  inches long overall, and  $1\frac{7}{8}$

not project and make contact with the band-switch terminals later. At the conclusion of the wiring of the subassembly, connect power leads that will run to  $S_{1C}$  and  $J_3$ , and attach a 2-inch length of wire to Pin 5 of the 6J6. The free end of the latter will later be connected to  $S_{2D}$ .

The remaining slug-tuned coils are mounted as a second subassembly on a bracket the same in size as the first, although the mounting lips must be bent in the opposite direction. The coils are arranged in three groups of four coils. The coils are centered at the corners of a  $\frac{3}{4}$ -inch square. The first square is centered on the strip and at  $\frac{5}{8}$  inch from the front edge of the strip. The second square is centered  $2\frac{1}{2}$  inches from the front edge, and the last square is centered  $3\frac{5}{8}$  inches back. At the center of each of the two squares toward the front a hole is drilled for a 1-inch 6-32 screw. A soldering lug and a  $\frac{3}{4}$ -inch metal spacer are slid over the screw before it is fastened to the bracket. The lugs are convenient grounding terminals.

Before the coils are mounted, this bracket

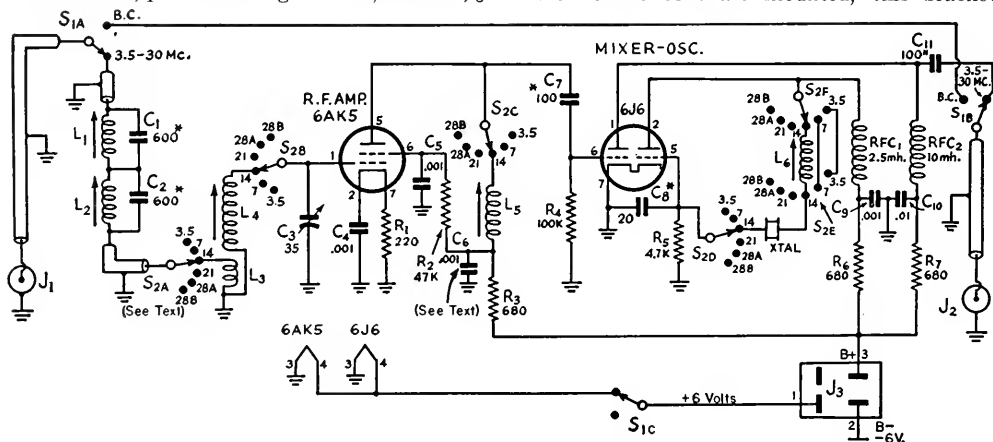


Fig. 1 — Circuit diagram of the crystal-controlled mobile converter. All resistors  $\frac{1}{2}$  watt. \*Indicates a tubular ceramic capacitor; all other fixed capacitors disk ceramic.

$C_3$  — 35- $\mu$ mf. variable (Hammarlund HF-35).

$L_1$  through  $L_6$  — See coil chart.

$J_1, J_2$  — RCA-type phono jack.

$J_3$  — 4-prong male chassis connector (Cinch-Jones P-304AB).

RFC<sub>1</sub> — 2.5-mh. r.f. choke (National R-100S).

RFC<sub>2</sub> — 10-mh. r.f. choke (National R-100S).

inches wide. This piece is spaced  $1\frac{3}{8}$  inches from the bracket and is supported from it at the four corners by long 6-32 screws with metal spacers. It has  $\frac{3}{4}$ -inch holes opposite the two inside coil forms, and  $\frac{5}{8}$ -inch holes to clear the two r.f. chokes.

Before assembling the unit, the antenna coils ( $L_3$ ) should be wound on each of the two  $L_4$  forms. Each of the North Hills coil forms has an extra set of terminals that may be used as tie points for the switch ends of the  $L_3$  windings. (By judicious use of these extra terminals, it is possible to complete the wiring of the converter without employing any additional tie points.)

Small components should be kept close to the tube-socket supporting strip so that they will

$S_1$  — 3-pole 5-position (used as 3-p.d.i.) selector switch (Centralab PA-2007 or PA-5 wafer mounted on PA-300 index).

$S_2$  — 6-pole 6-position selector switch (6 Centralab PA-18 wafers mounted on PA-302 index; see text).

XTAL — See frequency chart (James Knight type H-17).

should be placed against the rear wall of the chassis and  $\frac{3}{4}$  inch from the right-hand side and its mounting holes marked in the chassis. Then, as before, it should be slid against the right-hand side of the chassis while the slug-adjusting holes are spotted in the wall of the chassis.

The first group of coils toward the front are the r.f. grid coils,  $L_3L_4$ , and the plate coils,  $L_5$ , are in the second group. With the slug screws facing you, the 80-meter coils are at the upper left, the 40-meter coils are at the upper right, the 20-meter coils at the lower left, and the 15-meter coils at the lower right. The third group of coils at the rear include the trap coils,  $L_2$  at the upper left, and  $L_1$  at the upper right. Below are the 20-meter oscillator coil ( $L_6$ ) to the left, and the 15-

Frequency Chart for the Mobile Converter			
Band, Mc.	Crystal Freq., Kc.	Oscillator Freq., Mc.	I.F. Range, Kc.
3.5-4	2900	2.9	600-1100
7-7.3	6400	6.4	600-900
14-14.35	6700	13.4	600-950
21-21.45	6800	20.4	600-1050
26.96-27.23	6575	26.3	660-930
28-28.9	6850	27.4	600-1500
28.75-29.7	7050	28.2	550-1500

NOTE: I.f. range indicates broadcast receiver tuning range necessary for covering the associated amateur frequencies.

meter oscillator coil to the right. The antenna coils,  $L_3$ , should be wound on their corresponding grid-coil forms ( $L_4$ ) before assembling.

Only a single by-pass condenser is shown in the diagram at  $C_6$ . Actually, there are three of them. One is at the junction of the cold ends of the two 10-meter coils, one for the 3.5- and 7-Mc. coils, and one for the 14- and 21-Mc. coils.

### The Bandswitch

The bandswitch is made up from Centralab Switchkit parts as indicated under Fig. 1. The wafers are spaced as follows: index head to wafer  $S_{2A}$ — $\frac{5}{16}$  inch,  $S_{2A}$  to  $S_{2B}$ — $1\frac{1}{16}$  inch,  $S_{2B}$  to  $S_{2C}$ — $1\frac{7}{16}$  inches,  $S_{2C}$  to  $S_{2D}$ — $1\frac{1}{16}$  inch,  $S_{2D}$  to  $S_{2E}$ —1 inch,  $S_{2E}$  to  $S_{2F}$ — $1\frac{3}{16}$  inch. The tail of the bandswitch shaft should be cut off close to the last wafer, to leave space for  $J_3$ , but the two assembly screws should be allowed to extend through the rear wall of the chassis to strengthen the support. In assembling the switch, be sure to use the small fiber washers between each ceramic spacer and between the wafers and the spacers to prevent cracking of the ceramic. All wafers should be placed on the assembly rods so that the rotor or "arm" terminal is the second terminal to the left of the upper assembly rod, as viewed from the front.

The crystals can be soldered to the switch contacts after the switch is mounted in the chassis. They are placed between  $S_{2D}$  and  $S_{2E}$ . In the rear-view photograph, the crystals, left to right, are for 3.5 Mc., 7 Mc., 21 Mc., and the high end of the 28-Mc. band. The crystals for the 14-Mc. band and the low end of the 10-meter band are placed horizontally, one above the other, against the bottom of the chassis. They are hidden by the group of three lower-frequency crystals. Prongs taken from an octal socket and slid over the crystal-holder pins are a good means of connecting the crystals to the switch wafers.

The three controls are lined up along the center line of the front edge of the chassis, with the antenna trimmer,  $C_3$ , to the left, the bandswitch at the center, and  $S_1$  at the right. The two outer controls are centered 2 inches from the band-

switch shaft. In the final assembly these should be mounted first.

Shielded phono jacks (RCA type) are used for  $J_1$  and  $J_2$ , and are placed near the two rear corners of the chassis. In the rear view, the antenna jack is at the right and the output jack at the left. The fiber mountings of these jacks will need to be clipped off so that they will fit between the chassis and the subassembly brackets. These should be mounted next, and the coax leads run to  $S_{1A}$  and  $S_{1B}$ , keeping the leads along the bottom corners of the chassis.

Next the two subassemblies can be mounted and connections made to the bandswitch. Most of these connections can be made most easily with bare No. 16 wire. In addition to the connections shown in the diagram, the bandswitch terminals immediately to the left of the upper tie rod (as viewed from the front) on  $S_{2A}$  and  $S_{2B}$  should be connected together, and then to the ground terminal at the socket of the 6AK5. This grounds the inactive  $L_3$  and  $L_4$  coils.

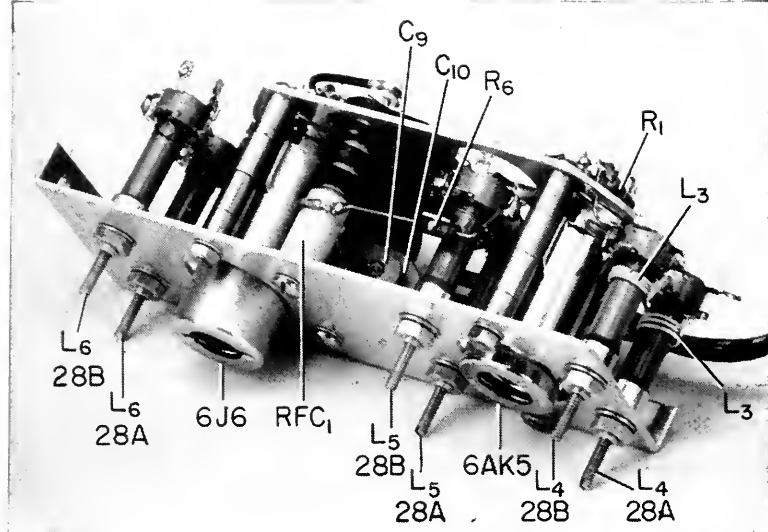
As a last operation, the power leads are brought to the power supply connector,  $J_3$ , and soldered to the terminals.

### Power Supply

The converter requires 0.625 ampere at 6 volts for the heaters, and anything between 5 ma. at 45 volts to 20 ma. at 150 volts for the plate supply. This can be taken most conveniently from the car b.e. receiver by connecting two leads to an audio-output-stage socket. It is preferable to take the filament voltage from this point, rather than from the car wiring, so that advantage may be taken of any battery-line filtering that may be built into the b.e. receiver. Plate voltage should be taken from the screen terminal. This voltage will usually be about 200, and can be dropped down to the desired value with a series resistor. A 12,000-ohm 2-watt resistor will usually be about right. This resistor should drop the voltage from 200 to approximately 75 at about 10 ma. The hot filament and plate-supply leads, plus a

Coil Chart for the Mobile Converter					
Band	Turns <i>L</i> <sub>3</sub>	Ind. Range, $\mu$ h.		Type No.	
		<i>L</i> <sub>4</sub> <i>L</i> <sub>5</sub>	<i>L</i> <sub>6</sub>	<i>L</i> <sub>4</sub> <i>L</i> <sub>5</sub>	<i>L</i> <sub>6</sub>
3.5-4	30	64-105	—	120-G	—
7-7.3	8	18-36	—	120-E	—
14-14.35	4	5-9	18-36	120-C	120-E
21-21.45	3	3-5	5-9	120-B	126-C
26.93-27.23	3	2-3	3-5	120-A	120-B
28-28.9	3	2-3	3-5	120-A	120-B
28.75-29.7	3	2-3	3-5	120-A	120-B

NOTE: *L*<sub>1</sub> and *L*<sub>2</sub>, Fig. 1, are Types 120-F (36-64  $\mu$ h.) and 120-E, respectively. Series 120 coils are obtainable from North Hills Electric Co., Inc., 203-18 35th Ave., Bayside 61, New York. *L*<sub>3</sub> is wound with fine magnet wire at grounded end of *L*<sub>4</sub>.



This view of the sub-assembly shows the 1-inch holes which permit removal of the tubes. The mounting bracket measures  $1\frac{7}{8}$  by  $5\frac{3}{8}$  inches and has  $\frac{3}{8}$ -inch mounting lips at the bottom and the left ends, as seen from this angle.

ground lead, can be brought to a connector mounted on the b.c. receiver, or run in the form of a cable terminated with a female plug that fits the connector at the rear of the converter. Shielded wire should be used for the cable.

### Antenna Coupling

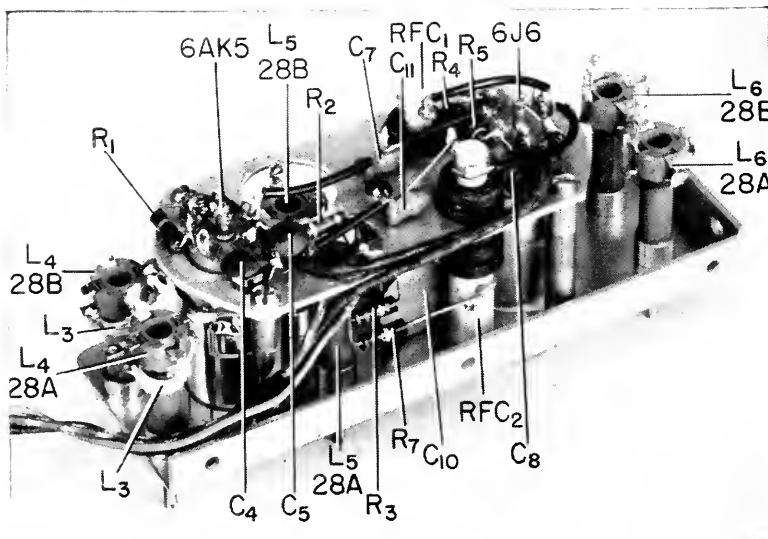
With a small antenna, such as a mobile whip, tight coupling to the antenna is essential for best signal response. It is also important in avoiding regeneration in the r.f.-amplifier stage. Therefore, especially when the antenna is a small one, it should be resonant. This is usually the case in a mobile installation where the antenna must be made resonant for transmitting. If a signal generator is used for preliminary adjustment, it should be one having low-impedance (about 50-ohm) output. Here at the ARRL lab, initial tests were made with a signal generator. Final tests were made with a standard 10-meter whip loaded with a Johnson "Whipload-6," preadjusted to each

band. The bandswitching feature of this loading unit was most convenient in changing back and forth between bands along with the converter.

### Adjustment

The high-frequency oscillator should be checked first, listening on a communications receiver at the oscillator frequencies listed in the table. No adjustment of the oscillator is necessary at 3.5 and 7 Mc., but at the higher frequencies the slugs of the  $L_6$  coils must be adjusted for most stable output at the proper harmonic frequencies. Set the receiver to the desired frequency and adjust the slug until the oscillator signal is heard. To make sure that the oscillator is crystal-controlled, jar the converter. If the signal is crystal-controlled, no amount of jarring should change the frequency. If it is not crystal-controlled, the slug should be adjusted carefully until the oscillator locks in with the crystal.

(Continued on page 120)



This assembly supports the tubes, the 28-Mc. coils, and most of the small components of the crystal-controlled converter. The support plate for the tube sockets has rounded ends to clear coils  $L_4$  and  $L_6$ , and a pair of  $\frac{3}{4}$ -inch holes to provide access to the terminals of the amplifier plate coils. The wire leads leaving the unit at the left connect to  $S_{1B}$ ,  $S_{1C}$ , and Pin 3 of  $J_3$ , as shown by Fig. 1.



# A Cubical Quad for 20 Meters

## Reviving a Neglected Type of Beam

BY S. B. LESLIE, JR.,\* W5DQV

• The cubical quad enjoyed brief popularity when "10" was in its glory, but has practically disappeared along with sunspots and ten-meter activity. The author finds it highly satisfactory on 14 Mc. and offers reasons why it is worth serious consideration if you're thinking of putting up a beam.

**I**N pursuit of our hobby we occasionally run across a piece of equipment that performs in a satisfactory manner, is easy to build, simple to adjust and low in cost, yet for some unknown reason is neglected and forgotten by the majority of amateurs. Such is the case of the cubical quad antenna. A few years ago, when 10 meters was open, the quad enjoyed considerable popularity. Many amateurs reported that it gave them results equal to, and in many cases superior to, the conventional 3-element Yagi, some claiming gains as high as 10 to 11 db.<sup>1, 2</sup> Measurements at ARRL headquarters gave the quad a gain of 7 to 8 db. over a reference dipole antenna, a gain equal to that of a good three-element beam.<sup>3</sup>

As 10 meters faded out so did the quad; the fellows who had been so enthusiastic about it failed to carry through and use it on the lower frequencies. Comments received over the air now indicate that many hams do not know what the quad is or what it is capable of doing. Those who are familiar with it seem surprised that a practical one for 20 meters could be built and all assume it would be a monstrous affair. Actually, the quad occupies less space and appears smaller than a three-element beam.

The cubical quad consists of a radiating element and a parasitic reflector, usually spaced 0.15 or 0.20 wavelength, both radiator and reflector consisting of square loops one quarter wavelength on a side, making a total of one wavelength around the loop. This configuration can be arranged either as shown in Fig. 1A or Fig. 1B, that shown at 1B giving slightly higher gain.<sup>3</sup> In some installations the reflector is made

a little longer than the radiator as in Yagi beam construction, in others it is made the same length as the radiator. In either case, provision is made for tuning the reflector by means of a shorted stub or variable condenser in order to obtain optimum phasing. These square loops may be thought of as two half-wave elements stacked one quarter wavelength apart with their ends bent to connect them together, hence a lower angle of radiation is obtained than would be expected from a simple two-element beam. Many of the early versions used two-turn loops for radiator and reflector but this served no purpose except to raise the feed-point impedance.<sup>3</sup>

### Performance Data

The amateur literature has very little to say regarding the mode of action of the quad and anyone interested is urged to read the articles mentioned above. Since this antenna seemed to have several advantages over the Yagi and as very little experimental work had been reported on it, a scale model for the 50-Mc. band was built to try to determine some of its characteristics. All measurements were made with the center of the array one wavelength above ground and the instruments used were a Heathkit AM-1 antenna impedance meter, a Millen grid-dip oscillator and a homemade field-strength meter. The test signal was furnished by a transmitter feeding into a dipole elevated one wavelength above the ground and located three wavelengths from the antenna being tested. All measurements were

\*% Leslie-McCauley Clinic, 122 East 3rd St., Okmulgee, Okla.

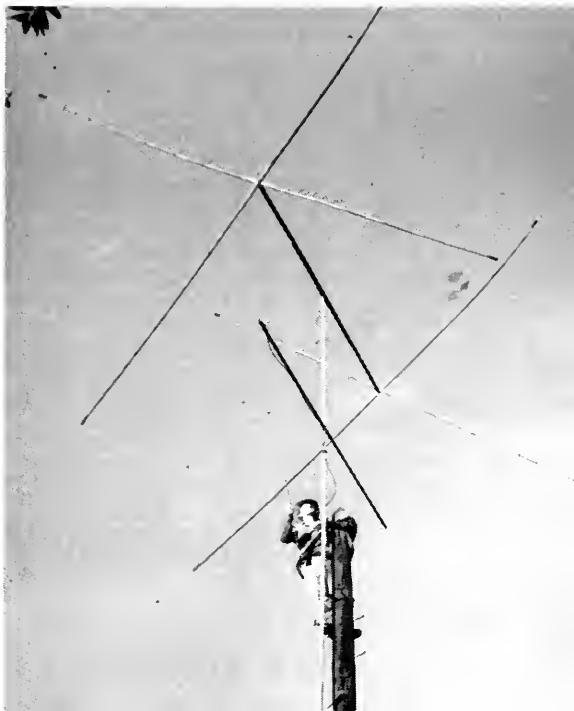
<sup>1</sup> The CQ Staff, "Cubical Quad, Topic Number One," CQ, December, 1948, p. 37.

<sup>2</sup> Hoffman & Middleton, "Constructing the Cubical Quad," CQ, June, 1949, p. 11.

<sup>3</sup> "The Quad Antenna," QST, November, 1948, p. 40.



W5DQV adjusting the phasing stub on his 20-meter quad. The main supports are bamboo fishing poles.



double-checked on two different occasions to make them as accurate as the instruments would permit.<sup>4</sup> The results are tabulated below:

Radiator alone	Imp.	110 ohms
	Gain over dipole	2 db.
Reflector spaced 0.20	Imp. of radiator	75 ohms
	Gain over dipole	10 db.
Reflector spaced 0.15	Imp. of radiator	65 ohms
	Gain over dipole	8 db.
Reflector spaced 0.10	Imp. of radiator	45 ohms
	Gain over dipole	8 db.
Director spaced 0.20	Imp. of radiator	50 ohms
	Gain over dipole	5 db.

The gain figures seem high but they are the actual readings obtained. The radiating element alone, without reflector or director, gave a consistent gain of 2 db. over a well-matched and

and reflector. Such a beam might prove considerably better than a three- or four-element Yagi. Time limitations prevented investigating these possibilities, but it is hoped that the above experimental work will stimulate more work on the quad by other amateurs. This beam is worth much more attention than it has received in the past.

The 20-meter quad here at W5DQV has created considerable interest, nearly half the stations contacted asking for more information about its operation and construction. After fourteen months' operation on 20 c.w., this antenna has proven its worth as it has given results equal to and often superior to the three-element wide-spaced beam it replaced. It is definitely smaller than the usual three-element beam, having a

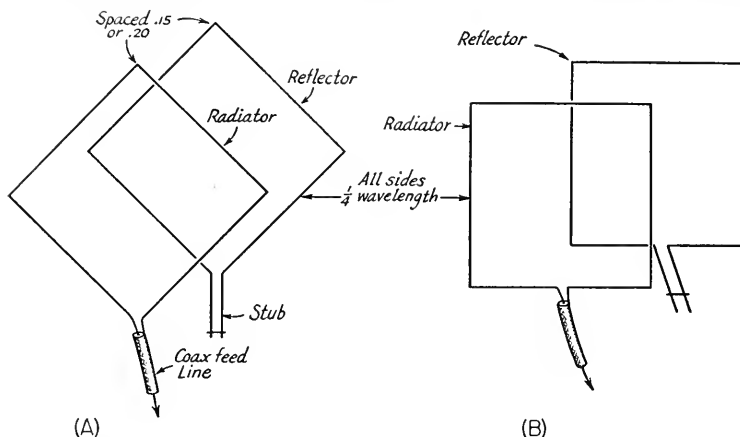


Fig. 1 — Two different arrangements of cubical quad antennas.

trimmed dipole. This does not agree with the published figures for a square loop; nevertheless, this 2-db. gain was obtained on two different occasions, using different loops and different dipoles, all grid-dipped to the correct length. Disregarding this 2-db. gain of the square loop, the 0.20 spaced quad still gives a gain of 8 db., a very respectable gain indeed.

A field pattern taken with the reflector at 0.15 is shown in Fig. 2. A pattern taken at 0.20 showed a similar outline but with somewhat greater attenuation of the back lobe.

The radiation from the sides of these test beams and the one used on 20 meters was remarkably low, the field-strength meter indicating almost zero off the sides. On-the-air tests with the 20-meter quad showed a 45-db. front-to-side ratio and 25-db. front-to-back ratio. A square element tuned as a director and spaced 0.20 wavelength gave a gain of 5 db. over the dipole, which brings up the interesting possibility of a three-element quad using 0.15 or 0.20 spacing for both director

"wing span" of only 16 feet 9 inches as compared to 33 feet, a boom length of only 12 feet as compared to 20 or 24 feet, and as described here, a weight of about 20 pounds. Yet this is a full-sized beam capable of giving full-sized performance; there are no shortened elements and there are no loading coils to absorb power. It is easily turned by a TV rotator, is constructed of readily obtained materials, and can be built, put in place and tuned in one or two week ends.

### Construction

Most of the details of construction can be seen in the photo and drawings. It was built to be as light as possible and while it does whip some in the wind, this does not seem to cause any notice-

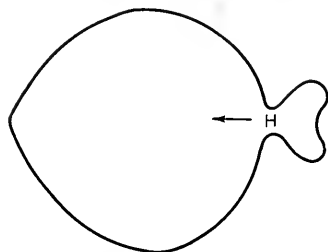


Fig. 2 — Field-strength pattern of 50-Mc. cubical quad with 0.15 spacing. The broad nose and sharp dips off the sides are also very noticeable in on-the-air tests with the 20-meter quad.

<sup>4</sup> Antenna measurements of any type tend to be tricky, even with elaborate and accurately-calibrated equipment, because of the difficulty of detecting and eliminating stray effects which sometimes are of the same order of magnitude as the quantities under investigation. Results such as those tabulated here (and other similar tabulations of antenna performance figures) are of considerable value, practically, if it is kept in mind that they are necessarily approximations, useful as a guide but not to be taken as literally as, say, the reading of a good quality d.c. voltmeter. — Ed.

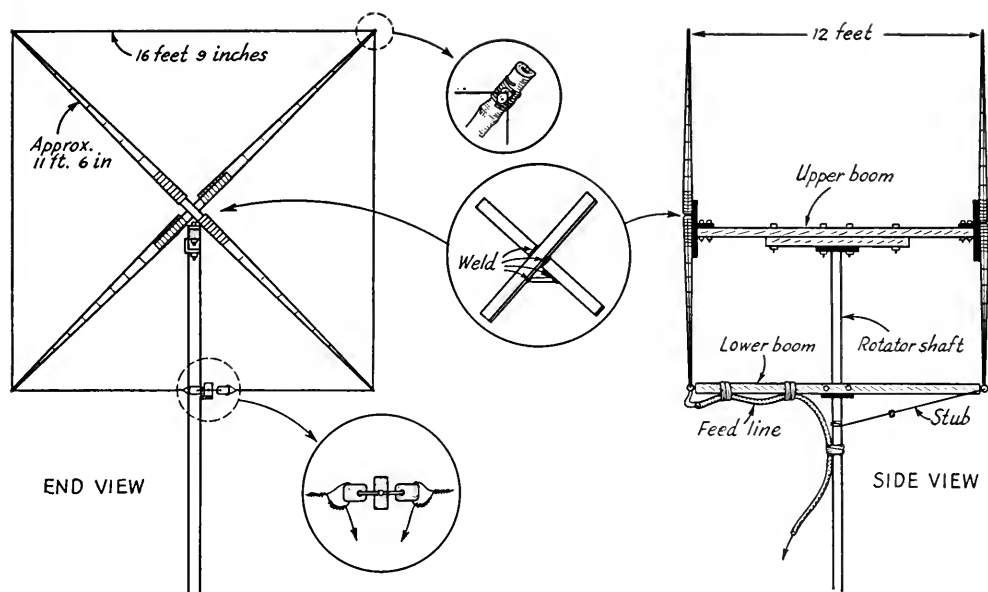


Fig. 3 — End and side views of 20-meter quad. Upper insert shows method of fastening antenna wire to support arms. Center insert shows construction of support-arm mounting bracket. Lower insert shows method of attaching feed line and stub to the center insulators. Two small egg insulators are used, fastened to end of lower boom as shown with a small nail.

able change in loading or on received signals. There is nothing critical in the construction except the length of the wire elements, and no doubt many will devise better ways to build and support this antenna. One of the quads built by a local ham used 1 × 2-inch pine for the support arms but this beam was much too heavy and blew down in the first light wind. The support arms shown in the drawing are ordinary bamboo fishing poles about 16 feet long, with the butt ends wrapped with friction tape to prevent the metal mounting bracket and wire from biting into the bamboo. These arms are fastened to the mounting brackets as shown in Fig. 3 with several turns of No. 14 galvanized wire, and the far ends are not trimmed until the antenna wire has been fastened in place. Two mounting brackets and eight bamboo support arms are required. The mounting brackets serve to hold the arms in place and to fasten them to the end of the boom. These brackets are made by welding two 24-inch lengths of 1-inch angle iron together back to back to form a large "X" 90 degrees between legs, and welding a 5-inch length of 1½-inch strap iron between two of the legs to fasten the "X" to the boom end. The arms are assembled and the antenna wire is fastened in place before attaching the brackets to the boom.

Many amateurs will raise their eyebrows at the idea of using fishing poles in construction of an antenna, but if the poles are well treated with a weatherproofing compound they will last several years. Weatherproofing compounds are available at all lumber dealers. This antenna has been up for over a year in all sorts of weather and as yet shows no signs of wear. Be sure to get straight poles with no splits in them. No insulators are

necessary, the poles themselves acting as long insulators. The antenna shown in the photo uses plastic insulators but subsequent beams have shown these to be unnecessary. The easiest way to mount the antenna wire on the arms is to lay a long length of wire on the ground and mark it at quarter-wave intervals, in this case 16 feet 9 inches, and use these marks to indicate where the wire fastens to the pole. Fasten loosely at first as it will be necessary to slide these joints up and down the poles a little until all four sides of the

(Continued on page 122)

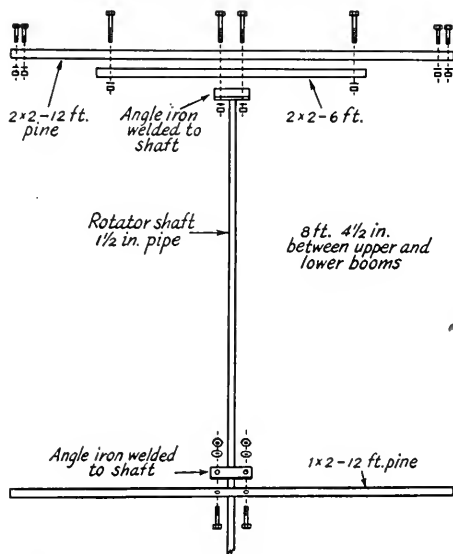


Fig. 4 — Assembly of booms and rotator shaft. All bolts are ¼ inch.

# A Discussion of Receiver Performance

## *Some Fine Points and Unsolved Problems of Receiver Design*

BY E. W. PAPPENFUS,\* W0SYF

• Here is an article on receivers that anyone with the slightest interest in "why" should not pass up. It won't tell you how to build anything, unless you read carefully between the lines, but it will certainly help you to understand some effects that may have been a mystery up to now.

SINCE good communication superheterodyne receivers have been available for about twenty years, it is surprising that there is anything left to discuss about this line of equipment. However, the large number of letters that are written to the manufacturers questioning receiver performance points to the need for a discussion of the action of a receiver under certain conditions. These include weak-signal reception as well as performance in the presence of a very good signal. Many hams feel that there is no need to miss a QSO because a signal is weak. They feel that if a signal can't be read, it is strictly the fault of the set design. At the same time, it is hard for many radio operators to understand why a receiver cross-modulates and blocks when the kilowatt station next door comes on the air. As you may guess, this is a discussion of the reasons why a receiver is not all the amateur expects and perhaps also a defense of receiver design.

The subjects to be discussed include receiver sensitivity, signal-to-noise ratio, noise figure, cross-modulation and blocking. It is self-evident that a receiver for amateur use, and particularly for DX, must have a great deal of inherent amplification. The ability of a receiver to make a lot of sound in the loudspeaker with a very weak signal is called "sensitivity." High sensitivity in a receiver is a necessary, but not sufficient, definition of weak-signal receiver performance. "Signal-to-noise ratio" is also very important.

It is not quite as apparent that a good communications receiver must be free from overloading or cross-modulation when strong signals are present. These undesirable effects are generally overlooked in the general confusion and congestion of the present-day amateur bands. It must be admitted that the modulation splatter blamed on the local amateur at the other end of the band is sometimes generated in the receiver. It is unfortunate that a receiver designed for very good weak-signal performance should have difficulty with extremely strong signals. This, however, is the case, and it is an area in which

an engineering compromise must be reached. Like most compromises, it is open to argument, and there is no completely clinching evidence to prove that the receiver design was right. The compromise involves r.f. stage gain, a.v.c. characteristics, r.f. selectivity, type of r.f. tubes, type of mixer tube, and mixer noise. With all of these balancing factors it may be seen that it is not an easy decision for the set designer.

The signal-level chart for a 75A-3, shown in Fig. 1, will help to explain some of the items discussed previously. In developing this chart, a signal generator was set for a convenient level at the antenna and then moved back, stage by stage, toward the diode detector. The signal generator output was adjusted to hold constant diode-load voltage at each point in the circuit and, of course, the frequency was changed appropriately at the i.f. amplifier. The signal generator was then returned to the antenna terminals and increased to simulate a stronger signal. Again the signal generator was moved toward the second detector holding diode-load voltage constant. Moving the signal generator along, stage by stage, is equivalent to a voltage measurement at that point. A family of curves was generated, as shown, that gives a complete picture of receiver performance with various r.f. input levels. A change in gain is represented by a change in slope of the curve. Note the constant gain of antenna link to first r.f. grid, and the reduction in gain due to a.v.c. in the first r.f. stage and the i.f. amplifiers. It is clear how the gain of the five controlled stages changes to hold the diode-load voltage almost constant.

### **A. V. C.**

The basic function of automatic volume control in a receiver is to keep the diode-load voltage constant and thus hold constant audio output for changing signal levels. This is apparent from Fig. 1, because the diode-load voltage does not rise appreciably above 8 volts as the signal level is changed from 1.5 to 100,000 microvolts. This constancy of receiver output voltage does not tell the whole story, however. It is important to "delay" the application of a.v.c. voltage until a suitable signal-to-noise ratio is reached. This allows the receiver output to increase in a linear manner with input signal level so that receiver noise is rapidly overcome. In the 75A-3 the a.v.c. does not become effective until the input signal is about 1.5 microvolts. In addition, some sets delay the application of a.v.c. voltage to the r.f. stage until even higher signal levels are reached. This also contributes to a linear improvement in signal-to-noise ratio as the input signal is

\*% Collins Radio Company, Cedar Rapids, Iowa.

increased above the a.v.c. threshold. As an example of delayed a.v.c. action, if a 2-microvolt signal gives a 10-db. signal-to-noise ratio, then a 20-db. increase to 20 microvolts will give a 30-db. signal-to-noise ratio. A 10-db. signal-to-noise ratio provides a good readable signal, but a signal with less noise is more enjoyable and less tiring to the operator.

By dividing the a.v.c. voltage applied to the r.f. stage in the 75A-3, suitable action is obtained without separately delaying the r.f. stage a.v.c. voltage. Since a sharp-cut-off tube is used in the 75A-3 r.f. stage, there is a secondary reason to limit a.v.c. voltage to this tube. A 6BA6 is a better tube for a.v.c. action, but unfortunately it is a very noisy tube compared with the 6CB6 that is used.

Manual gain control in the 75A-3 operates on the a.v.c. line, just as the automatic volume control does. This means that the gain distribution is proper for any reasonable setting of the manual gain control. It is possible to degrade the signal-to-noise ratio with manual gain control if too much gain-adjusting action is applied to the r.f. stage, so that mixer noise is proportionally larger. Noise tests on a receiver should be made at various signal levels to insure that manual gain control is applied to the proper stages.

### Weak Signals

It is possible to put a large amount of over-all amplification in a receiver because the amplification at a given frequency can be held to a manageable level through the use of the superheterodyne principle in single- or multiple-conversion (75A) schemes. The gain from antenna to loudspeaker in a typical communications receiver may be as great as 10 million, but all this gain does not permit the amateur to copy a weak DX station unless the noise contributed by the antenna-coupling circuit, the first r.f. tube shot noise, mixer noise, etc., is held to a low value. That is the reason receiver performance is specified by *signal-plus-noise-to-noise ratio*. A signal generator modulated 30 per cent at 400 c.p.s. (to simulate a speech signal) is fed into the receiver antenna terminal. The proper resistor is placed in series to match the receiver input impedance. The signal generator output is increased until there is a 10-db. increase in the reading of an output meter connected to the receiver audio over

the level present when the modulation is switched off. This means that the signal (modulated portion) plus noise is 10 db. stronger than the noise. A signal 10 db. stronger than the noise level is acceptable for voice communications, hence the justification for this value. A good c.w. operator can copy signals with a lower signal-to-noise ratio, but the lower the signal-to-noise ratio, the more expert the operator must be.

It is dangerous to generalize, but it is possibly safe to say that any amateur receiver with a 10-db. signal-to-noise ratio at from 1 to 3  $\mu\text{v.}$  is in the high quality class. Noise-figure tests<sup>1</sup> of receiver performance make use of a noise diode and are the only real means of comparison between receivers of different bandwidth, because receiver noise voltage varies proportionally to the square root of the bandwidth. A narrow-band receiver should not be compared directly with a wide-band set. Noise figure expresses the ratio in db. between the noise level of the receiver under test to a so-called perfect receiver in which all noise is assumed to be generated in the dummy antenna due to its thermal noise. (See Appendix.)

It can be shown that a perfect receiver with 6-kc. bandwidth and 100-ohm input would require 1.4  $\mu\text{v.}$  to have a 10-db. signal-plus-noise-to-noise ratio. This receiver when operated with a dummy antenna matching the receiver input impedance has a 3-db. noise figure. It is theoretically possible to improve the noise figure by mismatching the antenna, but this is not important from a practical standpoint in the ham bands from 10 to 160 meters, because the antenna impedance cannot be predicted accurately. Again a compromise in design results, and a 100-ohm input impedance was selected for

<sup>1</sup> Goodman, "How Sensitive Is Your Receiver?" *QST*, Sept., 1947.

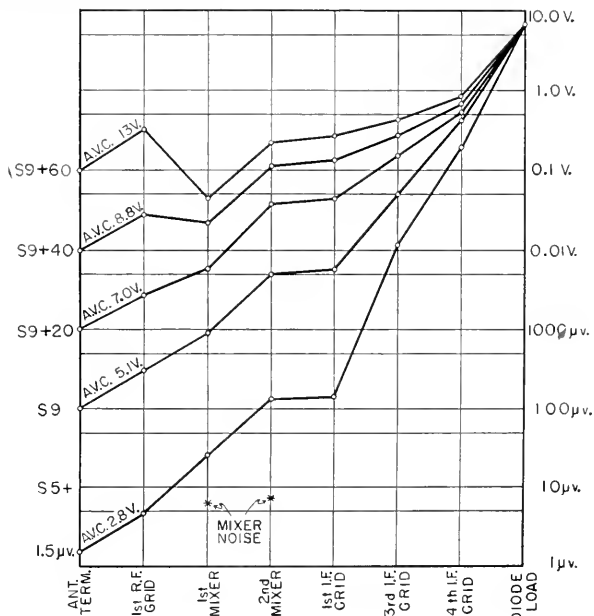


Fig. 1—A signal-level chart of the 75A-3 receiver, showing the signal levels that exist through the receiver for various input signals and bias voltages.

the 75A-3. Since signal generators are generally available and noise diodes are not, it is customary to use the signal generator method with 10-db. signal-plus-noise-to-noise as the standard of comparison between receivers. Incidental frequency modulation in the signal generator can cause errors particularly at high frequencies and should be guarded against.

Noise in a receiver results from so-called thermal-agitation noise in the input circuit, shot noise, mixer noise and amplifier noise. Pentagrid mixers are particularly noisy tubes, but they are advantageous because of the ease with which the oscillator can be fed into the mixer and the freedom from coupling of oscillator voltage to the signal grid.

If enough gain-producing elements precede the mixers, then the mixer noise can be neglected. Since the greatest gain exists from the grid circuit of the first r.f. amplifier to the receiver output, it is logical to expect this noise to be louder than any other receiver noise. This is not always true, but in a properly designed receiver the input noise makes the greatest contribution to over-all receiver noise. This can be demonstrated by peaking the grid circuit, with

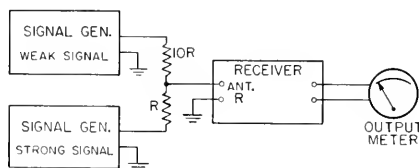


Fig. 2 — The cross-modulation effects in a receiver can be measured by using two signal generators connected as shown here.

a resistor of proper value across the antenna terminals. A rise in receiver noise output when the first r.f. tank circuit is tuned compared with the completely detuned condition indicates the proper gain distribution. A drop in noise level as the first r.f. tube is removed also shows that the mixer noise is not an important factor in over-all receiver signal-to-noise ratio. Two r.f. stages are generally not required to approach the ideal weak-signal receiver performance, because a single stage using a high-transconductance tube will amplify the signal sufficiently to override the mixer noise. The chart of Fig. 1 shows the equivalent noise present at the mixers. The gain here appears sufficient to override completely the mixer noise with 1.5- $\mu$ v. input.

If this peaking effect of noise with antenna terminals properly loaded with a resistor is not found, then the antenna coil gain, antenna circuit  $Q$  or r.f. amplifier gain should be adjusted until the receiver noise is dominated by the receiver input noise. Only then can the operator say that his receiver is able to hear the weakest stations. This actually is a rather theoretical consideration because of the large amount of static and interference prevalent, except perhaps

on the 10-meter band. When the weakest reading on the S-meter across the entire 20-meter 'phone band is S6 to S9, because of a solid array of strong signals, obviously receiver noise is not then the limiting factor. Receiver bandwidth is much more important. Atmospheric and manmade static on the antenna also limit the signals that can be copied. Only rarely can the full signal-to-noise capabilities of a receiver be used. This can be checked by tuning to an unused portion of the band (that's a joke, son) and then removing the antenna from the receiver and replacing it with the equivalent resistance. If the receiver noise output drops, then the antenna noise is the limiting factor and not the noise developed within the receiver.

### Strong Signals

For the reception of strong signals, an additional receiver requirement is added. Radio-frequency voltages applied to any stage of the receiver must not exceed the bias for that stage with any signal ordinarily encountered. Fortunately, the receiver a.v.c. voltage increases the bias applied to each stage and at the same time reduces the gains through the receiver when strong signals are tuned in.

Five controlled stages are used in the 75A-3 a.v.c. circuit. By removing one controlled stage or by reducing the proportion of a.v.c. voltage fed to a stage, it is possible to change the receiver gain distribution. The set designer has this "handle" by which he can set the gain curve to the desired shape. The curves of Fig. 1 show sufficient r.f. gain adjustment so that the mixers are protected from large signal voltages for any signal within the range of the S-meter. Because mixers are somewhat critical in the application of bias, the first and second mixers are omitted from the controlled circuit and set at a suitable bias by voltage drop across a cathode resistor. The exact gain distribution within a receiver is not critical within the limitation that all stages must be held below the overload region with the highest signal level ordinarily encountered.

Strong signals outside the passband can reduce the set gain if rectified grid current flows in any stage which can charge up the a.v.c. line. A decoupling resistor and a low-resistance a.v.c. line minimize this effect.

Representative voltages for 0.5-volt input are 1.5 volts on the r.f. grid and 1.1 volts on the second mixer grid. At these voltage levels the mixer draws grid current and its conversion gain is reduced. The overload point for a receiver is defined as that input level at which a 6-db. drop in audio output occurs compared with the maximum audio output as the input signal is increased. Overload point for the 75A-3 is at 1.4 volts. A small amount of grid current in the mixer is not serious, as indicated by the fact that the overload point is well above the input at which the peak r.f. grid voltage applied to the second mixer exceeds its bias.

All s.s.b. operators will cry out loudly at the above statement. It is possible to tolerate grid current in a receiver mixer because the performance standards are so much lower than in linear amplifiers. In a s.s.b. transmitter it is desirable to keep intermodulation products down 30 db. Harmonic distortion of the signal in a receiver can be tolerated if it is 10 to 20 db. below the signal level. This explains the ability of the receiver mixers to operate satisfactorily with small positive grid voltages.

For the reception of weak signals described earlier, it is desirable to have as much gain as possible ahead of the mixers. This would insure that the signal level would be strong enough to override completely the noise from the pentagrid mixers. However, from the standpoint of strong signals, it is desirable to have low amplification until the selectivity of the receiver is effective. This would insure that only signals in the i.f. passband would tend to overload the set and these could be more readily accommodated by the high a.v.c. bias and gain control that is effective in the i.f. amplifier. These requirements for no amplification ahead of selectivity for strong signal reception and high gain in the antenna circuit and r.f. stage for weak signal reception are in direct conflict. It is fortunately possible to make an engineering compromise that will accommodate the majority of operating situations which confront the amateurs. Weak signals can be handled by using just enough r.f. stage gain to override the mixer noise by about 6 db. or slightly more.

### Cross-Modulation

When the receiver is tuned to a weak signal, and a strong signal is present outside the i.f. passband, then a different condition prevails than in the strong-signal case outlined above. There is very low a.v.c. bias generated to protect the grids of r.f. and i.f. amplifiers from grid current and only moderate gain reduction to prevent strong signals from stage to stage in the receiver.

The only gain-reducing elements present are a small amount of a.v.c. bias generated by the desired signal, and the selectivity of the r.f. and variable-i.f. coils in double-conversion receivers. The selectivity of these coils determines the r.f. voltage applied to mixers and i.f. amplifiers. With very large signals applied to any stage of the receiver, nonlinear operation causes modulation components of the strong signal to appear on the weak signal. This, in effect, means that strong 'phone signals *outside* the selectivity curve of the i.f. amplifier can still be heard. The term "cross-modulation" has been applied to this effect. Cross-modulation in a receiver is measured by a laboratory set-up as shown in Fig. 2. Two signal generators are used to simulate the two signals. One signal generator feeds the receiver through a resistor equal to the input impedance while the other signal generator feeds through a resistor of ten times the input impedance. The resulting impedance is then very close to the matching value. The signal generator feeding

through the large resistor is set for a value of r.f. that will produce an antenna terminal signal of, say, 10  $\mu$ v. (approximately S6) at receiver center frequency. The audio output is measured and signal generator modulation is removed. The second signal generator is then turned on and adjusted for 30 per cent modulation. At various frequencies near the receiver center frequency the r.f. level from the second signal generator is increased until the receiver audio output is 10 db. less than that measured with the first signal generator. A plot of these values for the 75A-3 operating at 4.0 Mc. is shown in Fig. 3. Adjacent signals at S9 + 40 db. can interfere if they are closer than 15 to 20 kc. from the desired signal. Approximately 50-kc. separation is required for signals that are 60 db. above S9. The cross-modulation curve of Fig. 3 is an inverse composite of the receiver input selectivity. The lower part of the curve is determined by the selectivity of the receiver circuits to the second mixer grid and the upper part of the curve is shaped by the selectivity

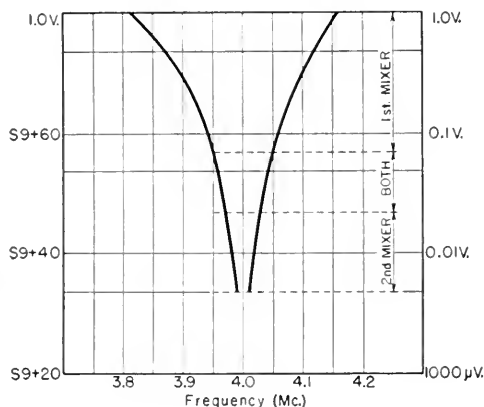


Fig. 3 — The cross-modulation characteristic of the 75A-3 receiver, with the receiver tuned to 4.0 Mc.

to the first mixer grid. The r.f. stage is never responsible for cross-modulation below 1 volt r.f. on the antenna for a 10- $\mu$ v. desired signal level. The portions of the curve at which the first and second mixer respectively contribute to the cross-modulation are indicated. A portion of the curve entitled "both" is a transitional area in which both mixers contribute to cross-modulation.

The application of a.v.c. voltage to the r.f. stage reduces its gain and helps protect the subsequent stages from excessive voltages. The matter of cross-modulation characteristics of an r.f. tube is extremely complicated, so just taking a given tube and applying a.v.c. bias is not the whole answer. There is no substitute for a large number of cross-modulation tests to determine proper r.f. stage conditions. There does not seem to be a receiving tube available that possesses the

(Continued on page 124)

# A Simple Rig for Six-Meter Mobile

*A Compact Transmitter That Is Easy on Both Pocketbook and Battery*

BY R. J. CARPENTER, \* W3OTC

• In at least two respects the 50-Mc. band is ideal for mobile operation. The average car radio whip is the right length, and low power will do the job well enough so that nothing in the way of special batteries or generators is required. Here's a 6-meter rig compact enough for steering-post mounting. It uses only two tubes, and will work nicely on a small receiver-type vibrator supply. You can build it for as little as \$21.00, complete; even less if you shop for bargains.

PERHAPS more people would go mobile if they didn't have to drill holes in their cars, bedeck them with special antennas, and install space-consuming boxes of gear that require something approaching Hoover Dam's power capacity. The 50-Mc. band is a big help in these problems. No special antenna mounts are needed, for the standard 54-inch broadcast whip is a respectable antenna system at 50 Mc. And the nature of 6-meter operation is such that a moderate amount of power works out surprisingly well.

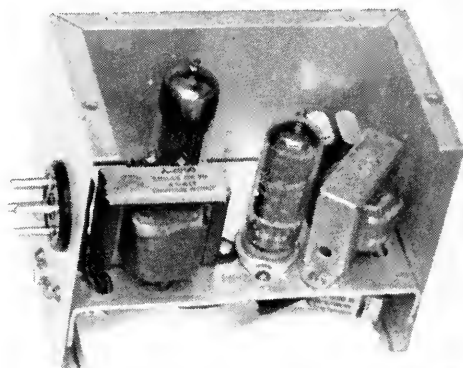
A simple converter can be built that will give entirely satisfactory performance on 6. This article will describe a transmitter that should fill the bill on the counts of simplicity, small size, low total cost and low power drain. It is a complete 6-meter 'phone rig, running 7 watts input, built in a 3 × 4 × 5-inch box. Its total cost is

\* 1812 Arcola Ave., Silver Spring, Md.

<sup>1</sup> *The Radio Amateur's Handbook*, 1953 edition, p. 386.

about twenty-one dollars, including crystal and tubes.

As may be seen from the diagram, Fig. 1, the circuit is extremely simple. The basis for this lies in the use of 50-Mc. third-overtone crystals. These high-frequency rocks are no harder to use than their lower-frequency brothers, and their relatively high price is offset by the simplification



Interior of the W3OTC 50-Mc. mobile rig. Modulator tube and microphone transformer are at the right, modulation transformer and r.f. tube at the left.

resulting from their use. (I bought mine at \$1.50 each, but figured the crystal at \$7.00 in the cost estimate above.) Suitable 50-Mc. crystals can now be obtained from most of the better manufacturers.

## Circuit Details

The first section of a 12BH7 is operated as an overtone oscillator at 50 Mc.<sup>1</sup> The plate voltage to this stage is held down by a large resistor, to help reduce the crystal current. Developing sufficient drive for the final does not seem to be a problem. Switching for two crystals is provided, though some retuning may be desirable if the frequency shift is more than about 100 kc. The

♦

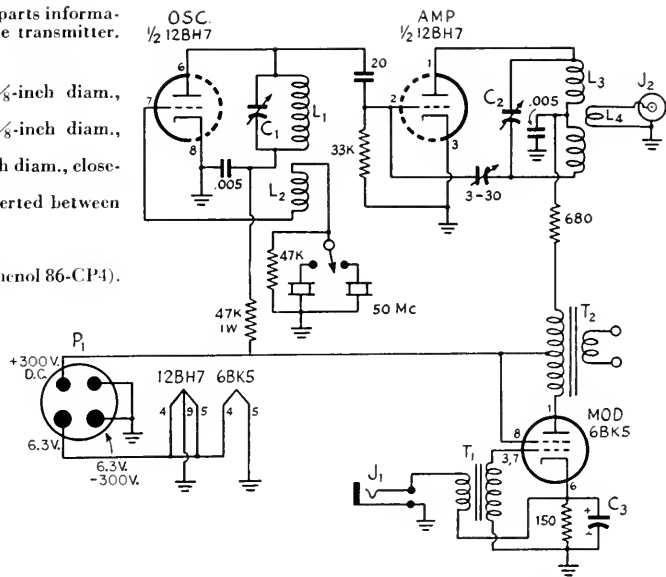
No, this isn't a converter—it's a complete 50-Mc. transmitter, audio and all. It runs 7 watts input, yet it is small enough for steering-post mounting.

♦





T<sub>2</sub>—Plate to voice coil transformer (Merit A2900).

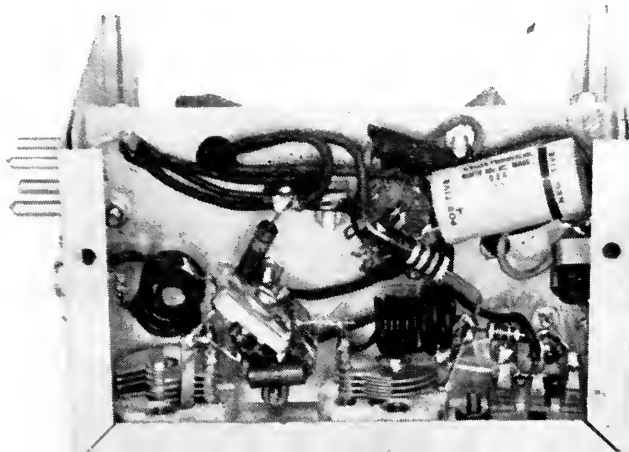


The author wishes to thank John J. Nagle, W3JES, and George R. Sugar, ex-W3KQS, for their work on the photographic portion of this article.

## Tune-up

With the final disabled by removing its plate voltage, the oscillator is checked for operation

Under the chassis of the 50-Mc. transmitter may be seen, right to left along the bottom of the picture, the crystal switch, the oscillator coils and tuning condenser, and the final tank circuit at the far left.



# A One-Element Rotary for 21 Mc.

*Utilizing Readily Available Materials in a Simple Antenna*

BY LEWIS G. McCOY, W1ICP

LATELY, more and more amateurs are "discovering" the 15-meter band. Here is a band where it is possible to make long-distance contacts with low-power transmitters. Another feature of 15 meters is that antennas can be much smaller than those necessary for the lower frequency bands. The smaller antenna can be rotated to take advantage of the directional characteristics of an ordinary half-wave dipole.

Before discussing the actual construction of such an antenna, let's first clear up an erroneous impression about antennas that many newcomers seem to have. For some reason, many amateurs starting in the hobby get the idea that a horizontal half-wave antenna has no directional properties. In other words, they believe that when power is fed into such an antenna, the power will be radiated equally well in all directions. This is a completely mistaken concept. A horizontal half-wave antenna produces maximum radiation broadside to the radiating element. The least amount of radiation is from the ends of the antenna. Hence, a horizontal half-wave antenna is "bidirectional." If the ends of the antenna point north and south, maximum radiation will be east and west. To obtain the benefits of the directional properties of the antenna, it is only necessary to rotate it 180 degrees. Here are the constructional details for such an antenna that can be built for less than \$15, complete with mast, wall mounting and 50 feet of feed line.

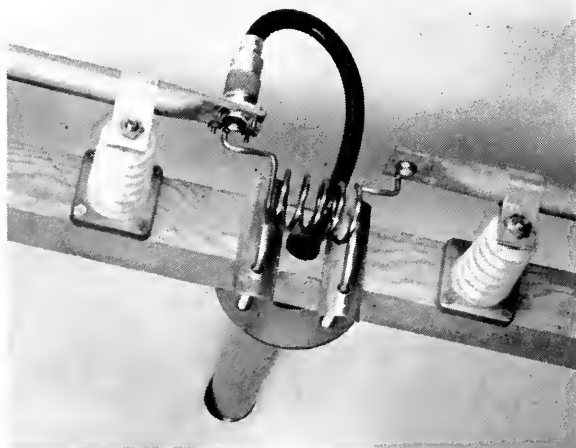
<sup>1</sup> A half-wavelength antenna would normally be fed with 72-ohm cable, since the antenna offers a good match for this impedance value. In this antenna system, the shorter elements, plus the small coil, offer a good match for 52-ohm cable.

• Here is an antenna that practically builds itself. Made from electrician's thin-wall tubing, a material sold in any electrical supply store, its main feature is that no cut-and-try methods are involved in its construction. Build it according to the directions in the article, and sit back and watch "solid" QSOs pile up.

## Construction

The antenna is made from two pieces of ½-inch diameter electrical thin-wall steel tubing or conduit. This tubing is readily available at any electric supply shop and sells for approximately seven cents a foot. It comes in 10-foot lengths and, while 20 feet is short for a half-wave antenna on 21 Mc., with loading the length is just about right for 52-ohm feed line.<sup>1</sup> If aluminum tubing is available, it can be used in place of the conduit, and the antenna will be lighter in weight. However, it is sometimes difficult to obtain aluminum, while steel thin-wall conduit is available in any electrical supply house.

As can be seen in Fig. 1 and the photographs, the two pieces of tubing are supported by four stand-off insulators on a four foot long 2 by 2. The coax fitting for the feed line was mounted on the end of one of the lengths of tubing. A mounting point was made by flattening the end of the tubing for a length of about 1½ inches. The tubing can be flattened by squeezing it in a vise or

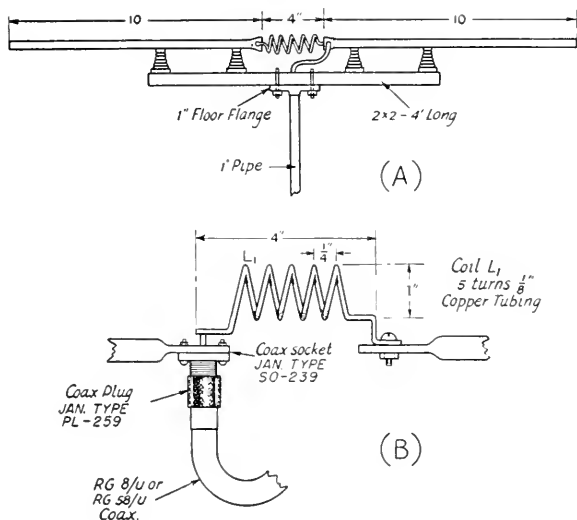


◆

This view shows a close-up of the coil and coax fitting mountings. Be sure that the coil doesn't short out to the outer conductor when soldering the coil end to the inner conductor pin on the coax fitting.

◆

Fig. 1 — (A) Diagram of the antenna and mounting. The U bolts that hold the 2 by 2 to the floor flange are standard 2-inch TV mast type bolts. (B) A more detailed drawing of the coil and coax-fitting mountings. The  $\frac{1}{4}$ -inch spacing between turns is not critical, and they can vary as much as  $\frac{1}{16}$  inch without any apparent harm to the match.



by laying the end of the tubing on a hard surface and then hammering it flat. This will provide enough space to accommodate the coax fitting (Amphenol type 83-1R). A  $\frac{5}{8}$ -inch hole will be needed in the flat section to clear the shell of the coax fitting.

The coil,  $L_1$ , is made from  $\frac{1}{8}$ -inch diameter copper tubing. It consists of 5 turns spaced  $\frac{1}{4}$  inch apart and is 1 inch inside diameter. The coil is connected in series with the inner conductor pin on the coax fitting and the other half of the antenna. In order to secure a good connection at the coax fitting, the coil lead should be wound around the inner-conductor pin and soldered. The other end of the coil can be connected with a screw and nut.

### Mounting

The antenna was mounted on a 1-inch floor flange and held in place by two 2-inch bolts, as shown in the photograph. The floor flange was connected to a 12-foot length of 1-inch pipe which served as a mast. Television antenna wall mounts were used to support the mast. In the installation shown, 19-inch wall mounts were used in order to clear the eaves of the house. A 2-inch long piece of  $1\frac{1}{4}$ -inch pipe was used as a sleeve, and it was clamped in the U bolt on the bottom wall mount. A  $\frac{1}{4}$ -inch hole was drilled through the mast pipe approximately 6 inches from the bottom. Then a  $1\frac{1}{2}$ -inch bolt was slipped through the hole and the mast was then mounted in the sleeve on the bottom wall mount. The bolt acted as a bearing point against the top of the sleeve.

Another  $\frac{1}{4}$ -inch hole was drilled through the mast about three feet above the bottom wall mount. A piece of  $\frac{1}{4}$ -inch metal rod, six inches long, was forced through the hole so that the rod projected on each side of the mast. To turn the mast, a piece of rope was attached to each end of the rod and the rope was brought into the shack, so that the antenna could be rotated by the

"arm-strong" method. Obviously, one could spend more money for a "de luxe" version and use a TV antenna rotator and mast.

RG-8/U 52-ohm coax cable was used to feed the antenna shown. For power inputs up to 100 watts, the smaller and less expensive RG-58/U can be used. However, when you buy RG-58/U, be sure that the line is made by a reputable manufacturer (such as Amphenol or Belden).



The antenna mounted against the side of the house, using TV wall mounts for holding the mast. The feed line comes out of the bottom of the mast and through the wall into the shack.

Some of the line made for TV installations is of inferior quality and is likely to have higher losses. The feed line was fed up through the mast pipe and through a  $\frac{3}{4}$ -inch hole in the 2 by 2. An Amphenol 83-1SP fitting on the end of the coax line connects to the female fitting on the antenna.

### Coupling to the Transmitter

It may be found that, when the feed line is coupled to the transmitter, the antenna won't take power. Since the line is terminated at the antenna in its characteristic impedance of 52 ohms, the output of the final r.f. amplifier must be adjusted to couple into a 52-ohm load. Where the output coupling device is a variable link, all that may be needed is the correct setting of the link. If the link is fixed, one end of the link can be grounded to the transmitter chassis and the other end of the link connected in series with a small variable capacitor to the inner conductor of the feed line. The outer conductor of the coax is grounded to the transmitter chassis. The condenser is tuned to the point where the final amplifier is properly loaded. Such a system is shown in Fig. 2. Incidentally, this is the type of system that could be used with the Heathkit transmitter.

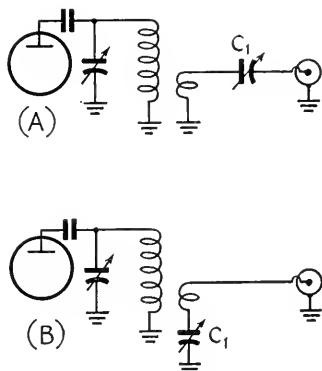


Fig. 2—The variable coupling condenser,  $C_1$ , described in the text, can be connected as at (A) or (B), depending on which is more convenient for a particular transmitter. The condenser can be a receiving type of 50 to 100  $\mu\text{f.}$  capacity.

For transmitters having a pi-network output circuit, it is merely a matter of adjusting the network to the point where the amplifier is properly loaded.

In the event operation on 15 meters is in an area where one may have to contend with TVI, it may be necessary to use a low-pass filter to attenuate any harmonics likely to cause trouble. A simple filter was described in a recent issue of *QST*.<sup>2</sup> The filter is merely inserted in series with the coax feedline. This should take care of harmonic TVI problems.

### Performance

Several different tests were made with the antenna including on-the-air checks with U. S. and

<sup>2</sup> McCoy, "The Tin Can Low-Pass," *QST*, Sept., 1954.



Over-all view of the antenna and mounting.

foreign stations. The standing-wave ratio was carefully checked and at no point in the entire 21-Mc. band did the ratio exceed 1.3 to 1.

On the first CQ using the antenna, KP4WI answered and kindly consented to check the signal while the dipole was rotated. With the antenna broadside to him, his S-meter reading was 10 db. over S9. When the end of the antenna was pointed in his direction, the reading dropped to S1 to S3. Practically identical performance reports were received from W7SFK in Montana, from W5KC in Louisiana, and from DL2WW in Germany.

On reception, the variation from broadside to end was not as great as with transmitting reports. However, in many cases it was enough to make the difference between hearing a signal and not hearing one.

The simplicity of the antenna and the low cost, together with the improved performance over a fixed antenna, make it a worth-while project for an amateur interested in 15-meter operation. At the time of this writing, an OQ5 station in the Belgian Congo was heard on 15 meters working Novice stations. Who will be the first Novice DXCC?

### MEMBERSHIP CHANGES OF ADDRESS

Four weeks' notice is required to effect change of address. When notifying, please give old as well as new address. Advise promptly so that you will receive every issue of *QST* without interruption.

Using a 304-TH as a grounded-grid amplifier, this unit can utilize to good advantage the full output of any of a number of popular commercially-built transmitters for driving power. The push-rod operated band-changing switch can be seen projecting through the panel at the left-hand end.



## Grounded-Grid and the 304-TH

*Utilizing "100-Watt" Rigs for Driving*

BY THOMAS P. LEARY,\* WØVTP

ONE thing that bothers most of us about designing and building a final amplifier is neutralization. This old dragon is with us in all conventional triode circuits, and a great many tetrodes also require it. But, with the right tube, the grounded-grid circuit will put the neutralizing condenser and split-stator tank back in the junk box.

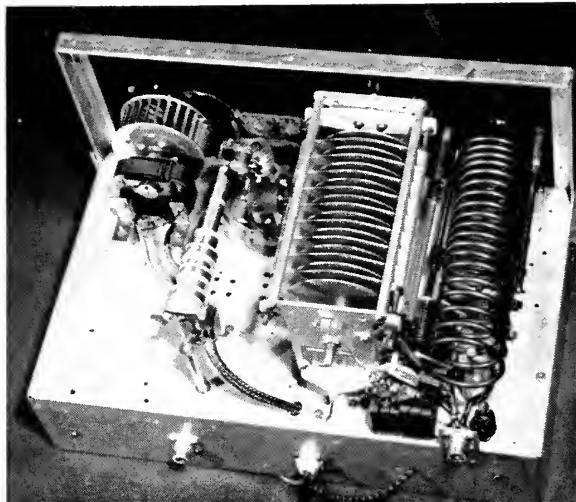
Still, we can't get something for nothing and grounded-grid operation requires four to six times the driving power. If we haven't already lost you, let's see what can be done with this arrangement.

Only the normal drive requirement of the tube is dissipated in the grid circuit; the remaining power passes through it and is added to the total power output. The filament, or input, circuit has a very low impedance, permitting the amplifier to operate as a Class B linear without swamping resistors.

Many amateurs own a Collins 32-V, a Johnson Viking or a homebrew rig with an output in the vicinity of 135 watts or more. When switching to higher power it seems a shame to dispose of this equipment, and somewhat ridiculous to use it to drive a final requiring only a few watts for the purpose. But such an exciter can be used without modification to drive a tube like the 304-TH to a kilowatt on c.w. or 750 watts on 'phone. With the same plate efficiency, the grounded-grid stage

can put out more power than a conventional amplifier since additional r.f. is obtained from the driver. And, because we have no need for neutralizing, a pi-section output is a simple addition to the circuit. In Class B linear service only about 25 watts of drive is required which results in 200 watts of a.m. carrier. With high level, 100 per cent plate modulation cannot be obtained by modulating the final alone, since a fraction of the output originates in the driver, but the extra carrier is useful in getting through the QRM.

The main requirement for a tube to be operated in this manner is a low plate-to-filament capacity. The 304-TH has a capacity of about  $0.7 \mu\text{f}$ , plus the added advantage of an internal shield connected to the grid. The grid, which is grounded for r.f. through a by-pass condenser, shields the input and output circuits from each other in much the same manner as the screen grid in a tetrode. The driving power required depends to a great extent on bias and increases as the bias goes up. At cut-off ( $-135$  volts with 2500 volts on the plate) the 304-TH can be loaded to draw 400 plate milliamperes with 135 watts of drive and 40 ma. of grid current. Under these



The top-of-chassis layout, showing the blower (left) and copper-tubing tank coil (right). The fixed output condensers of the pi network are at the edge of the chassis in the right foreground.

\*8506 Broadmoor Dr., Omaha, Nebr.

conditions, using a bank of light bulbs and a light meter, 800 watts output was measured. Since at least twice cut-off bias is desirable for good linearity with plate modulation, about -250 volts should be used for 'phone operation. One hundred watts will then drive the tube to 750 watts input, still with 40 ma. of grid current. However, it was found possible with this circuit to modulate the final at a kilowatt input with cut-off bias without any splatter or serious deterioration of quality.

A 304-TL may also be used but drive requirements will be increased about 30 per cent. As an example, if a 200-watt exciter is available, the 304-TL, with -380 volts bias and 3000 volts on the plate, can produce more than a kilowatt output with input at the legal limit.<sup>1</sup> Both types can still be found in surplus stocks for less than \$10.00.

<sup>1</sup> The power rating of a grounded-grid amplifier is not covered explicitly in the current amateur regulations, but FCC's interpretation is that the plate input to the "final stage" shall be considered to be the sum of the plate inputs to all stages contributing output power to the antenna. — Ed.

## Circuit

As can be seen from Fig. 1, drive is injected into the filament-grid circuit and the power output is taken between grid and plate. Power sensitivity is very low and if plate-filament feedback can be kept to a minimum no neutralization is required. This means that the input circuit must carry the regular filament current in addition to r.f., and ordinary bandswitching of the input is not desirable. To conserve space, the amplifier to be described was designed for 40, 20, 15 and 10 meters only. The main filament coil (a dual winding) is used alone for 40 meters and the other coils are switched in parallel to cover the higher frequencies. The 52-ohm input link is coupled to the filament coil only, and need not be varied over the different bands; however, some system of changing the coupling between the driver tank and coax line should be provided. The internal antenna coupler in transmitters like the Collins, or a pi-section in the driver output, is entirely satisfactory.

The amplifier output circuit will match a 52-ohm line. A 9000-volt tank condenser was found

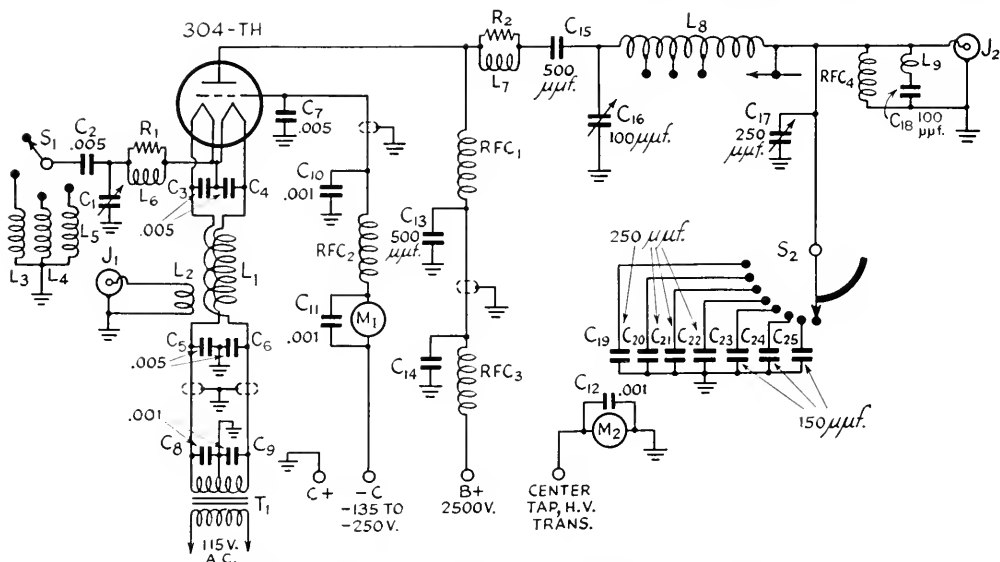


Fig. 1 — Circuit of the 304-TH grounded-grid amplifier. Capacitances are in  $\mu\text{f}$ . except where specified otherwise.

C<sub>1</sub> — 150- $\mu\text{f}$ . variable condenser (Johnson 150F20).

C<sub>2</sub> to C<sub>7</sub> — 0.005- $\mu\text{f}$ . mica, 1000 v.

C<sub>8</sub> to C<sub>12</sub> — 0.001 disk ceramic, 600 v.

C<sub>13</sub> to C<sub>15</sub> — 500- $\mu\text{f}$ . ceramic, 20 kv. (Sprague 20DK-15).

C<sub>16</sub> — 100- $\mu\text{f}$ . variable, 9000 v. (Johnson 100D90).

C<sub>17</sub> — 250 $\mu\text{f}$ . variable, 0.026-inch spacing.

C<sub>18</sub> to C<sub>25</sub> — 2500-volt mica.

L<sub>1</sub> — Two parallel windings No. 12 enam. on National XR-10A form, 10 turns of the two wires in parallel. Advance winding a notch with each turn.

L<sub>2</sub> —  $4\frac{1}{2}$  turns No. 18 stranded, polyethylene insul., wound directly on cold end of L<sub>1</sub> (TV "anode lead").

L<sub>3</sub> — 13 turns No. 12 enam.,  $1\frac{1}{4}$ -inch diam., 3 inches long, air-wound.

L<sub>4</sub> — 6 turns 3/16-inch copper tubing,  $1\frac{1}{4}$ -inch diam.,  $2\frac{1}{2}$  inches long, air-wound.

L<sub>5</sub> — 1 turns 3/16-inch copper tubing,  $1\frac{1}{4}$ -inch diam.,  $2\frac{1}{4}$  inches long, air-wound.

L<sub>6</sub>, R<sub>1</sub> — Filament parasitic choke and resistor; see text.

L<sub>7</sub>, R<sub>2</sub> — Plate parasitic choke and resistor; see text.

L<sub>8</sub> — See text.

L<sub>9</sub> — Resonate to desired TV channel with C<sub>18</sub>.

J<sub>1</sub>, J<sub>2</sub> — Coax connectors, chassis-mounting type.

M<sub>1</sub> — 0-500 d.c. milliammeter.

M<sub>2</sub> — 0-150 d.c. milliammeter.

RFC<sub>1</sub> — National R-175A r.f. choke.

RFC<sub>2</sub>, RFC<sub>3</sub> — 2- $\mu\text{h}$ . r.f. choke, 500 ma. (National R-60).

RFC<sub>4</sub> — 2.5-mh. r.f. choke.

S<sub>1</sub> — Single-pole 4-pos. steatite rotary (Centralab 2542).

S<sub>2</sub> — Single-pole 9-pos. progressive shorting steatite rotary (Centralab PA 2012). Two in parallel will be more satisfactory.

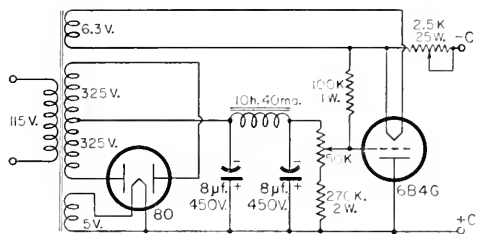
T<sub>1</sub> — 10-11-volt 12-amp. filament transformer (Thordarson 21F19).

An electronically-regulated bias supply was found to be desirable for c.w. operation when keying an earlier stage. If the amplifier grid leak is used as the bleeder on a bias supply delivering cut-off voltage, as is common practice, the bias supply must be unusually husky because of the low value of grid-leak resistance required. The bias supply circuit used is shown in Fig. 2. The control provides a means for varying the key-up bias between about 90 and 250 volts. Additional

the chassis. The tank condenser is placed just to the left of the tube and mounted upside down to obtain a short lead from the plate cap to the center of the stator. The R175A choke is placed horizontally with its top near the tube cap. The tank coil is mounted to the left of the condenser with the "cold" end toward the front. The coax socket, loading condensers and switch are located to the rear between the coil and condenser.

A small shield was found necessary above chassis between the 304-TH and the tank condenser, to eliminate capacitive coupling with the filament.

The main filament coil is mounted horizontally, lengthwise with the chassis, with the "hot" end just behind the base of the tube. To the right of the tube, under chassis, is the filament variable condenser. The 20-, 15-, and 10-meter coils are grouped compactly around the coil switch and

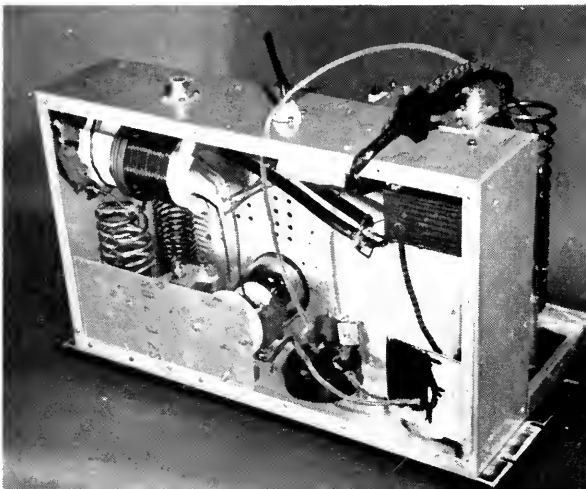


operating bias is obtained from the voltage drop in the 2500-ohm adjustable resistor when grid current flows.

This amplifier is the result of considerable sweat and experimentation and the builder may depart from the illustrated component layout at his own risk. Contrary to some published information, grounded-grid does not eliminate parasitics with these tubes and great care must be taken to keep plate-to-tank-condenser and filament-to-input-condenser leads short. The parasitic chokes and resistors should make up most of these leads. Complete shielding, without any inductive coupling, must be maintained between input and output circuits to prevent oscillation on the operating frequency.

The amplifier is mounted on a  $10 \times 17 \times 4$ -inch aluminum chassis. The filament components are located on the under side at the right. A dividing shield and ventilated bottom cover are placed over this half, while the left under side is used to mount the filament transformer and meters. A  $2\frac{1}{2}$ -inch hole is cut near the front of the chassis, with its center 7 inches from the right-hand edge, and the 304-TII is submounted so that the internal shield is level with the top of

The cathode tuned circuit occupies the left-hand end of the chassis in this view. The bifilar coil at the top is used on all bands, additional inductances being connected in parallel to shift the tuning to the band in use.



the ends soldered directly to the tabs on the switch. The opposite ends of all three are soldered together and connected by a short lead to ground.

The filament by-pass condensers are connected directly across the socket terminals. The parasitic choke and resistor are fastened between the right-hand forward socket terminal and the front stator connection of the filament variable condenser.

The filament transformer is located under the chassis in the left rear corner. The transformer specified is somewhat overloaded for this use and runs hot but it will deliver the voltage if the 11-volt primary tap is used.

We have the old-fashioned notion that nothing can beat air-wound copper tubing for a low-loss coil. There was no room in this set-up for a conventional high-power switch, so we hit on the idea of using fuse clips fastened directly to the tank coil. The coil itself is  $19\frac{1}{2}$  turns of  $\frac{3}{16}$ -inch copper tubing, 2 inches in diameter and  $7\frac{1}{2}$  inches long. First, close-wind the coil and spread it to 6 inches. Then spread the rear  $5\frac{1}{2}$  turns until the whole thing is  $7\frac{1}{2}$  inches long. The coil is supported on  $\frac{3}{4}$  by  $2\frac{1}{2}$ -inch stand-offs and soldered to screws in the tops of the three insulators at the 3rd, 8th and 18th turns (approximately) counting from the rear of the chassis. The fuse clips are soldered or fastened to holes in the tubing with small screws, in line at  $3\frac{1}{2}$ ,  $5\frac{1}{2}$  and  $8\frac{1}{2}$  turns, also counting from the rear. A piece of  $\frac{1}{4}$ -inch brass rod, with the point rounded, acts as a shorting bar between the clips and is connected to a piece of  $\frac{1}{4}$ -inch fiber rod with a shaft coupling so that it can be slid in and out from the front panel. A  $\frac{3}{16}$ -inch copper tubing lead runs from the front of the coil to the rear coax connector, and another fuse clip is fastened to this lead with a short piece of tubing so that it always grips the shorting bar to complete the connection. The whole assembly can be made quite rigid and the fuse clips make a positive, self-cleaning connection. Different points can be scribed on the fiber rod to indicate the correct setting for each band.

Heat-radiating connectors should be used on the grid and plate leads of the 304-TH. The grid by-pass condenser to ground should have practically no leads.

The parasitic resistors are of the Global type, available from General Electric TV parts dealers. They are about  $1\frac{1}{16}$  inch long,  $\frac{9}{16}$  inch in dia-

meter and come two to a package. The plate circuit parasitic choke is  $2\frac{1}{2}$  turns,  $\frac{1}{2}$ -inch diameter with the resistor paralleled across it with very short leads. The filament circuit parasitic choke consists of two turns wound directly on the resistor. Both are wound with No. 12 wire.

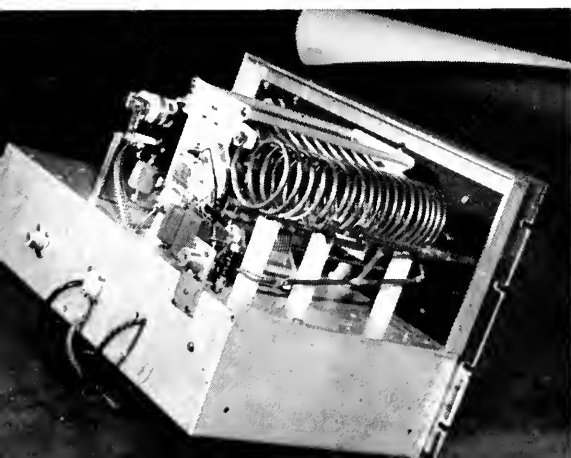
### Tuning and Operation

Since the filament and plate circuits are essentially in series, some differences may be expected in tuning as compared with an ordinary amplifier. Full excitation should not be applied without plate voltage on, since the rated grid dissipation will be exceeded and tube damage can result. Some way of reducing driving power, such as switching resistance in series with the plate supply primary of the exciter, should be provided.

First apply *reduced* excitation with plate voltage off. Do not exceed about 60 ma. of grid current; it will peak at the resonance point of the input condenser. Then resonate the plate condenser, which will be indicated by an increase in grid current. It will be noticed that some plate current will flow even without plate voltage, and a dip will be found at resonance. Now apply reduced plate voltage through a series resistance, like a 500-watt photo-flood bulb, in the primary of the plate transformer. With bias reduced below cut-off, make the usual checks for parasitics with different settings of the tuning condensers. Then apply full voltage. Grid current will probably disappear, so increase excitation and make additional adjustments for maximum grid and minimum plate current. Loading can be controlled with the variable loading condensers. Keep an eye on the plate current drawn by the driver stage while making adjustments in the final, as coupling may have to be reduced to keep the driver tube from exceeding its ratings. Bias may be reduced to near cut-off for c.w. in order to obtain at least 40 grid milliamperes at a kilowatt input; however, the more bias the better the plate efficiency. With practice, the stage may be moved around the band very quickly; the filament circuit tuning is fairly broad and requires only occasional adjustment.

For Class B linear amplification of an a.m. signal, maximum input is 500 watts. Reduce the drive to about 25 watts or until no grid current flows without modulation. With modulation it should rise to about 20 ma. in peaks with bias

*(Continued on page 126)*



The shorting rod for band changing runs along the side of the tank coil, making contact with fuse clips fastened to the proper turns on the coil.



# General Techniques of 10-Meter Mobile Noise Reduction

## Wavetraps as Ignition Suppressors

BY TALMADGE R. ENGLAND,\* W4MJJ

• In this article, W4MJJ discusses the use of tuned wavetraps in suppressing electrical noise in 10-meter mobile installations.

**M**OBILE OPERATION of amateur stations is ever becoming more popular, and especially will this be true if ten meters finally does open wide next year (it's always next year!). What follows is intended to give the would-be mobileer a fundamental insight into the cause of the biggest headache of mobile operation — noise. Compared to the elimination of noise, especially in the ten-meter band, the actual installation of the equipment is comparatively easy.

Now every ham knows that whenever a spark occurs some r.f. noise is generated. In fact, it is not at all necessary that there be a spark — merely a surge of current. The current surge induces transients in the associated wiring or, what amounts to the same thing, it “shock”-excites the inductance and capacitance of the wiring into a damped oscillation. Due to the random distribution of these two parameters, the oscillations occur at many frequencies. It is probably unnecessary to point out that the car's ignition system is the biggest noise producer, with the generator and regulator trailing. Indeed, if ten-meter operation is contemplated, you had best decide that complete elimination is impossible, and purchase or build a good noise limiter at the outset. However, the limiter, used in conjunction with standard methods of suppressing noise in its various and sundry spots, and traps in the ignition system (to be described), will reduce the interference to a most tolerable level.

While standard methods of noise suppression are aptly detailed in late editions of *The Radio Amateur's Handbook* and will not be repeated here, it will be interesting to enumerate the basic methods in a general manner. By keeping in mind the simple idea of what transients are and how they arise, the following seven methods of reducing or eliminating them are evidently fundamental: (1) elimination of  $L$  and/or  $C$ ; evidently, no oscillatory transients would then be possible — but neither is the method. (2) Elimination of the spark. This is not so impossible as it sounds, for that is precisely what we do when graphite grease is used in the wheel

bearings to eliminate wheel static. (3) Damping the oscillation. This is the usual method of reducing ignition interference; i.e., by installing resistors in the wiring. Unfortunately, this method is not applicable to other parts of the electrical system. (It is interesting that from a theoretical viewpoint there is a critical value of damping resistance beyond which no oscillatory transients are produced, but the value is too large to be of practical use.) (4) Shielding of wiring. (5) Grounding of such possible radiating elements as the tail pipe. (6) By-passing of the various electrical



A trap installed at a spark plug in W4MJJ's car.

components of the car, such as dome light, gas gauge, etc. It should be kept in mind that a car's electrical system, being of low voltage, is a low-impedance system. By-passing is, therefore, not so effective as might be expected. (7) Rejection by the use of tuned traps or chokes.

The last method has been too much neglected. Although some amateurs do use tuned traps in the generator lead, no one seems to have tried them in the ignition wiring. The author installed traps on each plug, and inserted similar traps in the main tower of the distributor, and at the generator and the regulator. The generator and regulator traps practically eliminate noise from these two sources, whereas by-passing will not. Noise rejection in the ignition system is at least as good as that obtained with resistor suppressors. But where ignition interference is concerned, the

(Continued on page 128)

\*% WMIK, P. O. Box 698, Middlesboro, Ky.

# Using the 6524 Dual Tetrode on 432 Mc.

## *A Tripler-Amplifier To Follow Your Present 2-Meter Rig*

BY EDWARD P. TILTON, W1HDQ

THE fellow who wanted to put more than a couple of watts on 420 Mc. had little in the way of tube choice until recently. There were only a few transmitting tubes on the market that would do the job, and prices for these began at around \$25.00 each. Introduction of the Type 6524 dual tetrode recently<sup>1</sup> by RCA should help to promote more use of the 420-Mc. band, as this new tube can be bought for considerably less than anything we've had available previously.

Designed especially for u.h.f. mobile service, the 6524 is a natural for use in 420-Mc. amateur work. Operating from a plate supply of 300

power into the transmission line, and of course the shielding is an aid to TVI prevention.

The main chassis is fitted with a bottom cover. Air from the fan mounted on the rear wall is circulated up around the tripler tube, at the left, and through  $\frac{1}{4}$ -inch holes below the amplifier tube. Holes in the top cover are the only means for this air to escape, and thus the cooling flow is concentrated where it will do the most good. The number of holes in the top cover, and in the chassis under the amplifier tube, can be varied until an equal flow of air appears to be coming through the two top sets of holes. This can be checked readily by noting how

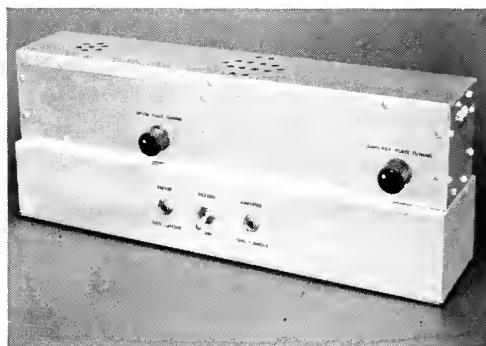
◆  
Tripler-amplifier for 432 Mc. Note that complete shielding and forced-air cooling are employed.

to 375 volts, one 6524 as a tripler will drive another as a straight-through amplifier. Output from the tripler stage can be as much as 8.5 watts, and the amplifier will deliver up to 20 watts. These ratings are for 470 Mc., so some leeway is left for the amateur in getting efficient operation at the third multiple of his 2-meter frequency.

The transmitter shown here is a modernized version of the dual tetrode rig that has appeared in the *Handbook* for some years. It can be driven with a 2E26 amplifier on 144 Mc. readily, as the driver power output need be no more than 4 to 6 watts at 144 Mc. Output on 432 Mc., under plate-modulation conditions, is a good 12 watts; enough to make quite a respectable signal. On f.m. or c.w., it can be boosted to the 20-watt ICAS operating conditions.

### Construction

It will be noted that provision is made for enclosing the tubes and tank circuits completely. The enclosure serves two purposes: it provides a path for circulation of cooling air, and holds down radiation from the tank circuits. The latter consideration is important in getting



briskly a sheet of paper rises from either set of holes when the fan is started. This check should, of course, be made with the bottom plate in place.

The fan shown provides a flow of 17 cubic feet per minute, more than adequate for the job, so no great care was taken to stop small air leaks. Where a smaller fan is used, all air holes should be plugged. Small holes and cracks can be sealed with household cement, and the meter jacks should be plugged in this case.

The tripler tube is mounted vertically, at the left, with its socket  $1\frac{1}{2}$  inches below the chassis. There is just room under the socket for the self-resonant input circuit,  $L_2$ . The amplifier tube is horizontal, with its socket mounted in back of a plate that is 8 inches from the left edge of the  $3 \times 4 \times 17$ -inch aluminum chassis. The shielding enclosure is  $3\frac{1}{4}$  inches wide by  $3\frac{1}{2}$  inches high.

Half-wave lines are used in all 432-Mc. circuits. The grid circuit of the amplifier is capacitively coupled to the tripler plate line, the two overlapping about  $1\frac{1}{4}$  inches. The spacing between them must be adjusted carefully for maximum grid drive. Plate voltage is fed to the lines through small resistors. These should

<sup>1</sup>"World Above 50 Mc.," *QST*, October, 1951, p. 136.

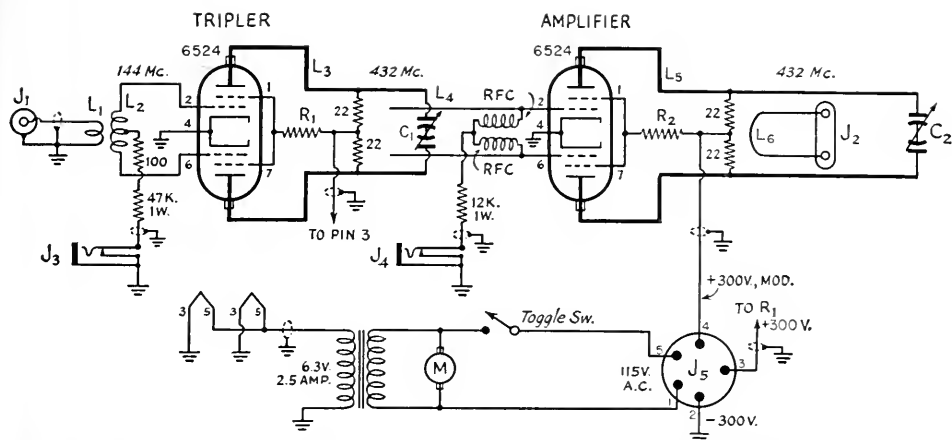


Fig. 1—Schematic diagram and parts information for the 432-Mc. tripler-amplifier.

C<sub>1</sub>, C<sub>2</sub> — 10- $\mu$ mf.-per-section split stator, double spaced (Bud LC-1664). Do not use metal end-plate or grounded-rotor types.

R<sub>1</sub>, R<sub>2</sub>—23,500 ohms, 2 watts (two 47,000-ohm 1-watt resistors in parallel).

$L_1$ —2 turns No. 20 enam.,  $\frac{1}{2}$ -inch diam. Insert between turns of  $L_2$ .

L<sub>2</sub>—4 turns No. 16 enam., 1/2-inch diam., 1/2 inch long, center-tapped,

L3 — Copper strap on heat-dissipating connectors, 3½ inches long. Twist 90 degrees ½ inch from plate end. Space ¾ inch.

L<sub>4</sub> — Copper strap  $2\frac{7}{8}$  inches long, soldered to grid terminals. Space about  $1\frac{1}{2}$  inch.

L<sub>5</sub> — Copper strap  $3\frac{7}{8}$  inches long, fastened to heat-dissipating connectors. Space  $\frac{3}{4}$  inch. All tank circuits of flashing copper  $\frac{1}{2}$  inch wide.

L<sub>6</sub> — Coupling loop, No. 20 enam., U-shaped portion is 1 inch long and  $\frac{5}{8}$  inch wide. Mount on 3-inch ceramic stand-offs.

J<sub>1</sub> — Coaxial input fitting (Amphenol 83-1R).

J<sub>2</sub> — Crystal socket used for antenna terminal.

J<sub>3</sub>, J<sub>4</sub> — Closed-circuit jack.

J<sub>5</sub> — 5-pin male chassis connector (Amphenol 86-RCP5).

M — Motor-blower assembly, 17 c.f.m. (Ripley Inc., Middletown, Conn., Type 8433),

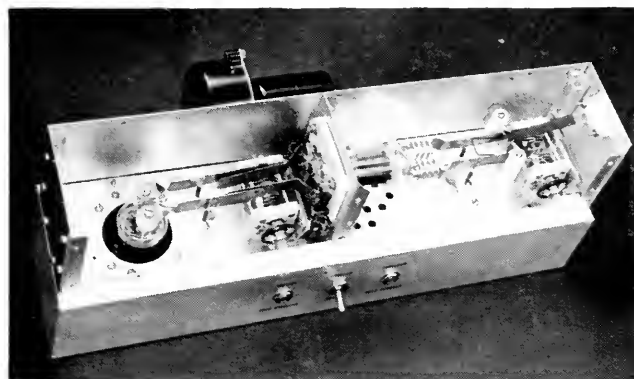
be connected at the point of lowest r.f. voltage on the lines. The amplifier grid r.f. chokes are connected at the tube socket.

Some interesting "bugs" were encountered in the development of this layout. A haywire test set-up was made to check the operation of the new tubes. They worked fine, so a "final" form was evolved as shown, except for the variable capacitors used for tuning the plate lines. At first we used a split-stator unit equipped with metal end-plates that grounded the rotors. With these the tripler gave more output on the second harmonic than on the third. When the rotor was ungrounded there was a considerable improvement. As this particular capacitor could not be mounted conveniently without grounding the rotor, we next tried the capacitors

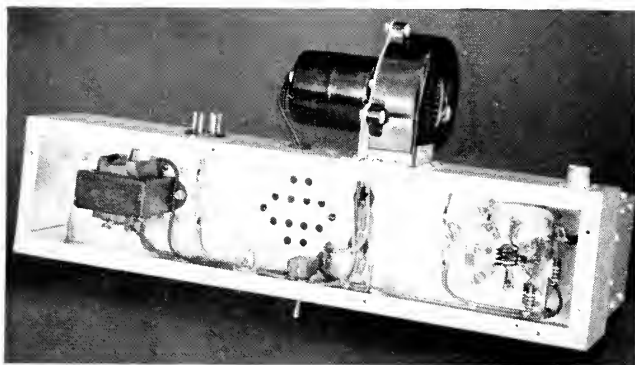
specified. These have metal mounting brackets, but they are not connected electrically to the rotor shaft. Even with these units, using the metal brackets grounded to the chassis threw the tank circuits out of balance, so it was necessary to mount the capacitors up on edge, on polystyrene plates. With this arrangement there was practically no second harmonic in evidence in the tripler tank circuit, and both it and the amplifier circuit tuned normally and showed good efficiency.

## Testing

The tripler-amplifier is designed to operate in conjunction with a 144-Mc. transmitter such as the 2E26 rig shown in October *QST*.<sup>2</sup> A plate supply of 300 volts at 200 ma. is needed. Apply power to the 144-Mc. driver stage and adjust the spacing of the turns in  $L_2$  and the degree of



<sup>2</sup> Tilton and Southworth, "A Step-by-Step Station for the V.H.F. Man," *QST*, October, 1954, p. 16.



Bottom view of the tripler-amplifier, with plate removed. The tripler tube socket is at the right.

coupling between  $L_1$  and  $L_2$  for maximum tripler grid current. This should be about 3 ma.

Next apply plate and screen voltage to the tripler and tune  $C_1$  for maximum grid current in the amplifier, with no plate or screen voltage to the latter. Adjust the position of the grid lines with respect to the plate circuit, readjusting  $C_1$  whenever a change is made, until at least 4 ma. grid current is obtained.

Now connect a lamp load across the output terminal,  $J_2$ . Ordinary house lamps are not suitable. A fair load can be made by connecting 6 or more blue-bead pilot lamps in parallel. This can be done by wrapping a  $\frac{1}{4}$ -inch copper strap around the brass bases and soldering them all together. Then another strap should be soldered to the lead terminals. Apply plate and screen voltage and tune  $C_2$  for maximum lamp brilliance. It should be possible to develop a very bright glow in the 6-lamp load with a plate current of about 100 ma. at 300 volts.

Cut drive very briefly to check for oscillation in the final stage. Grid current should drop to zero. The rig is then ready for use. The screen and grid resistors shown are for operation with plate modulation. Somewhat more output and input can be run if the screen or grid resistance is decreased slightly, but this should be done only when the rig is to be used for f.m. or c.w. service.

Operating conditions are about as follows: tripler grid current—2 to 3 ma.; amplifier grid current—3 to 4 ma.; tripler plate and screen current—90 ma.; amplifier plate and screen current—110 ma.; output—12 watts.

In choosing the operating frequency it is well to bear in mind that nearly all work being done in the 420-Mc. band involves tripling from commonly-used frequencies in the 2-meter band. By mutual agreement, to make it a relatively simple matter for stations using narrow-band techniques to find one another, stabilized transmitters are kept between 432 and 436 Mc.

This tripler-amplifier was built around the 6524 tetrodes, but the same general construction can be used with other dual tetrodes such as the 6252 and 5894A by Amperex and the 832A. With the 6252, operating conditions will be quite similar to those given above. With the 5894A (9903), up to 40 watts output can be

obtained on c.w. or f.m., and 25 to 30 watts with plate modulation. The 832A will deliver only about 5 watts. The pin connections given in the schematic diagram are for the 6524.

## WWV-WVVH SCHEDULES

For the benefit of amateurs and other interested groups, the National Bureau of Standards maintains a service of technical radio broadcasts over WWV, Beltsville, Md., and WVVH, Maui, Territory of Hawaii.

The services from WWV include (1) standard radio frequencies of 2.5, 5, 10, 15, 20 and 25 Mc., (2) time announcements at 5-minute intervals by voice and International Morse code, (3) standard time intervals of 1 second, and 1, 4 and 5 minutes, (4) standard audio frequencies of 440 cycles (the standard musical pitch A above middle C) and 600 cycles, (5) radio propagation disturbance warnings by International Morse code consisting of the letters W, U or N, together with digits from 1 through 9, indicating present North Atlantic path conditions and conditions to be anticipated. (See Measurements chapter of recent *Handbooks* for details on forecast symbols.)

The audio frequencies are interrupted at precisely one minute before the hour and are resumed precisely on the hour and each five minutes thereafter. Code announcements are in GMT using the 24-hour system beginning with 0000 at midnight; voice announcements are in EST. The audio frequencies are transmitted alternately: The 600-cycle tone starts precisely on the hour and every 10 minutes thereafter, continuing for 4 minutes; the 440-cycle tone starts precisely five minutes after the hour and every 10 minutes thereafter, continuing for 4 minutes. Each carrier is modulated by a seconds pulse, heard as a faint clock-like tick; the pulse at the beginning of the last second of each minute is omitted.

## Strays

VE2QQ should be ready for the Commandos after his recent experience in "hitting the beaches." Within an hour, he raised K2EP, Long Beach, N. Y., W4BTO, Palm Beach, Fla., and W6MPY, Long Beach, Cal., all on 40-meter c.w.

# Results - 1954 W/VE Contest

Gordy Webster, VE2BB, contest chairman of the Montreal Amateur Radio Club, sponsors of the W/VE Contest of last September 25th and 26th, announces final results of the activity. Leading Canadian score was that of Russ Wilson, VE6VK, who posted 37,725 points by working 252 stations in 50 sections. Across the border, W9PZT led all U.S.A. entrants with 17,853 points. In the tabulation below, the first-listed station in each ARRL section is a certificate winner. The figure following each call indicates the final score.

<i>N.Y.C.-L.I.</i>		<i>San Diego</i>	
W2BVN.....5375		W6WSS.....1067	
W2LGG.....4977			<i>N. Texas</i>
K2GHS.....448		W5BJA.....10,369	
K2CMV.....448		W5CAY.....1408	
<i>N. New Jersey</i>		W5VNW.....896	
W2EQS.....14,974		W5ZWR.....725	
W2LYO.....13,822			<i>Oklahoma</i>
W2AQT.....5802		W5CFC.....2560	
K2EUN.....3185			<i>New Mexico</i>
K2AFQ.....2304		W5VRP.....9471	
W2CVW.....2176		W5KF.....21	
K2EGZ.....1962			<i>Maritime</i>
K2GAS.....1706		VE1VB.....18,690	
W2MPP.....1493		VE1AE.....15,252	
W2BBK.....768		VO6N*.....14,766	
K2EPP.....320		VE1ZZ.....14,706	
<i>Iowa</i>		VE1EK.....11,672	
W0NPF.....8684		VO6U.....11,571	
W0VFM.....6314			<i>Quebec</i>
<i>Kansas</i>		W4KVM/VO6.....3770	
W0GAX.....3839		VE1CU.....3380	
<i>Missouri</i>		VE1OM.....2640	
W0GBJ.....7295		VE1WL.....2436	
W0FXN.....576			<i>Ontario</i>
<i>Connecticut</i>		W2SYF/VE2.....18,950	
W1ODW.....9726		VE2AT/D.....15,698	
W1JTD.....5460		VE2PZ.....4623	
W1NLM.....213		VE2BB.....2736	
<i>Matne</i>		VE2AM.....1140	
W1VEH.....1344		VE3DPG/3.....464	
<i>E. Massachusetts</i>		VE2RL.....315	
W1LQQ.....2730			<i>Alberta</i>
W5TPZ/1.....1194		VE3DRD.....26,492	
<i>W. Massachusetts</i>		VE3BBM.....23,868	
W1XXV.....3882		VE3ACB.....15,162	
W1ZUU.....3271		VE3DSQ.....14,550	
W1SYH.....2616		VE3AJR.....14,184	
<i>New Hampshire</i>		VE3BHS.....13,720	
W1ARR.....3982		VE3ATR.....12,768	
W1QGU.....2474		VE3BNF.....11,400	
<i>Idaho</i>		VE3ANL.....9272	
WN7VWS.....1024		VE3BY.....7581	
<i>Montana</i>		VE3DTN.....6028	
W7FUB.....768		VE3TM.....4004	
<i>Oregon</i>		VE3BHW.....4000	
W7UGQ.....2730		VE3DU.....3762	
<i>Washington</i>		VE3BNQ.....3462	
W7SRX.....299		VE3YV.....2000	
<i>Santa Clara Valley</i>		VE3AVS.....1900	
K6CLM.....1642			<i>Manitoba</i>
<i>San Francisco</i>		VE4HS.....966	
W6DWJ.....768		VE4MT.....693	
<i>San Joaquin Valley</i>			<i>Saskatchewan</i>
W6EUH.....21		VE5DA.....4356	
<i>North Carolina</i>		VE5DZ.....3472	
W4RXI.....22		VE5AJ.....1232	
<i>Virginia</i>		VE5RU.....1173	
W4BZE.....8447			<i>Alberta</i>
W4APM.....8361		VE6VK.....37,725	
W4IA.....6655		VE6ZR.....6783	
W4TFX.....5887		VE6OS.....2190	
W4JUF.....2986			<i>British Columbia</i>
<i>Utah</i>		VE7ALE.....21,836	
W7QDJ.....4095		VE7QQ.....5887	
W7SOJ.....554			<i>Yukon/N.W.T.</i>
<i>Wyoming</i>		VESYT.....9180	
W7UFB.....2688			<i>E. Pennsylvania</i>
<i>Alabama</i>		W3ADE.....1564	
W4WOG.....2816		W3EAN.....1024	
<i>E. Florida</i>			<i>Md.-Del.-D. C.</i>
W4VRS.....5972		W3AYS.....16,381	
<i>Georgia</i>		W3HTK.....8543	
W4BEY.....1546		W3HYM.....7212	
W4ZSC.....43		W3KLA.....5077	
<i>Los Angeles</i>		W3VD.....2389	
W6AM.....577		W3FV.....1216	
<i>Arizona</i>			<i>S. New Jersey</i>
W7RZQ.....1920		K2CPR.....9599	
		W2ILN.....6196	
		W2GND.....5631	

\* Labrador certificate winner.

<i>W. New York</i>		<i>Wisconsin</i>	
W2SCC.....12,478		W9GWK.....15,741	
W2RJJ.....2645		W9RKP.....12,542	
K2DXV.....1600		W9UDK.....10,174	
K2BRF.....1408		W9AEM.....8073	
W2QBB.....512		W9VZ.....4778	
<i>W. Pennsylvania</i>		W9DIK.....4255	
W3KQD.....3733		W9HDH.....1344	
W3VKD.....2304		W9YOS.....270	
<i>Illinois</i>		<i>Tennessee</i>	
W9PZT.....17,853		W4VNE.....8191	
W9WJV.....3285		<i>Kentucky</i>	
W9WIO.....2958		W4KVX.....12,115	
W9ASK.....2176		W4YOI.....1365	
W9UXN.....1742		<i>Michigan</i>	
W9CNF.....363		W8KPL.....6371	
		W8MSK.....2688	
<i>Indiana</i>		<i>Ohio</i>	
W9UWU.....8020		W8AJW.....16,509	
W9UKG.....7103		W8AQ.....7679	
W9SWR.....5119		W8CPQ.....6826	
W9FGX.....2816		W8MQQ.....5247	
W9POB.....2752		W8QHW.....4607	
W9FYM.....2503		W8RO.....4191	
W9UTL.....1877		W3PCS.....1194	
		W8OWZ.....1280	
		W8KMF.....398	

## NEW BOOKS

**Obtaining and Interpreting Test Scope Traces**, by John F. Rider. Published by John F. Rider Publisher, Inc., New York. 186 pages, 5½ by 8½, paper cover. Price, \$2.40.

Covers composition of waveforms of various types frequently encountered in practical work, how to adjust the oscilloscope for proper operation, and how to interpret what the scope shows. Particular attention is paid to pattern faults such as are caused by hum, distortion, and similar spurious effects. Chapters on Lissajous figures and various kinds of test set-ups are included.

**How To Use Test Probes**, by Alfred A. Ghirardi and Robert G. Middleton. Published by John F. Rider Publisher, Inc., New York. 172 pages, 5½ by 8½, paper cover. Price, \$2.90.

Operating characteristics, design considerations, and use of probes designed to work in conjunction with vacuum-tube voltmeters and oscilloscopes. The probes covered range from high-voltage d.c. and a.c. types through rectifying and demodulator types for low and high frequencies.

**How To Service Tape Recorders**, by C. A. Tuthill. Published by John F. Rider Publisher, Inc., 480 Canal St., New York 13, N. Y. Pub. No. 167. 154 pages, including index, 5½ by 8½, paper cover. Price, \$2.90.

Principles of recording on magnetic tape, with both general and specific operating and servicing data on current commercial equipment.

**Technician's Guide to TV Picture Tubes**, by Ira Remer. Published by John F. Rider Publisher, Inc., 480 Canal St., New York 13, N. Y. 160 pages, including index, 5½ by 8½ inches, paper cover. Price, \$2.40.

Describes the construction, operating principles and electrical characteristics of picture tubes, including projection and color. Accessories such as yokes, focus coils and ion traps are covered, with adjustment and repair data for the service technician.

# Three Stormy Sisters

## Part I—Carol and Edna

BY GEORGE HART, WINJM

• So many reports were received on amateur emergency activities during the three hurricanes that it became impossible to tell a complete story in allowable QST space for a single issue. We'll tell you about Hazel in a future QST.

TROPICAL HURRICANES are fickle and unpredictable things. Perhaps that's why they are given women's names. Not since 1944 has the Northeast received a visitation from a tropical storm, but this year, one decade later, as if to make up for past omissions, three screaming hurricanes, spawned in the Caribbean, made their destructive way up the Atlantic Coast. First Carol curved in out of the Atlantic, brushed Hatteras, howled up the Western Atlantic to hit the end of Long Island and deliver a smashing blow to Connecticut, Rhode Island and Eastern Massachusetts as she failed to curve out to sea as expected. Two weeks later Edna started north, maintaining a more easterly course and wreaking most of her havoc on Nantucket, Cape Cod, the Maine coast and the Canadian Maritime Provinces.

But Old Dame Nature was not yet through with her shenanigans. Early in October she whopped up a hurricane to end all hurricanes, and this one she named Hazel. Again coming up out of the Caribbean, Hazel struck inland as far south as Myrtle Beach, S.C. Through North Carolina, Virginia and Maryland she screamed in full fury. In the mountains of Central Pennsylvania she lost some of her force, only to gather herself for one last blow at the Toronto area before she dispersed.

Each of these stormy sisters wept millions of gallons of rain, tore down telephone and electric lines in witch-like fury, washed out roads, tore off roofs and smashed houses as though they were made of paper, and sent high tides with enormous waves smashing against beach resorts. In all areas, radio amateurs were called upon to provide emergency communication. Many of them have written Headquarters to tell us about it, and we intend to chronicle them here. Many more have never let us know what they did. This account is written on the basis of reports received.

### Carol

The Nassau County, L. I., AREC was alerted by the Red Cross at 1210 on August 31st, and W2KFV was put into operation on 10 and 2 meters. Mobiles were dispatched to East Rockaway, Long Beach, Atlantic Beach, Point Look-

out, Island Park, Oceanside, Freeport, Baldwin, Jones Beach, Gilgo Beach, Bellmore, Wantagh and Seaford on the south shore, and Manor Haven, Port Washington, Sea Cliff and Bayville on the north shore. A portable 2-meter station was set up at Red Cross headquarters in Mineola. The County c.d. station was activated on 10 and 2 meters with a link to Red Cross headquarters, from which contact with mobiles was maintained. W2KFV operated from Red Cross headquarters, with W2QBR relieving, and at c.d. headquarters W2JKX operated on 10 and W2KEB on 2, assisted by K2EQH.

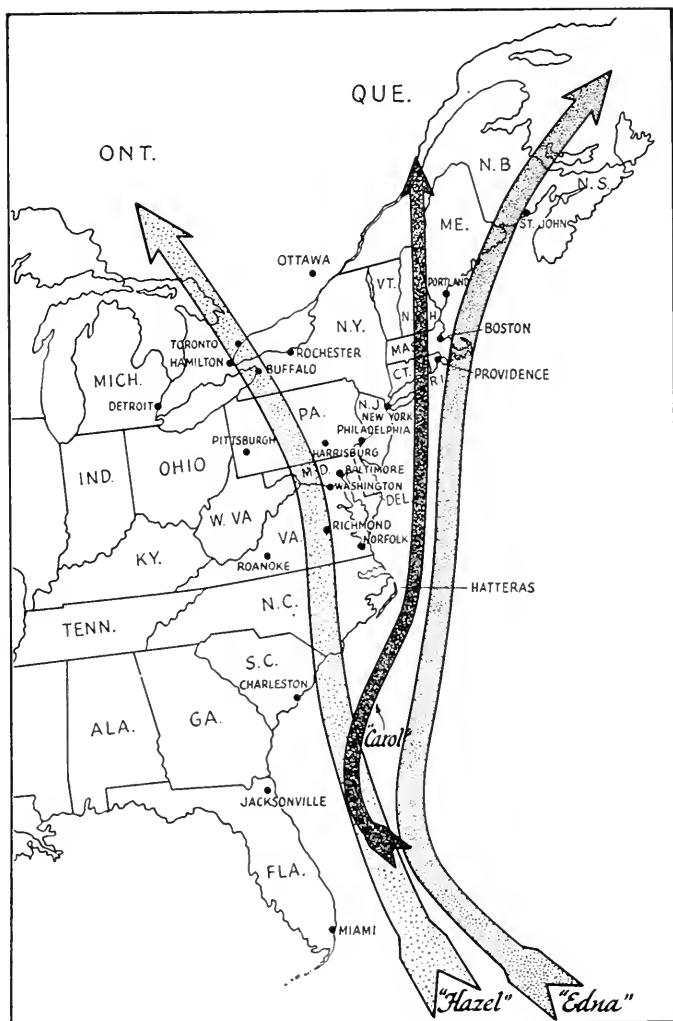
Contents of messages were such as reports of bridges out, trees down across highways, electric wires down, roads washed out and fire reports. The two-meter station at Red Cross was secured at 2135 after a message of commendation had been read from the disaster chairman. Mobiles in operation were W2s GCK GPQ KCW LLR VQI Y1L and K2EWB. Mobiles standing by were W2s DBI DUS KRP OME, K2s AXF and CCM. W2LBJ was in use as a fixed station. Other stations checked in and standing by were W2s ANN AZA KNA NRL QFH TUK UGF ZAI, K2s BGO BJG CNN and EAF. K2DHC was the call used at Nassau County c.d. headquarters.

At 1000 EDST on the morning of August 31st, W1VXL, the station of the Cranston Radio Association located at the Red Cross building, was put on the air by W1OGY as winds reached hurricane velocity in that area. Mobiles W1BTY, W1LZY and W1YKQ called in shortly afterward, en route to the club. When power failed, W1OGY assumed NCS duties from his mobile until W1VXL switched over to emergency power. By 1230 the Cranston Civil Emergency Net was in full operation with W1POP operating W1VXL and six mobile units out patrolling or standing by. A link on both 10 and 2 meters was established with W1AFO/1 at Cranston Police Headquarters. Other mobiles were W1s ZBZ and YRY. Others standing by were W1s JYF OOX RUS WUH ZPG and W1V1s BQB and YVW.

In the late afternoon, W1WSY, at state civil defense headquarters in Scituate and other RACES stations were activated on 2 meters with W1WKO coordinating information for this net from the governor's office. W1VXL and W1AFO/1 also established links with W1WSY and W1WKO. Operation was terminated about midnight. Accomplishments: many messages handled for the mayor and Cranston police; several trips to accompany Red Cross vehicles; handled Red Cross and other emergency traffic; picked up blood plasma, delivered it as

◆ This chart shows the approximate paths taken by the three hurricanes. In terms of damage, Carol exceeded Edna, but Edna was the largest in size, Hazel was the largest of all in both categories, and we'll tell you more about her in the next installment.

◆



directed. After the NCS had secured, W1s YKQ, LZV and YRY traveled in convoy headed by the state c.d. director to the southern part of the state to attempt a survey of damage and leave a portable generator at the Narragansett fire station to aid in setting up radio communication.

Amateurs in Hingham, Mass., under direction of EC W1MD, conducted fire patrol, since most of the city's telephones and fire-alarm circuits were out. The following amateurs participated in this activity: W1s AYG BIY DMS MD NMK SXN and W5HNW.

In the New Bedford area, W1AVY/1 was activated on 75 meters and W1WKM on ten. The following operators were on watch at these stations: W1s AEN\* AGG\* AVY\* AWH\* BMQ\* CTZ\* HPH\* LAZ\* MHN OH\* TZU\* UID WU\* WGN\* and ZPE\*. Those marked with an asterisk also operated mobile rigs when not on duty from one of the control stations. A total of 538 messages was handled to and from the area. New Bedford nets also tied into Fairhaven on ten meters, where about 15 mobiles were coöperating with local police and military.

The Cape Cod-Islands Emergency Net on 3912 did a very fine job restricting traffic for Cape and Islands. Other nets active were the Deep Sea Dragnet on 3970, Transcontinental Phone Net on 3970 and the Early Bird Net on 3845.

In Worcester, the RACES net was activated within a matter of minutes by Radio Officer and

EC W1SPF. Most of the damage suffered was from rain, although power was off over most of the city. Emergency power was supplied for c.d. headquarters by the ROTC at Worcester Tech. W1SPF reports 28 amateur radio operators on duty, plus four girls with restricted operator permits and 14 more waiting in reserve. The following are particularly to be commended for their work: W1NZD/m, who was the first to report; W1AET, who took net control; W1SPG for his fine work in relaying; and W1QCQ, who took over at W1YEW net control. Other amateurs participating in the order in which they made their appearance: W1s VDT LIB/m TJQ ONA/m SDU NZD/m UQL/m VLN/m AJV NNI/m UQW/m ZJW/m CS YPG RIL ZTL VPE/m SPG/m VGH CLU/m AAP/m JWM/m and VYK.

In Norfolk (Mass., that is), emergency operation was complicated by a prison break from the Norfolk Prison Colony. The hurricane hit its peak here at about 1500, August 31st, and took out all

means of communication other than radio. A gasoline-driven generating plant was set up at the fire station and the amateurs alerted. *W1s* WMN VQN BFV MJO and MGL responded, and MJO was dispatched to the state prison colony. *W1s* MNW, VQN and BFV were assigned to street patrol. At 2245 a report from the prison colony indicated two prisoners had escaped and were on the loose. This necessitated the setting up of road blocks and an even greater need for communications. The Norfolk gang were on duty for 48 hours without any sleep. EC W1CLF reports that the prison colony superintendent and the Norfolk police chief were high in their praise of the work done by the amateurs.

Carol's full force hit Haverhill about noon on August 31st, by which time telephone service was already partially disrupted. At 1245 W1SIX was set up at police headquarters and made contact with W1CCF/1 at c.d. headquarters, W1FW operating, and also with W1CCF/mobile in downtown Haverhill. By 1330 mobiles included *W1s* SNZ QYR QZS QGD NAG UHH and WN1ZUB, all cruising the city to report fallen trees and wires down. *W1s* WXE RYV WTK and WN1AFM came on later, all on a spot frequency of 147 Mc. With almost every road out of the city blocked by fallen trees and live wires, all mobiles had plenty to do. Fire-alarm and police signal systems were also out. The stations went off the air 0800 September 1st. Later, a fire patrol was set up tying various fire stations together and tying West Newbury, Mass., in with the Haverhill system. This set-up was in operation until September 15th.

The hams in Braintree became active starting at 1100 on August 31st, when W1VTH decided to activate W1TYN, the civil defense station. Thirty-three stations reported in, of which 22 were mobiles. At W1TYN, W1VTH was joined by W1VMU. As damage reports poured in, mobiles were dispatched to various locations, often accompanied by a policeman, to try to keep everything under control. Emergency power was necessary at 1206, and W1TYN was off the air until 1225. W1JOB relieved W1VTH and W1VMU at 1845, but VTH was back on the air from his mobile after a short rest and some chow. Also operating at W1TYN were W1QPH and W1OSX (Braintree c.d. Comms. Officer), and the station was on the air until 2250. Other amateurs participating in this area: *W1s* IA AUU EKG FQK JQA KJD KPX MPT OFO OKE RES RGS ROB SMC TQQ UYK VBB VPR WFQ WNT WSN YMV YYZ YZG YZP ZPI ZWQ.

In Framingham, W1MEG reports six mobile units in action: *W1s* WMT LPM RVA MEG WPW and QQW. In Lynn, EC W1JLN reports some of their mobiles went to Saugus and were received heartily. They helped patrol the town.

The situation was such in Arlington by 1030 that the town manager ordered the c.d. hams, the auxiliary police and the auxiliary firemen alerted. W1LXR and W1THO were the first alerted, and moved to activate the control station at the civil-defense director's office. W1WBX acted as net

control operator while W1LXR and W1THO began a mobile patrol of the town. W1LLY and W1CTW entered the mobile net during the afternoon. Meanwhile, the six-meter net went into operation jointly with the auxiliary police, looking for live wires on the ground. Mobiles were *W1s* BAQ CTW FWQ LLY LXR NBI THO VCZ and WYC. W1WBX and W1WYC alternated as control-station operators, and W1WBZ helped maintain equipment.

At the peak of the storm in Dedham, EC W1SH requested W1LYL to report to the police station to assist in getting the town's police transmitter back on the air, since power was off. W1LYL ran 200 feet of power cable from the basement to the transmitter on the top floor. The c.d. units were then able to operate on 10 and 2 meters. Returning to his home, LYL had to restore his own equipment to operating condition, to go into operation on 75 meters for ten consecutive hours. A big day's work for LYL.

In Winthrop, W1TTH and WN1BOX were first to recognize the seriousness of the situation and report to the control center. By 1030 the emergency generator was functioning. W1CMW also activated himself, and very shortly there were 10 stations on the air. Other self-activated stations were *W1s* VIS, UOC, and HFJ. Shortly after 1030 the power went off, and the emergency generator was put on the line to supply the entire building, including police radio control equipment, the state warning and emergency civil-defense equipment, lights, etc. W1TTH did most of the operating from the control center. The six-meter net was also activated and contact was maintained with Sector 4 headquarters in Newton throughout the emergency. The XYLYs helped out as operators during the hurricane and deserve a lot of credit. Both in daylight and at night, mobile units were used extensively, moving from place to place with reports of conditions, cooperating with police and fire units. Operators in this work were *W1s* UOC TTH HFJ BB and WN1BOX, with W1BDU at the control station. W1DJ manned the Cottage Hill unit and W1GGP made himself available at the hospital unit.

In Bedford, W1RSY was on the air within minutes after Carol was reported, and was joined by W1BFV, who was assigned to the Veterans Hospital, and by W1ACE/m who went to Hascomb Air Force Base. W1VCX was on stand-by from Maynard until his own area was alerted. When W1RSY lost both his tower and power, he got on from his mobile rig. C.d. headquarters was activated by W1YFP, and later joined by mobiles *W1s* VGC EIQ WAE and WME. *W1s* NAD and NDI drove to Acton to assist W1TRD who was operating alone there. Activity continued from 0900 August 31st to 0600 September 1st. *W1s* TCG UHV YEP and ZSG were also active.

### Edna

After the unorthodox behavior of Carol, Edna was tracked very carefully, both by the Weather Bureau and several amateur general-coverage



nets. But Edna, although larger and more ferocious than her predecessor, followed a more easterly course. Amateur networks were alerted and put to work all along the coast as Edna made her ponderous way northward, and indeed considerable damage was done in many coastal areas. This rampant female finally spent the last of her fury in the Canadian Maritime Provinces.

The Transcontinental Relay Net, operating on 7042 kc., and a special Hurricane Net set up on 3910 principally through the efforts of W1SS, followed the course of Edna very closely, relying principally on reports from amateurs in her way. TCRN was on the alert as soon as Edna was born, watching her closely as she moved north-eastward at first slowly, then with gradually increasing speed, staying a hundred miles or so off the East Coast. W4ATA was the principal source of information at first, and he gave the net several advisories until September 9th, when Edna started moving toward the Carolina coast; then W4LM of Charleston reported in to help, and later W4PHJ helped supply weather information. As Edna moved northward, TCRN not only kept track of her closely, but got stations all over the nation into the network to handle possible hurricane traffic. At 1215 EST W2BO reported that the hurricane was expected to miss most of New England, brush the tip of Cape Cod and pass out to sea from that point. As the storm went past the New England coast, W1LHA and W1DTB gave frequent reports, the latter indicating that the worst was over at 1900 EST. The following were logged by W3CVE as having participated: W1s ARR FEQ DTB ONX PJF YEJ LHA, W2s BO IH JOA, K2s AEQ BJS, W3WV, W4s PL ATA TKR LM VIIH UWE TYU PHJ WXL/4, W5s NRC GWT/4 RN ALZ CDP W6SWP W7CCL, W8s IZQ FUM DNC JWG, W9s SG GGG JUJ DUA UNJ SWM, W0s KA NAW, KP4s UH ZW, KL7ATO/W9 — and W3CVE, of course.

W1SS organized a Hurricane Net on 3910 kc. during Edna. Constant reports of movement of the storm, wind velocity and barometric pressure readings all along the coast from New Jersey to Nova Scotia were made available to the Associated Press, the United Press and the International News Service, as well as to the general public

Here's the operating position from which W1SS controlled the Hurricane Net on 3910 kc. That's W1SS himself in the middle, while W1UPZ gets the Weather Bureau on the telephone and an INS reporter takes notes on the operation.



and stations listening to the frequency. Due to experience in participating in emergency nets, the coordination and cooperation of all the 47 stations that comprised the net made for smooth and consistent operation. Actually, W1SS counted 131 stations reporting in at one time or another, including the following: W1s AFK AHX AWI AC AVY BNW BUD BLM CNX DKS ERG EKN EAB EHT FZT GGV GMH GIX HSC IAS JWV JOJ JN1 LYJ LBH LHZ LYD LBP LYV LOS MFI MBQ MAE MJD MLT NBP NCT NRZ OQT OKH PNR PCY PZY PAZ PRK QLL QU QHC QPU RYJ RNA RYX RMZ RGR SBP SAN SGL SAI SLW TOP TID TAY TFE TZL URR UDF UV UMC ULY USS URA VDB VXR VRM VTX VYI VRM VRT WGP WKI WNM WNK WLM YQV YLG ZNE ZNF ZCH ZJM ZEL ZET K1WAB K1FCR, W2s ACO BKC BTB CRX DMK EEO GKQ GTE GMW HJR ILI IVI MQB NKD NXZ QIH TXI ZOL ZZG, K2s AX AAO ADV BFD BDW CBU EF EOF EON GMV W3BHK W4NI K4AF, VE1s AAO DW VE2DW. Special thanks are extended to the stations that monitored the frequency above and below the net frequency and assisted in keeping the band clear.

The First Regional Net of NTS was in operation during most of the hurricane. W1TVJ started monitoring at 0650 EST Sept. 11th and officially opened the net for business at 0750. Eighteen stations reported in: W1s CRW/m USM CPV HUM RRX BY VGX LV ARR, W2s IVU AEE VNJ LJM JVG LPJ JOA, K2s DKM and BJS. W1BY took NCS during part of the day, while TVJ worked for his local c.d. At 1800 he reassumed NCS and the following additional stations were in the net: W1s KYQ OAK OHT RRX VVA W3WV VE1XB and VE3BJV. The Net was greatly hampered by bad conditions in the evening and W3WV assisted in relaying. At 2300 the net was closed, but TVJ continued monitoring until 0100. At 0740 on Sunday he was on the job again, and the following additional stations were QNI: W1s WCC POK IMY COC YAO VRQ QJM, W2s KHQ IFP, K2s HTX CQP DSL GAS, W3s BFF ONB W4IF, VE1s AEE WL. The net

was continuous until 2142 that night. W1VVA, W1WCC and W1CRW spelled TVJ as NCS at times. Close liaison was maintained with TCPN and the Maritime Net, and much traffic was expedited as a result. Special mention should be made of the fine work done by W1BY, W2JOA, W3WV, W1CRW (who operated from his mobile rig much of the time), W1WCC and VE1XB.



Emergency power units were mighty valuable during the hurricanes, and many AREC units remained on the air simply because they had their own, like the Winthrop organization. That's EC W1BB on the right, and W1AGB standing in the rear.

The New York State 'Phone and Emergency Net was activated at 1800 Sept. 10th and continued through to 1800 Sept. 11th with W2ILI as net control. Approximately 175 net members checked in on the net frequency of 3925 kc. In addition, the New York State Civil Defense Amateur Radio Service was activated and standing by on 3993 kc. with 30 stations ready, and v.h.f. nets on 6 and 2 meters were activated with about 25 members. Links were maintained with Albany and National Red Cross in Washington, also with the Hurricane Net and the New England C.D. Nets.

Damage in Rhode Island was less from Edna than from Carol, but the Cranston Emergency Net was active from 1910 Friday evening until 2155 Saturday at the request of the Red Cross. Net control station W1VXL was activated on 29.52 Mc. and in the 144-Mc. band. Mobiles alerted included W1s BTV LZY YKQ OGY ZBZ OOX and YRY. W1s SGA QLD and VAY called in and stood by during the evening. Mobiles were dismissed but on Saturday morning were called back into action. A fixed station was set up at the Red Cross evacuation center at Edgewood. W1VXL was operated by W1s POP BTV ZPG and OOX, and on two meters by WN1BQB and W1ZGH. W1AFO was operated at police headquarters. W1EWT and W1QOF provided a link with Providence. W1TQW also furnished a fixed link in downtown Providence and monitored the band for other stations and traffic outside the Cranston net frequency. At

the height of the storm all fixed stations operated on emergency power, and mobiles were on patrol duty. Official traffic was handled for the Cranston Police and the Red Cross. Other R. I. amateurs participating in the operation were W1s RUS RVO SGA BBN QLD MIJ JYF and OAV.

The amateurs in Lynn this time were able to do some collective good in their own city by setting up stations in the various firehouses. The frequency of 28,610 kc. was used. Mobile W1s WCB HRA QQL MHK OGG JZV were stationed at firehouses, SHV at Red Cross headquarters, VRK at the Medical Center and VHF at Lynn Hospital. At home rigs were W1s RLO LMJ VUH ZQL UKE YQF TBL DDI JKF VHE CTD and KLC. W1PBQ/m was in contact with Lynnfield civil defense, MCC/m with Salem civil defense and W1JLN/1 net control, operated by JLN and MTG.

In Dedham, W1LYL was again active. At 0820 on September 18th he was instrumental in dispatching mobile equipment from Brookline to New Bedford. Later, he followed the eye of Edna and relayed these reports to the Dedham c.d. office on 2 meters. Losing power at 1515, he operated mobile on 2 meters to report damage throughout Dedham as to road blocks, washouts and other damage.

The first station on the air in Winthrop was W1MQB, who kept an all night vigil on Edna's progress and estimated time of arrival. The net was alerted at 0700 Saturday morning and remained in operation until the danger from Edna was over. The following were also active: W1s DJ CMW OIR OUC HFJ/m BB BDU AGB/m TTH PBX and WN1BOX. Civil defense was prepared for evacuation, and a portable unit manned by W1TTH was ready for this purpose. Officials mobiling about town checking on conditions were kept in touch with the report center by means of WN1BOX/m on two meters. The Winthrop AREC was also able to provide an emergency generator for power for essential parts of the community hospital.

Hurricane Edna hit Haverhill on September 18th, and this time the gang was ready. W1CCF and W1FW were on stand-by at c.d. headquarters starting at 2200 on the 17th, other units coming on the air about 0800 on the 18th and staying in operation until midnight of that date. A unit was again set up at West Newbury, tying into Haverhill c.d. on 147 Mc. Merrimac was tied in on 28 Mc. with W1s HP REI and PIY on the air in that town. W1WTK restored an emergency generator which failed at the hospital. Haverhill operation during Edna was a continuation of its operation from Carol, and EC W1SIX sums up participants as follows: W1s SNZ RLT KBQ CCF SIX FW QYR WTK STA IWR MTS QQD QZS RYV QQG REI HP WNE NAG PIY, W1s ZKB AFM and ZUB.

The Framingham Radio Club Net was alerted Friday morning by W1MHC. The club's generator was set up at W1RXH, who took over as NCS on 28,700 kc. Framingham being headquarters for Mass. Civil Defense Region 3,

liaison was made between Framingham and W1UQW in Worcester on 29,560 kc., contacts being made by W1RXH and W1MEG/m. The following club member stations were activated: W1s RXH WMT/m MHC/m QQW/m MEG/m SQY/m WLJ WPW/m SRG MQU/m and JUL. Operation was terminated Sunday afternoon.

In Hamilton there were three stations active — one mobile, one emergency-powered and one control station: W1s YLQ TIN and LQQ respectively. W1YLQ and W1TIN were active on the Hurricane Net on 3859.

The Braintree gang was again active during Edna. A total of 20 mobiles turned out to patrol the streets, reporting conditions almost as they occurred to the police, street, electric and fire departments. The mobiles assigned to assist the electric company's crews were especially active. W1VTH and W1ZSZ set up a fixed radio station inside the electric plant to act as net control for the repair crews. Many of these operators served around the clock. During the week end seven amateurs with a combined operating time of 41 hours served as net control operators: W1s SSA OSX CTR JOB EKG VTH and ZSZ. The following operated as mobiles: W1s JQA KJD KPX MPT OSX OFO QPH RRP ROB SSA TQQ UXN VMU VBB VTH YMV YYZ ZPI and ZSZ. Others serving in various capacities were W1s AUU IA ISU KWD LZB LJT MMH QVN QPT SAI VYI WNT YKS ZSU ZYG.

The Bedford gang turned out for Edna as they did for Carol, and again assisted the Bedford civil defense in maintaining communication. EC W1RSY showed up at c.d. headquarters at 0600 on Saturday and activated the control station, setting up communication with Brookline, Concord, Hingham and Lynnfield. Later, additional help showed up in the persons of W1s TCG ZSG NAD SAP YFP. Operating home stations were W1s ACE BFV VGC and RSY.

Up in Manchester, N. H., the Hillsborough County Emergency Net went into operation at 1200 on September 11th under net control W1YIH on 29 Mc. The net covered all locations throughout the city to provide communications with c.d. headquarters. The net remained in operation until 1820. Mobiles in action were W1s WUG RGC RYC URL YVN TXN and KYG. Others active were W1s EIQ KYX MSJ QJB QZV RSV TRD VCX WIZ WNB ZHN ALX KEK LEH MFY NCO PDQ PFN PIU QNC RAL RES RIL SLM SSA TYN UYK VBC VEL VIA WAE WNE YKD YXN ZL ZPL. Fixed stations were W1s YHI ZIZ BRY RET QJY YJD WUR and WUU. ZIZ set up his station at c.d. headquarters in the northern sector of the city, and W1WUU set up at Moore General Hospital in Grasmere.

Edna only sideswiped these areas, but the Canadian Maritime Provinces felt her full force. Saturday afternoon, Sept. 11th, found New Brunswick net control VE1PF sending out storm warnings and weather reports. By 1900 the 3750 kc. channel was so congested that the New Brunswick and Nova Scotia groups divided, the

former going to 3740 and the latter to 3770 kc. Yarmouth was the first to feel the brunt of the storm, and shortly after 2100 VE1DW and VE1ACE were the only amateurs being heard from that area, the latter mobile and the former on emergency power. Most of the power was off at Yarmouth, and VE1ACE patrolled the town in his mobile reporting wires down, fallen trees, etc. VE1DW was in contact with VE1FQ at Halifax, which station was also on emergency power. VE1PT was patrolling the Halifax suburbs and passing damage information to VE1FQ. Assisting at VE1FQ were VE1OM and VE1LZ. Skip washed out contact toward morning, despite efforts of W2SAI to help in relaying, but operation was resumed at 0700, by which time the storm had moved to the Gulf of St. Lawrence and other stations in that area were beginning to call in. Main bulk of traffic handled on Sunday consisted of telephone and power line



During Edna, EC W1JLN set up at Fire Alarm headquarters in Lynn, Mass., and acted as NCS for the net on 28,610 kc. Operating was done by W1JLN (seated, rear) and W1MTG. (Photo by Lynn Daily Evening Item)

damage, press releases, weather reports, movements of goods and military. Assisting at VE1FQ on Sunday were VE1s WL HC and LZ. VE3NG assisted in maintaining contact with Toronto. Other stations participating were VE1s NZ/m KK MY FG BW WB ABT ACW MX FM MT SI OC FN RF ED PB BB RL ABP WK PD NA TF VN DF PF ADU and UT.

EDITOR'S NOTE: The second part of this article, the story of amateur radio's participation in Hurricane Hazel, will appear in a future issue of QST.

# Happenings of the Month

## ELECTION RESULTS

Recent balloting in ARRL elections has resulted in the selection of four new directors and three new vice-directors to take office January 1st.

**Harry M. Matthews, W9UQT**, becomes the new director of the Central Division, with 999 votes, defeating Myron Hexter, W9FKC, with 552 votes, Edmond A. Metzger, W9PRN, with 505 votes, and Charles F. Reberg, W9MVZ, with 435 votes. A radio operator and technician with the Illinois State Police at Springfield, "Doc" Matthews has a long history of club work behind him. He has served in all the offices of the Central Illinois Radio Club, and also as president of the Sangamon Valley Radio Club. He organized the Illinois Emergency Net, and has been a director assistant and vice-director. He is an AREC member and PAM.

The new director of the New England Division, **Philip S. Rand, W1DBM**, won handily with a tally of 1636 votes to 490 for Frank L. Baker, W1ALP, and 259 for John L. Thompson, W1BIH. As ARRL Technical Consultant, "Phil" conducted the League's early TVI demonstrations and his work in the field gives him the second name of "Mr. TVI." He received a special citation under the first Edison Award, and was chosen for ARRL's first Merit Award plaque in 1953. He is radio officer for Connecticut Area One C.D., and EC for Fairfield County, and a member of IRE, AREC, and an OPS. Club work includes the founding and first presidency of the Amateur Radio Emergency Corps of Norwalk, Conn., and presidency of the Falmouth (Mass.) Radio Club. He is an electronic engineer at Remington Rand.

A former vice-director and SCM, **Clayton C. Gordon, W1HRC**, becomes the new vice-director of the New England Division with 1617 votes to 745 votes for Ira J. Hemingway, jr., W1HUM. "Clay" has served as vice-president and treasurer of the Providence Radio Association and president and vice-president of the Pittsfield Radio Club. He is employed as a transmission tester in the long lines department of A. T. & T. in Pittsfield, Mass. He holds ORS, OPS and A-1 Operator Club certificates.

With 900 votes, **Walter R. Joos, W6EKM**, nosed out Raymond E. Meyers, W6MLZ, with 860 votes, to become director of the Southwestern Division. Director Joos, a salesman for Johnson, Carvel and Murphy, food products representatives, Los Angeles, just concluded four years as vice-director of his division. His club work includes the past offices of president, vice-president, and secretary of the Inglewood Amateur Radio Club.

For vice-director of the Southwestern Division, **Robert E. Hopper, W6YXU**, polled 1060

votes to the 694 votes of Roger D. Mace, W6RW. Vice-director Hopper is employed at the U. S. Navy Electronics Laboratory, San Diego, as a technician. For the past four years he has been a director assistant. He has served as president of the San Diego Amateur Radio Club, and as Chairman of the Southwestern Division Convention in 1949 and 1952.

**Robert E. Cowan, W5CF**, becomes the new director of the West Gulf Division with 732 votes, defeating incumbent A. David Middleton, W5CA, with 684 votes, and Charles Fermaglich, W5FJF, with 401 votes. W5CF is employed as manager of the Ralston Purina Company's Fort Worth plant, and is active in civic and city governmental work. He is a charter member of the Kilocycle Club of Fort Worth, a member of Air Force MARS, and AREC.

**John F. Skelton, W5MA**, becomes vice-director of the West Gulf Division with 1322 votes to 473 votes for Richard L. Hawkins, W5FEC. W5MA is division manager of the central division of Texas Power and Light Co., and has been a director of the Dallas Amateur Radio Club and chairman of the TVI Committee. He is well known as coauthor of "The Dallas Plan for TVI."

## TECHNICIAN CLASS FILING

As explained in detail in last month's editorial, the Board of Directors of the League has heartily endorsed the FCC proposal to open the 50-Mc. band for the use of Technician Class amateur operators, but has been obliged to oppose the similar opening of 144 Mc. on the grounds it would defeat the original purpose in increasing 6-meter occupancy. The text of the League's filing with the Commission follows:

### FEDERAL COMMUNICATIONS COMMISSION Washington 25, D. C.

In the Matter of Petitions for amendment of Part 12, Rules Governing Amateur Radio Service, concerning Technician Class operator privileges.	}	DOCKET NO. 11157
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### COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INC.

Pursuant to Paragraph 6 of the Notice of Proposed Rule Making in Docket 11157, the American Radio Relay League files these comments on behalf of the more than 45,000 U. S.-licensed amateur radio operators who are members of the League.

These comments were formulated after extensive deliberation by the ARRL Executive Committee and subsequent vote by the elected Board of Directors of the League.

\* \* \*

The League concurs in the proposal to open the 50-Mc. band to amateur licensees of the Technician Class, but opposes the proposal to open the 144-Mc. band for those licensees.

#### *As to 50-Mc. Technician Use*

Some time prior to the release of the present Notice by the Commission, the Executive Committee was in the process of examining an independent proposal received through League channels that the 50-Mc. band be opened to Technician Class licensees. The Committee rendered a report unanimously in favor of such a proposal, which was thereupon confirmed by the Board of Directors. Meanwhile, the Commission released its own proposal. Thus the League heartily endorses that portion of the present Docket which proposes to open the 50-Mc. band to Technician Class licensees.

In this respect the League concurs with the Commission's belief that "greater occupancy of, and experimentation in," the 50-Mc. band is desirable. We believe that the pattern of occupancy of an amateur band, particularly one above 30 Mc., depends to a considerable extent upon beginner interest in such band. Beginner interest above 30 Mc. has in recent years been concentrated in the 144-Mc. band, with little or none shown in 50 Mc. The League believes that it is necessary to take special steps to promote beginner interest in the 50-Mc. band, and urges the adoption by the Commission of this aspect of the proposal.

#### *As to 144-Mc. Technician Use*

With the issuance by the Commission of the present Notice, proposing that Technicians be permitted also on 144 Mc., the League again carefully examined the matter, particularly as to the overall effect of the combined proposals, and both the Executive Committee and the Board of Directors voted in opposition to the proposal. Thus the League is obliged to oppose the proposal to open the 144-Mc. band to Technician Class licensees.

The League's examination of the proposal fails to disclose any compelling reason for its adoption. Occupancy of the 144-Mc. band is not a problem. Since the war this band has had its proportionate share of amateur use. With the opening of a substantial segment of it for use by Novice Class licensees, in 1951, occupancy has increased to more than an adequate level. This band now has suitable beginner interest, which we have stated we believe is so necessary to continued occupancy. Thus we see no immediate need for regulatory action to promote usage of the band.

Nor does the League's examination of the proposal enable it to agree to the argument that its adoption would increase participation in the Radio Amateur Civil Emergency Service. Under RACES rules, station authorizations may not be issued to the holders of Technician Class licensees. Thus adoption of the proposal would not increase the number of stations available for civil defense communication under RACES. The value of the Technician Class licensee to civil defense communications lies, of course, in operator availability. In this respect the League notes it is already provided in RACES rules that Technician Class licensees may obtain authorizations to operate in that service, using designated segments not only to the 50-Mc. band but *any* RACES band segment. Thus the League does not see any specific advantage to civil defense communications by adopting the proposal under discussion.

The League believes that adoption of the proposal would certainly hinder, if not actually negate, the stated aim of obtaining more occupancy also in the 50-Mc. band. Should both bands be opened to Technician Class licensees, in the League's opinion such licensees would congregate on 144 Mc. almost to the exclusion of 50 Mc. This is for the reason that occupancy tends to promote occupancy, and such newcomers would be drawn to the band of greater occupancy. Further, obtaining equipment for the 144-Mc. band is a much simpler problem than for 50-Mc., both in respect to commercially-available units and surplus equipment. The only result would be greatly-increased occupancy of the already-populated 144-Mc. band and little — or, more likely, no — increase in 50-Mc. activity. This would obviously prevent the fulfillment of the objective, common to the Commission and the League, of encouraging greater occupancy of 50 Mc. It is primarily for this reason the League is obliged to oppose the 144-Mc. aspect of the proposal.

Though of lesser importance, the League also comments that adoption of the proposal would appear to make the Technician license rather too attractive. It is the League's view, and one which we believe is also shared by the Commission, that incentives should be provided for amateurs to progress to higher grades of license. In the case of the

Novice, this is adequately handled by the one-year license term. In the case of the Technician, the primary incentive is frequency privileges. In areas where there is extensive v.h.f. activity there are hundreds of newcomers who will be perfectly satisfied with Technician status if they can work on all frequencies from 50 Mc. up. There is a considerable number of amateurs today of Conditional Class, or higher, already devoting their entire time to v.h.f., and perfectly content to do so. They very likely would never have bothered to obtain their present class of license had all the privileges above 50 Mc. been available to them with a Technician authorization.

Summing up, the League believes it to be not in the best interests of the amateur service to open the 144-Mc. band to Technician Class licensees, because there is no valid objective to be accomplished, because such action would negate the desirable objective of populating the 50-Mc. band, and because such action would also have the undesirable effect of removing, to a considerable extent, incentive to progress to a higher grade of license.

AMERICAN RADIO RELAY LEAGUE, INC.

By PAUL M. SEGAL  
*Its General Counsel*

A. L. BUDLONG  
*Its General Manager*

November 15, 1954

## EXAMINATION SCHEDULE

The Federal Communications Commission will give Extra and General Class amateur examinations during the first half of 1955 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. *Even stated dates are tentative and should be verified from the Engineer as the date approaches.* No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted. (Novice, Technician and Conditional exams are given only by mail. See page 50, May 1954 *QST*, or the *License Manual* for details.)

Albuquerque, N. M.: April 2.  
Amarillo, Texas: March 25.  
Anchorage, Alaska, 53 U. S. Post Office Bldg.: By appointment.  
Atlanta, Georgia, 411 Federal Annex: Tuesday and Friday at 8:30 A.M.  
Baltimore 2, Md., 500 McCawley Bldg.: Monday through Friday. When code test required, between 8:30 A.M. and 9:30 A.M.  
Bakersfield, Calif.: Sometime in May.  
Bangor, Maine: May 18.  
Beaumont, Texas, 329 P. O. Bldg.: Monday through Friday except Thursday only when code test required.  
Billings, Mont.: Sometime in May.  
Birmingham, Ala.: March 8, June 8.  
Boise, Idaho: Sometime in April.  
Boston, Mass., 1600 Customhouse: Wednesday through Friday 9:00 A.M. to 2 P.M.  
Buffalo, N. Y., 328 P. O. Bldg.: Thursday.  
Butte, Mont.: Sometime in May.  
Charleston, W. Va.: Sometime in March and June.  
Chicago, Ill., 826 U. S. Courthouse: Friday.  
Cincinnati, Ohio: Sometime in February and May.  
Cleveland, Ohio: Sometime in March and June.  
Columbus, Ohio: Sometime in January and April.  
Corpus Christi, Texas: March 10, June 9.  
Dallas, Texas, 500 U. S. Terminal Annex Bldg.: Monday through Friday, except Tuesday only when code test required.  
Davenport, Iowa: Sometime in January and April.  
Denver, Colo., 521 New Customhouse: 1st and 2nd Thursdays, 8 A.M.

(Continued on page 130)



# Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

## V.H.F. BURSTS

Thayer School of Eng.  
Dartmouth College  
Hanover, N. H.

Editor, *QST*:

I don't know whether or not you have heard from Dr. deBettencourt, but Edward P. Tilton's paper, "1000-Mile Burst Reception on 144 Mc. by Radio Amateurs," was duly presented at the XIth General Assembly of URSI at the Hague. Sir Edward Appleton, president of International Commission III, was chairman of the session in which the presentation was made, and he said that all of the bursts looked like meteors to him. Dr. G. Millington of Marconi's Wireless Company presented Mr. G. A. Isted's work on the correlation of v.h.f. bursts with lightning strokes, and suggested that some of the longer bursts on the tape might be this phenomenon. I mentioned that you were already on the trail of this matter and Appleton was most impressed with the fact that amateurs in the United States would be aware of such recent work. He asked that the Commission's highest commitments be conveyed to W4JHK, to W2UK, and to W1HDQ for such high caliber work being carried out by amateurs.

— *Millet G. Morgan, W1HDA*

## RTTY ELECTION RETURNS

WNYC/WNYC-FM  
New York, N. Y.

Editor, *QST*:

I wish to express my thanks for the fine work done by all concerned in transmitting by amateur radio the election returns for broadcast by the Municipal Broadcasting System.

The information collected and forwarded (by John Williams, W2BFD, and his fellow operators) was received at a central point in Manhattan and relayed from there by amateur radioteletype directly into the studio from which the broadcast originated.

Due to their good work, we were able to disseminate these returns about two hours ahead of commercial services.

It is jobs like this, well done, which bring to public attention the accomplishment of amateur radio.

— *Seymour N. Siegel, Director*

## FAMILY CIRCLE

8157 Harper Ave.  
Chicago 19, Ill.

Editor, *QST*:

Bet you are getting quite a chuckle out of the feud between the various groups whose interests seem to be at variance with each other. I've wondered, reading the letters, if it has ever occurred to each group how interdependent we are on each other, really.

To those who love to build gear is due the credit for much of our technical advancement, but if it weren't for those who love to operate, what good would advancement be? If no one wanted to operate, except to test, what use could be found for new circuits and equipment?

The ones who prefer net operation to free-lancing make possible the traffic handling which has been a major item in the justification of our amateur service. However, if it weren't for the free-lancers, no one would have developed the VFO.

If the bands hadn't been crowded, no one would have bothered to figure out the crystal filter, and if no one had been interested in "just operating" there would have been no one to use it.

If everyone built their gear and no one bought it, we would not have the advantage of manufacturers' research, and that is certainly nothing to be sneezed at. You don't

sneer at the man who drives a Cadillac just because he didn't build a homemade car and use it instead.

The boys who brag about their design abilities seem to forget that radio has already been invented, and they are largely making improvements in design rather than originalations, while the operators who razz the builders forget that their gear is the outcome of builders' ideas.

And so it goes, all through the picture. Each would be a total loss without the other. The boys who knock c.w. should try to handle traffic through heavy QRN and QRM, while those who knock 'phone should consider how it expedites the exchange of intelligence when conditions are right. One could go on and on, but this gives you the idea. We're really just one family!

— *Ralph C. Cole, W9LCC*

## V.H.F. FOR C.D.

9330 TSU Ord., Det. B  
Redstone Arsenal  
Huntsville, Ala.

Editor, *QST*:

After each and every situation where emergency traffic is handled by amateurs I read the comments and complaints about stations failing to clear the emergency net frequencies and interfering with communications in general.

Here again is the time to consider the further exploitation of v.h.f. bands for practically all emergency communications. The state of the art has progressed to the point where the reliability and range of v.h.f. equipment even exceeds that of the lower-frequency units of equivalent power under most conditions. In the original organization of many nets, emphasis was placed on the use of existing equipment among the members. This fact dictated the use of the so-called "popular bands." As time progresses it becomes more important to turn attention to more effective equipment designed with civil defense, etc., specifically in mind for more permanent installations. This to me means v.h.f.

— *Rutherford L. Ellis, Jr., W4LNG*

## DX MANNERS

1414 Oakley St.  
Orlando, Fla.

Editor, *QST*:

Oh, what lousy manners 20-meter DX hounds have. Why can't these gentlemen stop frothing at the mouth and wait? To hear some of them you'd think that the only way they will ever be satisfied to QSO a foreigner is to break up his QSO with someone else.

As a victim of the DX hunter's cunning, I speak! How many good ones have been snatched from my trembling grasp by some scheming American? Ouch, boys, pleez. You can wait!

— *Arthur M. Hale, W4TVQ*

## HAWAIIAN PARADISE

P. O. Box 1748  
Lihue, Kauai

Editor, *QST*:

In conversing with U. S. hams plagued with TVI and BCI, they frequently have expressed their desire to be in some place like Hawaii.

Far from being a dreamy South Pacific isle, Hawaii has 13 standard broadcast stations, 3 TV stations, and 3 f.m. stations, not to mention high-powered communications facilities by the major communications companies, CAA, Army, Navy, and electronic navigational facilities serving the entire Pacific.

So, you see, it is not all hula girls and pineapples in Hawaii.

— *K. Nose, K116J*

(Continued on page 138)



# YL NEWS and VIEWS

BY ELEANOR WILSON,\* W1QON

## Well-Groomed YLs

Look to your dressing table . . . your manicure set is more valuable than you may realize!

In the General Electric Company's service publication, "Techni-Talk," radio serviceman L. A. Frankel of Astoria, N. Y., reveals that milady's manicure set can serve as a tool kit in the field of radio repair. A filed-down orange stick makes a good nonconductive screwdriver. Emery boards and nail files can clean connections to be soldered. Use nail polish for color-coding or cement, nail polish remover as a plastics solvent. Nail clippers can cut and strip small wires, and tweezers can pick up tiny parts dropped inside the set or hold small parts in place for work within cramped confines.

Wonder what useful purpose false fingernails would serve?

## 'XYL' or 'MYL'?

Wives of thirteen members of the East Bay Radio Club (Oakland, Calif.) have protested the use of the term "XYL." They suggest that unlicensed wives of hams be referred to as "MYLs"—married young ladies. This renews an unsettled discussion scanned in this department several times previously.

The complications are increasing, though. "MYL" is the term most frequently offered as a substitute for the popular but inappropriate epithet "XYL"—both terms denoting the unlicensed wife of a male amateur. However, if we consider the merit of W1YN's suggestions as given in the January, '54, column, an "MYL" would be a married female amateur with license. (Betty's complete offering: "YL"—single woman with license; "MYL"—married woman with license; "SYL"—single woman without license; "XYL"—married woman without license.)

What will be the fate of our time-honored "YL" and "XYL"? Let's hear from interested parties and find out.

\*YL Editor, QST. Please send all contributions to W1QON's home address: 318 Fisher St., Walpole, Mass.

Last October, 18 YLs from six states braved some nippy weather to carry out picnic plans at Big Meadows on Skyline Drive, Virginia. The girls are members of the YLRL net conducted by W4HLE, Arlie, which meets Tuesdays on 3900 kc. at 0800 EST. (L. to r., top row): W4BQI, W4DBP, W4AJV, W3YWK, W3QQF, W4WJX, W4TVO, W3MSU, W4KYI; (seated) W3RNJ, W4RIG, W1UKR, W4HLE, W1VOS, W3TYC, W4YYJ, W4BLR and W3TSC also attended.

January 1955



When Captain "Stay-put," W2XMM/MM, of *Flying Enterprise* fame (see p. 36, March 1952 QST) is on the high seas, it's nice to have the home station in operation. Captain Kurt Carlsen's two young daughters, Sonia (left) and Karen, are now KN2IVT and KN2JAT, respectively. (Photo courtesy E. D. Collins)

## 80-Meter C.W. Net

A new 80-meter c.w. net for all YLs is announced by YLRL Vice President W6KER. The net meets Mondays on 3680 kc. at 2100 PST. NCS is W7GLK. The October issue carried the complete schedule of nets listed with the YLRL.

## Keeping Up with the Girls

W1RJY, Esther, is happy to have her long-sought DXCC certificate. . . . W2EEO, Madeline, and OM W2CYK had a nice write-up in an article entitled "W2CYK Calling," which appeared in the August '54 issue of *Hardware Retailers*. . . . W1YYM, Ellen, finds it pays to start the day early. At 0530 EDT one morning she greeted VK1AC on Macquarie Island, good DX in anyone's log. . . . Allowed the use of a room in the Physics Building at Ohio Wesleyan University where she's a freshman, W8OSD, Virginia, daughter of W8SPC, Helen, operates portable with her Johnson Ranger. So long as high grades are maintained, the physics department doesn't mind the arrangement. . . . W6KER, Gilda, was instrumental in obtaining a pump organ to send to W7ROZ, Father Clem, for one of the churches in his 10,000 sq. miles of territory in King's Canyon, Ariz. . . . Teacher of a number of young girls who earned ham tickets, it was a thrill for W9MGT, Leonore, to have her mother become WN9KJF (Irene). . . . K2CLC, Barbara, has joined MARS along with her dad, K2BWQ. . . . W7OOY, Jeannine, has been appointed chairman of the YLRL Seventh District, replacing W7SBS, who resigned. . . . W5s SYL, Iva, WXY, Bernice, and YKE, Martha, helped relay some 300 messages at the Dallas Fair. . . . W9SEZ, technical instructor and code teacher for the Chicago YLRL Unit, is currently coaching nine students

(Continued on page 136)





# Hints and Kinks

## For the Experimenter



### BETTER AUDIO WITH THE MONITONE

AFTER recent completion of a Monitone, it was discovered that the audio quality was somewhat distorted at normal settings of the receiver gain control. The received signals sounded chopped or clipped at the audio level I prefer to use. This condition was quickly remedied by the substitution of a 6SN7GT for the 6SL7GT recommended for the circuit. No component or wiring changes are required by the new tube.

— Dick Bourne, W1TVJ

### USING A CARPENTER'S BRACE AS A WRENCH

A CARPENTER'S BRACE makes an especially good "wrench" for turning the square-head cap screws used to tighten chassis punches. Frequently, when the corners or other hard-to-get-at places of a chassis are being tackled, it will be found that a brace is a more convenient tool to use than a regular flat wrench. Furthermore, the ratchet feature of the brace will make the job as easy as would be the case were a ratchet-type socket wrench employed.

— Rev. Jos. A. Terstegge, W9LQE

### INEXPENSIVE FEEDER SPREADERS

PLASTIC clothespins, a product of Vermont Plastics, Inc., are available at many variety stores at a cost of approximately three cents each. Easily disassembled, each provides two spreaders for open-wire lines. One hole already exists in the improvised spreader, and the other can be drilled to provide two-inch spacing.

— D. B. Angel, W8DBF

### THREE-BAND OPERATION WITH A 7-MC. GROUND-PLANE ANTENNA

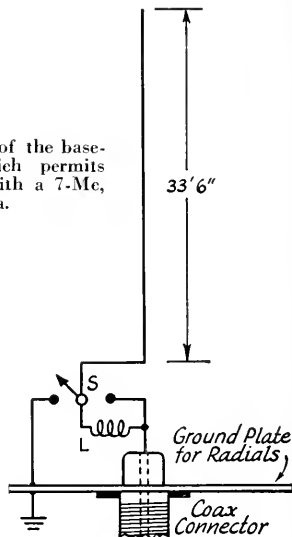
BECAUSE of the growing popularity of the quarter-wave vertical, especially on 7 Mc., it may interest some of the gang to learn that this antenna can be made to do a fair job at 3.5 and 21 Mc. also. The method used to obtain 3-band operation here at W3NWA is shown in Fig. 1.

In the diagram, *L* is a loading coil used when the antenna is operated at 3.5 Mc. When the s.p.d.t. switch, *S*, is in the neutral position, it connects *L* in series with the radiator and the RG-8/U transmission line. In one of the closed positions the switch shorts the coil, permitting normal 7-Mc. operation of the system. The antenna will also take power at 21 Mc. when the loading coil is shorted out. In the third position,

the switch connects the vertical to the grounded radial support to provide lightning protection.

In the original installation, the Premax whip was adjusted to favor operation at the low end of the 7-Mc. band. The loading coil used to resonate the system at 3550 kc. consists of 22 turns No. 12 enameled, 2½-inch diameter, 4 inches long. The

Fig. 1—Drawing of the base-loading system which permits 3.5-Mc. operation with a 7-Mc. ground-plane antenna.



coil was cut from a 10-inch length of commercial stock which had been temporarily installed intact and then tapped experimentally during the initial stages of testing. A grid-dip meter may be used to help resonate the coil, provided the feed point (the coaxial connector shown in Fig. 1) is connected to the grounded radial support.

A liberal application of Duco cement along the existing support bars for the air-wound coil will provide added strength to the assembly. One coil so treated has been exposed to the weather for an entire winter with no apparent ill effects.

In actual operation at 3.5 Mc., good reports have been received from all over the eastern part of the U. S. A., using 100 watts on c.w. Reports are consistently better than formerly received while using a random-length horizontal wire, probably due in part to the low-angle radiation from the vertical. The s.w.r., while not as low as on 7 Mc. (using the same RG-8/U feeder), is not high enough to cause trouble, provided operation is limited to a 100-ke. band centered on the frequency for which the loading coil has been resonated.

— R. E. Young, W3NWA



8th V.H.F. Sweepstakes, Jan. 8th-9th

ARRL Certificates to Leaders; Gavel to Top Club

THE Eighth Annual V.H.F. Sweepstakes, open to all amateurs who can work 50 Mc. or higher, will offer the v.h.f. enthusiast unparalleled opportunities for new DX records, additional states, and meeting new friends. The contest period starts at 2:00 P.M. your local time, Saturday, January 8th, and continues to midnight, Sunday, January 9th.

Just call "CQ Sweepstakes" on 'phone or "CQ SS" on c.w. to get in touch with other contestants, then exchange SS data as shown elsewhere in this announcement. This information is similar to a message preamble, with the ARRL section (see page six of this QST) substituted for the city and state, and the RS or RST report for the "check."

Make contact with as many stations as possible. (You can rework a station for credit on other v.h.f. bands, so ability to work several bands pays off in score points.) When an exchange of SS "messages" has been completed in both directions, two points may be claimed.

To figure your score, multiply total contact points by the number of different ARRL sections worked. You may use 'phone, m.e.w., or c.w., with results all contributing toward one score.

Certificate awards will go to V.H.F. Sweepstakes top-scorers in each of the 73 ARRL sections from which entries are received. In addition,

a certificate will be given to the top Novice or Technician in each section where at least three such licensees submit valid contest logs.

Clubs, especially, are urged to get their members on the air from their individual stations to compete for the certificates which go to leading club operators. The club whose members accumulate the top aggregate score will also receive a cocobolo gavel with a sterling-silver band engraved with the name of the winner.

Contest reporting forms are now available from the ARRL Communications Department and will be sent free upon request. If you don't use these forms, please follow the log arrangement shown. ARRL welcomes all contest reports to assist in cross-checking and to make complete results in QST possible. Novices and Technicians: be sure to report your totals, large or small, so that the license-class leader in your section will qualify for a certificate.

The 1954 V.H.F. Sweepstakes smashed all v.h.f. activity records before or since, with an unprecedented 610 stations reporting. The SS coming up may well be bigger yet. Why not give your v.h.f. set-up a check? In this one January week end, you'll be able to tell more about how your equipment and antennas are functioning than in months of casual operating. Plan now to take part! (Rules on following page.)

STATION W. . . . — SUMMARY OF V.H.F. SWEEPSTAKES EXCHANGES

Freq. Band (Mc.)	SENT (1 point)				Time ..ST	Date (Jan.)	RECEIVED (1 point)				Time	Date (Jan.)	Number of Each Different New Section as Worked	Points
	NR	Stn.	CK- RST	Section			NR	Stn.	CK- RST	Section				
50	1	W1AW	57	Conn.	4:15 P.M.	8	3	W1PHR	47	Conn.	4:18 P.M.	9	1	2
50	2		43		4:35 P.M.	8	7	W1HDQ	59	Conn.	4:40 P.M.	9	..	2
50	3		58		9:09 P.M.	8	6	W1TAM	359	Maine	9:11 P.M.	9	2	2
144	4		49		9:30 P.M.	8	32	W1OOP	58	E. Mass.	9:36 P.M.	9	3	2
144	5		57		9:50 P.M.	8	15	WN1CGG	58	Conn.	9:46 P.M.	9	..	2
50	6		54		11:30 P.M.	8	11	W2AOC	48	N. Y. C.-L. I.	11:32 P.M.	9	4	2
420	7		58		11:35 P.M.	8	30	W1PHR	57	Conn.	11:35 P.M.	9	..	2
144	8		57		11:45 P.M.	8	21	W3LMC	59	Md.-Del.-D. C.	11:56 P.M.	9	5	2
144	..		..		..	..	18	W9QXP	59	Ill.	12:34 A.M.	10	6	1
144	9	W1AW	34	Conn.	8:50 A.M.	9	27	W1RFU	59	W. Mass.	8:47 A.M.	10	7	2
50	10		479		9:18 P.M.	9	12	W5NHB	379x	S. Tex.	8:20 P.M.	10	8	2
50	11		589		10:40 P.M.	9	20	VE1QY	569	Maritime	11:35 P.M.	10	9	2

Bands Used: 50, 144 and 420 Mc.

9 Sec., 23 Pts.

Number and names of operators having a share in above work. ....

Claimed score: 23 points × 9 sections = 207.

Participating for club award in the .....

(name of club), of which I am a member.

I hereby state that score and points set forth in the above summary are correct and true.

Tubeline-up. ....

Signature. ....

Number of QSOs. ....

Address. ....

## EXPLANATION OF V.H.F. SS CONTEST EXCHANGES

<i>Send Like Standard Msg. Preamble</i>		<i>NR</i>	<i>Call</i>	<i>CK</i>	<i>Place</i>	<i>Time</i>	<i>Date</i>
Exchanges	Contest numbers 1, 2, 3, etc., a new NR for each station worked		Send your own call	CK (Readability and strength or RST of station worked)	Your ARRL section	Send time of transmitting this NR	Send date of QSO
Purpose (example)	QSO NR tells how you are doing (NR1)		Identification (WIAW)	RS or RST report (589)	See page six for section list (Conn.)	Time and date must fall in contest period (6:55 P.M. Jan. 9)	

### Rules

1) *Eligibility:* Amateur operators in any ARRL section (see page 6) operating at home, or mobile or portable under one call on or above 50 Mc. are invited to take part.

2) *Object:* Participants will attempt to contact as many other stations in as many ARRL sections as possible.

3) *Contest Periods:* The contest starts at 2:00 P.M. your local time, Saturday, Jan. 8, 1955, and ends at midnight, Sunday, Jan. 9, 1955.

4) *Exchanges:* Contest exchanges, including all data shown in the sample, must be transmitted and receipted for as a basis for each scored point.

5) *Scoring:* (a) Contacts count *one point* when the required exchange information has been received and acknowledged, a *second point* when exchange has been completed in both directions.

(b) Final score is obtained by multiplying total contact points by the number of different ARRL sections worked (the number in each of which at least one SS point has been credited).

6) *Conditions for Valid Contact Credit:* (a) Repeat contacts on other bands confirmed by completed exchanges of up to two points per band may be counted for each different station worked. (Example: W1HDQ works WSBFQ on 50 and 144 Mc. for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only one section multiplier.)

(b) Cross-band work shall not count.

(c) Portable or mobile station operation under one call, from one location only, is permitted.

7) *Awards:* Entries will be classified as single- or multi-operator, a single-operator station being defined as one manned by an amateur who neither receives nor gives assistance to any person during the contest period. Certificates will be awarded in each ARRL section to the top-scoring amateur in the single-operator classification. In addition, a certificate will be awarded to the top Novice or Technician in each ARRL section where at least three such licensees submit valid contest logs. Multioperator work will be grouped separately in the official report of results in *QST*.

When three or more individual club members compete and submit logs naming the club with which they are identified, an ARRL certificate will be issued to the leading club member. When less than three individual logs are received there will be no club award or club mention.

A gravel with an engraved sterling-silver band will be offered the club whose secretary submits the greatest aggregate score, provided such scores are confirmed by receipt at ARRL of the individual contest logs from such members (resident club members only). Claims from federations, radio club councils, or other combinations of radio clubs, will not be accepted. Special memberships granted for contest purposes will not be recognized.

8) *Conditions of Entry:* Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

9) *Reporting:* Reports must be postmarked no later than January 24, 1955, to be considered for awards.

## NEW BOOKS

**RCA Receiving Tube Manual, RC-17.** Published by Radio Corporation of America, Harrison, N. J. 300 pages, 8 $\frac{3}{8}$  by 5 $\frac{3}{8}$  inches, paper cover. Price, 60 cents.

Those who have owned preceding editions of the "Receiving Tube Manual" will hardly need more than the word that a new edition is out, since it is an old stand-by. In addition to containing more detailed data on receiving tubes and kinescopes than can be obtained from the conventional tube tables, the new edition continues (with additions) the sections on tube operation, installation and rating information, amplifier and oscillator design, and the resistance-coupled amplifier tables. Some new hi-fi circuits have also been added to the circuit section. Altogether a most useful member of the amateur's library.

**The Oscilloscope at Work,** by A. Haas and R. W. Hallows. Published for *Wireless World* by Liffé & Sons, Ltd., Dorset House, Stamford Street, London, S.E.1. 171 pages, including index, 5 $\frac{3}{4}$  by 8 $\frac{3}{4}$ , cloth cover. Price, 15s. 0d.

How the oscilloscope functions, and how to use it in making measurements. Over 200 patterns photographed from the c.r. tube screen, with interpretations. Also contains a chapter on shooting trouble in the 'scope itself, and one on auxiliary devices such as probes and the electronic switch.

**Radio Troubleshooting Guidebook, Vol. 1,** by John F. Rider and J. Richard Johnson. Published by John F. Rider Publisher, Inc. 156 pages, including index. 5 $\frac{3}{8}$  by 8 $\frac{1}{4}$ , paper cover. Illustrations. Price, \$2.40.

A general treatment of the subject, divided into three parts. Part I covers the operating principles of superheterodyne receivers for both a.m. and f.m.. Part II the fundamentals of trouble-shooting, and Part III the most common symptoms and remedies.

**The Oscilloscope,** by George Zwick, published by Gernsback Publications, Inc., 25 West Broadway, New York 7, N. Y. 192 pages, including index, 5 $\frac{1}{2}$  by 8 $\frac{1}{2}$ , paper cover. Price, \$2.25.

For the service technician, principles of 'scope tubes, oscilloscope circuits, and accessories. Covers use of the oscilloscope in servicing TV receivers.



CONDUCTED BY EDWARD P. TILTON, W1HDQ

WE'RE indebted to W6BCX for bringing the idea back into focus. During a visit with him and W6VR, Woody dug into his *QST* file and came up with the July, 1928, issue. Did I remember the "Warner Splatter System" offered to a waiting world by the late K. B. Warner on the editorial page of that issue of more than 25 years ago? The idea was to spray large amounts of r.f. at the ionosphere; if you throw enough stuff up there some of it is bound to come back down again — "just as a firehose, with its nozzle directed at the ceiling would provide a sure-fire way of wetting every square inch of the floor in jig time."

KBW was always coming up with something like that; concepts that had everyone laughing at the time, but somehow had a way of proving out years later. He was talking of 10-meter DX then, but he'd be vastly amused to find what is essentially his splatter system in use today, providing consistent communication in the v.h.f. range over distances of 1000 miles or more. And making v.h.f. work possible from locations where no ham in his right mind would have tried 50 Mc. or higher bands even a few years ago.

It is just such "scattering from irregularities in the ionosphere, when other forms of ionospheric transmission are absent"<sup>1</sup> that is now assumed to be responsible for the success of the well-known Cedar Rapids to Washington experiment on 49.8 Mc. and higher frequencies. And a very similar kind of scattering, ionospheric and tropospheric, is being used by some of our best 2-meter stations in working consistently over distances up to 500 miles or so.

The beauty of all this is that, since an elevated scattering medium is involved, the location of the v.h.f. station is relatively unimportant. If the normal radiation pattern of your array clears obstructions in the immediate vicinity of your antenna, you may do just as well in this kind of v.h.f. DX as the fellow on the top of a hill. A high hill is still nice to have, but it is by no means necessary for successful v.h.f. work.

But suppose you're a valley dweller; you look out from your shack window to snow-capped mountain peaks in every direction. What chance is there for a v.h.f. man in such a spot? Well, don't give up until you've given it a good try; you may find that you have a really good location. No, don't send for the men in the white coats; it can be that way. Your snug valley may turn out to be better than a spot out on the open plains!

We've mentioned "knife-edge refraction" in

these pages before, but our recent swing through much of our really high mountain country showed that few v.h.f. men (present or potential) in these areas have given much thought to the application of the theory to their particular set of circumstances. Yet it has been demonstrated that a sharp ridge at just the right point between two low-lying v.h.f. stations can provide enough refraction to bring the signal level up *more than 70 db.* above the value that would be obtained over the same distance in open terrain!

Few hams are likely to be fortunate enough to achieve any such "obstacle gain" but again and again in our mobile work in the western mountains we saw knife-edge refraction at work. In several instances we had strong signals over mountainous paths of greater length than we've ever worked over rolling New England or the flat Middle West. And of course the 2-meter work between Arizona stations and others at distances of 350 miles or more, recently reported in these pages, is further proof that high mountains are, at least, no certain barrier.

Add to these factors the still newer possibility of v.h.f. DX by reflection from meteor trails, now being exploited by W4HHK, W2UK and others, and the tropospheric and auroral phenomena we've known about for years, and you have rather convincing evidence that v.h.f. *can* be fun just about anywhere. Are you getting in on it?

Don't jump to the conclusion, from what we've been saying, that all you need is a 522 and a folded dipole to work 400 miles over the mountains on 144 Mc. It's not that simple, by any means, or we'd have been doing it long ago. The signals you get over long indirect paths are likely to be very weak at best; you'll need plenty of power, a good big antenna, and the best available receiver to turn the trick. Highly selective receivers and c.w. techniques are a must, at least at first. If you've tried a tough path and failed, with anything less than a combination of all these assets, you can't say that it can't be done. Working long hauls over high mountains is a job to separate the men from the boys. Give it all you've got, and the chances are you'll be pleased with the results!

#### OES Notes

W2RHQ, Syracuse, N. Y. — Now on 432 Mc. with 2C39 grounded-grid amplifier, driven by an 832A tripler. Would like to hear from anyone with dope on gear for 1215 Mc. Recently got 32-element 144-Mc. array working properly by bringing two 16-element sections closer together. With the original arrangement (sections a half wave apart between element ends) there was a split forward lobe. Now hearing W2UK, W3BGT and other distant stations off the backs of

<sup>1</sup>N.B.S. Technical Report No. 1682, August, 1952.

their beams fairly regularly; wish stations in New Jersey and Pennsylvania would aim toward central New York State more often.

**W2UTH, Victor, N. Y.** — Back in business in new location after extensive damage to house and antennas by Hurricane Hazel. Activity on 220 Mc. developing in Rochester area with W2s POM RTB MHU UXP and K2CEH on.

**W3UQJ, York, Pa.** — Would like to hear as to results from anyone who has tried 220-Mc. mobile. Suggest more use of c.w. on 220, as contacts have been made. As result of many skeds with W3LZD, W3SJB, W3UJG and W4UMF, it has been found that anytime a readable signal is heard on 144, 220 is just about equally good.

**W4FLW, Dresden, Tenn.** — Gradually developing more activity on 50 and 144 Mc. Working W4CYR, Nashville, and W4HFO, Martin, on 6 and W4BQG, McKenzie, on 2.

**W4HHK, Collierville, Tenn.** — Daily skeds continue with W2UK and W1HDQ. Burst count on W2UK runs as high as 79 for his 10-minute tape transmission at 0640 CST. W1HDQ heard fairly regularly, but with lower burst count, on 5-minute transmission at 0635 CST. Similar meteor-scatter skeds with W5VWU, Albuquerque, N. Mex., 960 miles, have produced only unidentifiable pings, though W5VWU copied complete call sequence on one occasion. Tests also being made with W7VMP, Phoenix, Ariz., 1300 miles, but no identifiable sigs either way as yet.

Revamped crystal-controlled converter recently, putting in overtone crystal on 45.667 Mc. Enough frequency variation is possible in tuning the oscillator plate circuit so that it can be set exactly on frequency, multiplying to 137 Mc. Now the communications receiver dial reads exactly 7000 kc. for 144 Mc., a real aid in keeping weak-signal skeds.

**W5GLX, Baton Rouge, La.** — New Orleans and Jackson, Miss., always reliable on 144 Mc. W4UUF, Pensacola, Fla., W4TLV, Demopolis, and W4OZK, Gadsden, Ala., also heard frequently.

**W6ORS, Alhambra, Calif.** — Working on 220-Mc. crystal-controlled converter. Rig for 220 Mc. (Feb., '54, QST) working nicely.

**W6ZDO, Canoga Park, Calif.** — Daily operation on 220.9 and 221.1 Mc.; conditions much like 112 and 56 Mc. of many years ago, even to superregen receiver QRM! Converted 1350-Mc. radioonde to 1215-Mc. band.

**W7JHX, Port Orchard, Wash.** — Made first TV transmission Oct. 18th. Put rig on following evening and left it running while away from home. Main power transformer shorted, causing much smoke and excitement. Everything repaired within a few days, and can now transmit video on 44.36 Mc. any evening and Sundays by appointment. Can usually be reached on 2 meters, or through Puget Sound Net.

**W9KLR, Rensselaer, Ind.** — Here's a fellow who must hold some kind of record: W9JNZ, on the air three times since he was licensed, made 20 contacts in 15 states and 6 call areas on 144 Mc.!

**VE7FJ, New Westminster, B. C.** — Much talk, by W7s, of going horizontal on 144 Mc. VE7s, always in favor of horizontal, will welcome change.

**V06U and W7SNR/V06, Goose Bay, Labrador** — Local activity on 50, 144 and 220 Mc. These fellows should have a fine opportunity to make v.h.f. history, if they watch conditions closely for chances to work down the Atlantic Seaboard and elsewhere.

## 2-METER STANDINGS

Call			Call				
States	Areas	Miles	States	Areas	Miles		
W1RPU	19	7	1150	W6WSQ	3	3	1390
W1HDQ	19	6	1020	W6BAZ	3	2	320
W1CCH	17	5	670	W6NLZ	3	2	360
W1IZY	16	6	750	W6MMU	2	2	240
W1EIO	16	5	475	W6GCG	2	2	210
W1AZK	14	5	650	W6QAC	2	2	200
W1MNF	14	5	600	W6EXH	2	2	193
W1BCN	14	5	650				
W1KCS	14	5	540	W7VMP	4	3	417
W1DKR	13	5	520	W7JU	3	2	247
W1MMN	10	5	520	W7LEE	3	2	240
				W7JZO	3	2	240
W2ORI	23	8	1000	W7JUO	2	2	140
W2UK	23	7	1075	W7RAP	2	1	165
W2NLY	23	7	1050				
W2AZL	21	7	1050	W8BFQ	29	8	850
W2QED	21	7	1020	W8WXY	28	8	1200
W2BLV	19	7	910	W8WJC	25	8	775
W2OPQ	19	6	—	W8RMH	22	8	690
W2DWJ	17	5	632	W8WRN	20	8	670
W2AOC	17	5	600	W8DS	20	7	675
W2UTH	16	7	880	W8RAX	20	7	655
W2PAU	16	6	740	W8EP	18	7	800
W2PCQ	16	5	650	W8UKS	18	7	720
W2LHL	16	5	550	W8RWV	17	7	630
W2CFT	15	5	525	W8WSE	16	7	830
W2DFV	15	5	520	W8SRW	16	7	700
W2AMJ	15	5	550				
W2QNZ	14	5	400	W9EHX	23	7	725
W2BRV	14	5	590	W9FVJ	22	8	850
				W9EQC	22	8	820
W3RUE	23	8	950	W9KLR	21	7	690
W3NKM	19	7	660	W9RPV	20	7	1000
W3BNC	18	7	750	W9UCH	20	7	750
W3FPH	18	7	—	W9KPS	19	7	660
W3KWL	16	7	720	W9REM	19	6	—
W3LNA	16	7	720	W9LFL	19	—	—
W3BHL	16	5	570	W9ALU	18	7	800
W3GKP	15	6	800	W9MUD	18	6	640
W3TDF	13	5	570	W9JGA	17	6	720
				W9WOK	17	6	600
W4HHK	26	8	1020	W9ZHL	17	6	—
W4AO	22	7	950	W9MBI	16	7	660
W4PCT	20	8	—	W9BOV	15	6	—
W4FY	18	7	830	W9LEE	15	6	780
W4MKJ	16	7	665	W9JNZ	15	6	560
W4UMF	15	6	600	W9DDG	14	6	700
W4OXC	14	7	500	W9FAN	14	7	680
W4JHC	14	5	720	W9QKM	14	6	620
W4WCB	14	5	740	W9DSP	14	5	700
W4TCR	14	5	720	W9UIA	12	7	540
W4IBY	14	5	435	W9ZAD	11	5	700
W4IKZ	13	5	720	W9GTA	11	5	540
W4JFU	13	5	720	W9JBF	10	5	760
W4ZBU	10	5	800				
W4UDQ	10	5	850	W0EMS	25	8	1175
W4TLA	7	4	850	W0IHD	24	7	870
				W0GUD	22	7	1065
W5RCL	21	7	925	W0ONQ	17	6	1090
W5JTI	19	7	1000	W0INT	14	6	830
W5QNL	10	5	1400	W0OAC	14	5	725
W5CVW	10	5	1180	W0ZJB	12	7	1097
W5AJG	10	4	1260	W0WZG	11	5	760
W5JMW	9	4	570				
W5ML	9	3	700	VE3AIB	20	8	890
W5ABN	9	3	780	VE3DIR	18	7	790
W5ERD	8	3	570	VE3BQN	14	7	790
W5VX	7	4	—	VE3DER	13	7	800
W5VY	7	3	1200	VE3PB	12	6	715
W5FEK	7	2	550	VE3AQ	11	7	800
W5ONS	7	2	950	VE1QY	11	4	900
				VE2AOK	10	5	550
W6ZL	3	3	1400	VE7FJ	2	1	365

## C.W. Reception with the Communicator

Use of c.w. on 144 Mc. is increasing all the time, and probably would have progressed further if there were some (Continued on page 134)



With this 24-element array, W7LHL/7, Bolan Peak, in southern Oregon, worked the Northwest's best 2-meter DX in the September V.H.F. Party.

# September V.H.F. Party Results

## *Increased Western Activity Nets Record Number of Logs*

WE MAY never be able to set up any wholly fair system for scoring v.h.f. contests, or any other operating activity, on a national scale, but the disparity between various sections of the country is dropping with every v.h.f. party. Of course, a "national high" is only a mythical honor, anyway, as there is competition only within your own ARRL section, but it is interesting to look through the tabulation at the end of this report and see where the really high scores were made.

Of the geographically small and densely populated ARRL sections along the Eastern Seaboard, only Northern and Southern New Jersey, Western Massachusetts, New Hampshire and Connecticut reported September V.H.F. Party totals higher than the 2095 points piled up in the East Bay Section by K6GWE, Berkeley, Calif. Five eastern sections, supposedly cinches for high spots in a national ranking, were topped by Illinois, Ohio, Michigan, Santa Clara Valley, East Bay and Los Angeles.

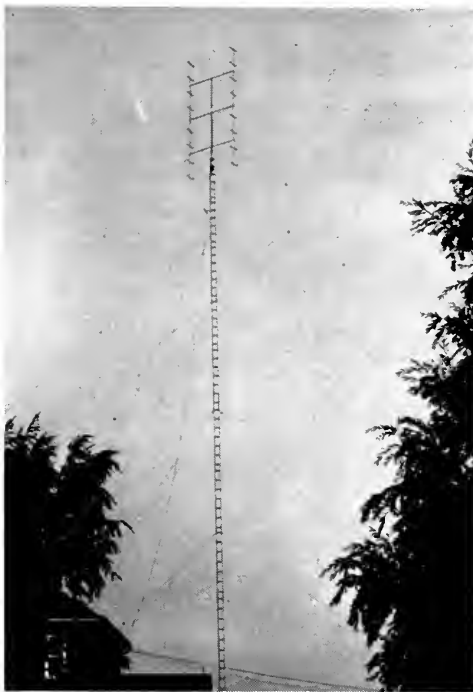
Ignoring the section multiplier, an unfair factor in national comparisons, we find that the number of contacts made is becoming more uniform, the country over, with every contest. In only two ARRL sections, Northern New Jersey and Los Angeles, were more than 200 contacts reported. In the bracket between 150 and 200, we find Illinois, Ohio, Western Massachusetts and New Hampshire. Of the sections reporting 100 to 150 contacts, Indiana, Michigan, Santa Clara Valley and East Bay are outside the "favored" Atlantic Seaboard states. The country's highest one-band score was made, not by an East Coast station, but by W8WXV, Shiloh, Ohio, who worked 196 stations in 17 sections, 3332 points, on 144 Mc. alone.

The ability to work several bands is the most important factor in high scoring, in any section. The rules were set up with that in mind: to promote versatility and encourage the use of our higher bands. Working all bands from 50 to 1215 Mc. enabled K2CMB, Paterson, N. J., to make 280 contacts for 8456 points, the country's high for a single-operator set-up. The 230 contacts of W6WSQ, Pasadena, Calif., made on 50, 144 and 420 Mc., is second in number of QSOs. Lee Waite, W2FBZ, a frequent Northern New Jersey winner, worked 4 bands for 206 contacts and 7488 points, running K2CMB a close second for single-operator high.

Mountain expeditions, as always in spring and fall parties, contributed greatly to the success of the contest. For once, the W1MHL/1 team came off second best. A combination new to v.h.f. contests but with long Field Day experience, W2GSA/2, Garden State Amateur Radio Association, nosed out the Waltham

group, with 327 contacts on 50, 144 and 220 Mc., for 9715 points. Some nice 2-meter DX was worked in the Northwest by mountain portables. W7PVZ/7 in a fire lookout on Capitol Peak, near Olympia, Wash., worked W7LHL/7 on Bolan Peak in Southern Oregon, about 350 miles. An indication of the growth of 2-meter interest in that region: W7PVZ/7 worked 83 different stations on 144 Mc.

The 1215-Mc. band loomed as a v.h.f. contest factor of some proportions. As the result



Sixty-four element beam atop a 100-foot tower — W8WXV, Shiloh, Ohio, country's top one-band scorer. Al worked 196 stations on 144 Mc.

of cooperative effort by K2CMI, K2DFS and W3UQB, five nearly identical 1215-Mc. stations were built. These used 2C39 cavity oscillators, delivering about 12 watts output. Tuned-cavity crystal mixers with 144-Mc. output worked into Gonset Communicators as tunable i.f.'s. Duplicate corner-reflector arrays were used for transmission and reception. The rigs were used by W1JRV/1 at Mead Pond, just over the line in Connecticut, W3UQB/2 at Balanced Rock, Nyack, N. Y., K2DFS, at his home in Bergenfield, N. J., and K2CMI/2 and W2FSN/2 in Manhattan high spots, to give K2CMB five contacts in four ARRL sections on 1215 Mc.

Around San Francisco there was enough doing

on 144 Mc. so that W6TDP made 56 contacts with 5 watts input to a 5763 doubler (rig built from W2HHW's description in February, 1954, *QST*), and a cut-down TV Yagi hung in his basement!

Two 0-0-0 scores don't appear in the tabulation, but they represent effort and good intentions. One goes to W7RCC, Panguitch, Utah, who was in there trying, but heard no signals. The other was earned by W1HDQ/0. Your conductor got up before 0600 Sunday morning and drove out from the Dakota Division Convention Headquarters in Rapid City, S. D., to a fine clear spot in the Black Hills. Having been in every v.h.f. contest since the first one in 1939, he was going to give this one the "college try," but he didn't reckon with the effects of the bright South Dakota sun. With the car parked, windows closed, all the previous day, the crystal mike just couldn't take it. Having no provision for keying the rig or copying c.w., on the mobile receiver, W1HDQ/0 folded his beam and silently stole back to Rapid City.

In the following tabulation, scores are listed by ARRL Divisions and Sections. Unless otherwise noted, the top scorer in each section receives a certificate award. Columns indicate the final score, the number of contacts, the section multiplier, and the bands used. A represents 50 Mc.; B, 144 Mc.; C, 220 Mc.; D, 420 Mc.; and E, 1215 Mc. Multiple-operator stations, with calls of participating operators, are shown at the end of each section tabulation.

## ATLANTIC DIVISION

### E. Pennsylvania

W3TDF...2016-112-18-AB  
W3TYX...1024-128-8-B  
W3MRQ/3...714-48-14-BCD  
W3YWF...644-89-7-BC  
W3SAO...596-85-7-B  
W3OLV/3...510-60-9-B  
W3WED...112-28-4-B  
W3THR...48-16-3-B  
W3LCM...16-8-2-B  
W3KX/3<sup>6</sup> (W3s DNT LZD  
YPG NXH QGX PMG)  
4288-117-32-ABCD

W3LCK/3 (W3s LCK NEP)  
228-32-6-BCD

### Maryland-Delaware-D. C.

W3TOM...988-76-13-AB  
W3CGV...832-63-13-ABC  
W3YHI...792-8-9-B  
W3LMC...729-81-9-B  
W3UJG...618-51-12-ABC  
W3LZZ...220-44-5-B  
W3OJU...189-27-7-A  
W3OTC...116-21-6-A  
W3NZR...115-23-5-B  
W3KMY...114-19-6-A  
W3PGA...110-22-5-B  
W3NH...104-26-4-B  
W3ONP...104-26-4-B  
W3N3LQ...93-3-4-B  
W3BYG...88-22-4-B  
W3ZMK...75-25-3-B  
W4WPL/3...36-18-2-B

### S. New Jersey

W2QED...3425-127-25-ABCD  
W3TOM...2006-118-17-B  
W2BLV...561-47-11-BD  
W2ORA...248-31-8-AB  
W2BAY...16-4-4-A

### Western New York

W2ALR...1177-107-11-AB  
W2RU1...1144-79-13-ABCD

K2ETH...750-75-10-AB  
W2UTH...700-70-10-AB  
W2ORI...432-72-6-B  
W2WFB...400-56-8-B  
W2RIQ...384-63-6-AC  
KN2HAO...284-71-4-AB  
W2FC/2...204-54-6-B  
W2KZ...200-50-4-B  
W2QNA...152-38-4-B  
W2RXG...125-25-5-B  
K2CVN...52-13-4-B

W2CTA...46-23-2-B  
W2QY...42-21-2-B  
W2EFO...38-19-2-B  
W2BLN/2...24-8-3-B  
KN2INO...23-23-1-B  
W2BLP...10-10-1-B  
W2RJL...10-5-2-A  
W2THJ...7-7-1-B  
W2GJ<sup>6</sup> (W2s JGJ UPT)  
1660-83-20-AB  
W2OFQ/2 (W2s OXS MSM  
HAX K2s HWS AQP)  
715-54-13-BD

### W. Pennsylvania

W3FPH...517-47-11-AB  
W3KWL...342-57-6-AB  
W3KXI...275-55-5-B  
W3QCN...10-5-2-B  
W3KX/3 (W3s UTM SVJ  
ZDW MPK WHY)  
585-65-9-AB

## CENTRAL DIVISION

### Illinois

W9WOK...2325-155-15-AB  
W9EQC...1120-112-10-AB  
W9DRN...1070-103-10-BC  
W9QRM...890-89-10-AB  
W9MT...525-75-7-B  
W9HJY/3...431-62-7-B  
W9NVW...402-67-6-B  
W9ALR...390-65-6-B  
W9USI...345-69-5-B  
W9NEGB...312-62-6-B  
W9ALD...216-36-6-B  
W9BO1...200-40-5-B  
W9KC/W...170-34-5-B  
W9KLD...160-32-5-B  
W9IFA...150-25-6-B  
W9RCM...120-24-5-B  
W9RIV...100-20-5-B  
W9ZLN...80-20-4-B  
W9MYC...46-23-2-B  
W9CX...45-15-3-B  
W9PMN...30-10-3-B  
W9OTV...9-9-1-B

### Indiana

W9KLR...1441-131-11-B  
W9ZHL...732-61-12-AB  
W9NIMO...112-16-7-B  
W9THW...90-48-5-B  
W9VAY...88-22-4-B  
W9NIOC...50-10-5-B

### Wisconsin

W9RNX...408-68-6-B  
W9ZAD...378-54-7-AB

Antennas and part of 360-degree view at the location of K6GWE, Vollmer Peak, Berkeley, Calif., East Bay Section leader.

W9TQ...210-35-6-AB  
W9BTI...150-25-6-AB  
W9UJM...144-36-4-B  
W9GJL...100-25-4-B  
W9DSP...50-16-5-B  
W9ZJA...56-14-4-B

## DAKOTA DIVISION

### Minnesota

W9TJF...60-12-5-B  
W9OAC...48-12-4-B  
W9MVP...4-2-1-C  
W9OFY...4-2-1-C  
W9OFZ...4-2-1-C

## DELTA DIVISION

### Tennessee

W4HHK...320-32-10-B  
W4GIS...69-23-3-B

## GREAT LAKES DIVISION

### Kentucky

W4PCT...935-85-11-AB

### Michigan

W8RML...2040-115-17-ABCD  
W8DX...1320-80-15-ABCD  
W8NOH...288-48-6-B  
W8NSH...240-48-5-B  
W8SPN/2...205-41-5-B  
W8GYU...200-40-5-B  
W8DDO...180-36-5-AB  
W8PSN...164-41-4-B  
W8BGY...152-38-4-B  
W8GTK...148-37-4-B  
W8JXU...90-30-3-B  
W8FGH...63-21-3-B  
W8NPC...57-19-3-B  
W8ITV...52-26-2-B  
W8NQOC (W8s PJS QOO  
SXZ)...144-36-4-B

### Ohio

W8WNV...3332-196-17-B  
W8LPL...2100-135-15-ABC  
W8NRM...1722-112-14-ABCD  
W8SDJ...680-85-8-B  
W8HOH...600-73-8-BC  
W8LAI...512-64-8-B

W8JSW...486-81-6-B  
W8IFK...432-72-6-AB  
W8LOF...360-60-6-B  
W8HMO...340-63-5-BC  
W8SPER/2...325-65-5-B  
W8BAX...290-56-5-BC  
W8WRN...273-37-7-ABC  
W8QLB...238-34-7-AB  
W8JL...235-47-5-B  
W8SSRO...235-47-5-B  
W8FAZ...215-40-5-BC  
W8OIN...215-43-5-B  
W8PMJ...185-37-5-B  
W8KOM...114-57-2-B  
W8LCY...112-28-4-B  
W8NQEP...92-46-2-B  
W8NQIU...74-37-2-B  
W8NAF...72-36-2-B  
W8HSY...70-35-2-B  
W8SSVU...62-31-2-B  
W8NPKS/8...56-28-2-B  
W8IEZ...44-22-2-B  
W8WAB...34-17-2-B  
W8INQ...12-6-1-C  
W8OIM...7-7-1-B

## HUDSON DIVISION

### Eastern New York

W2RMA...1134-63-18-AB  
W2MXJ...670-67-10-B  
W2ACY...624-52-12-B  
K2DRV...410-41-10-B  
W2MHE...341-31-11-B  
W2RTE...112-16-7-B  
W2YIK...100-20-5-AB  
W2RML/2 (W2s RML ESE  
K2GCH KN21PK)  
560-70-8-B

### N. Y. C.-L. I.

W2KIT...2044-146-14-B  
W2BRV...1260-120-10-B  
K2IEJ/2...948-79-12-B  
W2JBQ...936-78-12-B  
W2DZR...882-98-9-B  
W2KIR...882-98-9-B  
W2AOD...856-100-8-BD  
W2YQ...804-134-6-B  
W2DLO...748-68-11-AB  
W2GLH...546-78-7-B  
K2DIL...480-40-12-B  
W2LID...470-94-5-B  
W2PTN...355-91-5-B  
W2IAX/2...370-74-5-B  
W2AWII...312-52-6-AB  
K2ESZ...252-63-4-B  
W2EEN...240-60-4-B  
W2YIP...188-47-4-B  
W2LKP...186-25-6-BD



KN2HOR? 184- 46- 4-B  
K2CMV...164- 41- 4-B  
W2IN...144- 45- 3-B  
W2TUK...144- 36- 4-B  
K2CWS...144- 36- 4-B  
W2WOF...110- 17- 5-BD  
KN2HAM/2

42- 21- 2-B  
KN2IPH...15- 15- 1-B  
W2JZT/2 (W2s HJM JZT)  
270- 45- 6-B

#### N. New Jersey

K2CMB...8456-280-28-  
ABCE  
W2FBZ...7488-206-32-  
ABCD  
W2RGV...5150-194-25-ABC  
W2DZA...1683- 81-17-  
ABCD  
W2LHL...732- 61-12-B  
W2NMM...540- 60- 9-B  
K2BJP...532- 76- 7-B  
KN2HEY/2  
460-115- 4-B  
W2PEV...408- 51- 8-AB  
K2EQD...200- 40- 5-B  
W2ESC/M 123- 41- 3-B  
W2OAE...92- 15- 5-B  
W2CJA...85- 17- 5-B  
PAT PWS GUM NBE HWX  
AF K2s EGO HNA  
9715-327-29-ABC

#### MIDWEST DIVISION

##### Iowa

WN0USQ...66- 22- 3-B

##### Kansas

W0HJ...182- 26- 7-B  
W0BDK...95- 19- 5-B  
W0IAJ...85- 17- 5-B  
W0JAS...60- 15- 4-B  
W0MOX/0...27- 9- 3-B

##### Missouri

W0ETJ...648-54-12-B  
W0IHD...192- 32- 6-B

##### Nebraska

W0HNI...156- 26- 6-B  
W0VEC...150- 25- 6-B  
W0LEF...105- 21- 5-B

#### NEW ENGLAND DIVISION

##### Connecticut

W2BVU/1  
4263-137-29-  
ABCD  
W1KHL...2646-126-21-AB  
W1HDC/4

2332-105-22-ABD  
W1PHR...1683- 97-17-ABD  
W1REZ...1260- 90-14-B  
W1TXL...900- 90-10-B  
W1URC...510- 51-10-B  
W1QAK...459- 51- 9-B  
W1ZDP...420- 60- 7-B  
W1RMU...346- 6- 6-B  
W1NOB...270- 45- 6-B  
W1AW<sup>4,5</sup> 228- 38- 6-AB  
W1N1CDD<sup>2</sup> 228- 57- 4-B  
W1ULY...210- 42- 5-B  
W1STU...158- 47- 4-B  
W1NAMY...121- 3- 3-B  
W1YDS...111- 37- 3-B  
W1AKN...98- 49- 2-B  
W1KHM...84- 21- 4-AB  
W1NEQ...75- 25- 3-B  
W1N1CDD<sup>2</sup> 60- 30- 2-B  
W1QLL/1...36- 28- 2-B  
W1EEW...36- 18- 2-B  
W1WHF...4- 4- 1-B

##### Maine

W1TAM...374-34-11-AB  
W1LKP...24- 4- 4-  
ABCD

##### E. Massachusetts

W1OOP...1921-102-17-  
ABCD  
W1AQE...1200-100-12-AB  
W1JH...1188-108-11-B  
W1CTW...918- 92- 9-ABC  
W1LYL...345- 69- 5-B  
W1DJ...240- 30- 8-A  
W1BRK...108- 27- 4-B  
W1NZOC...75- 25- 3-B  
W1BYL...60- 62- 2-B  
W1MEG...66- 14- 4-B  
W1CTR...36- 12- 3-B  
W1MGP/M 33- 11- 3-A  
W1TUM...28- 7- 2-C  
W1AEQ...22- 11- 2-B  
W1QCC/<sup>16</sup> (W1s QCC VZQ)  
3500-120-28-  
ABCD

W1KBN (W1s KBN VKT)  
80- 20- 4-B  
W1YIZ (W1s LJM YIZ)  
48- 16- 3-B

#### W. Massachusetts

W1RFU...5348-191-28-AB  
W1VNH...2875-113-25-ABD  
W1JWV...150- 30- 5-B  
K2GIR/1...128- 16- 8-A  
W1HND/1 (W1s HXD RGM  
U1Y WRG)  
742- 53-14-AB

#### New Hampshire

W1FZ/1...4752-166-27-  
ABCD  
W1U1Z/1 2976-119-24-ABC  
W1WML...78- 13- 6-AB  
W1MHL/<sup>16</sup> (W1s LUW PYM  
QMN R1D)  
9316-257-34-  
ABCD

W1LUW/M (W1s LUW  
QMN)...10- 5- 2-B

#### Rhode Island

W1ZQJ...2002-143-14-B  
W1UEF/1 (W1s KLF UEF  
WUJ)...355- 71- 5-B  
Vermont  
W1MMN...96- 16- 6-B  
W1YDM/1 (W1s VLY YDM)  
1691- 89-19-AB

#### NORTHWESTERN DIVISION

##### Oregon

\*W7OKV/7 180- 60- 3-B  
W7XGW...112- 28- 4-AB  
W7INX...81- 27- 3-AB  
W7HHH...69- 23- 3-AB  
W7NKR...42- 21- 2-B  
W7JIP/7 (W7s JIP OAY  
SAO)...284- 71- 4-AB

##### Washington

W7CFE...315- 63- 5-AB  
W7PNZ/7 249- 83- 3-B  
W7JHZ/7 200- 50- 4-AB  
W7N7ZB 153- 51- 3-B  
W7SRL7 126- 43- 3-B  
W7RTI...106- 53- 2-AB  
W7MIU...87- 26- 3-AB  
W7PRV...72- 36- 2-B  
W7KQ...68- 34- 2-AB  
W7ALU...56- 28- 2-B  
W7N7WRL 40- 20- 2-B  
W7P08...36- 18- 2-AB  
W7BML...30- 15- 2-B  
W7BYK...30- 15- 2-AB  
W7BR/7 (W7s QKE IEE)  
335- 67- 5-AB

#### PACIFIC DIVISION

##### Nevada

W7JU...8- 4- 2-B

##### Santa Clara Valley

W6YEO...1708-114-14-ABD  
W6EJC...1242-100-12-ABD  
W6SAW...612-102- 6-B  
W6EXN...540- 90- 6-B  
KN6CQG 208- 52- 4-B  
KN6DTS 150- 30- 5-B  
W6BD0/6 (W6s BDO YGX  
SSA ODK K6VZ)  
1365- 98-13-ABD

##### East Bay

W6UPD...205- 41- 5-B  
W6WPE/M 57- 19- 3-B  
K6GWE (W6s DNX MXQ  
RLB UOV VSW)  
2096-121-16-  
ABCD  
W6WJX (W6s JX MGO)  
111-101-11-AB  
KN6EDX/6 (W6GZLE K6ERG  
KN6EDN) 636-106- 6-B  
K6AZH/6 (W6s RKT EXL  
VDR JLG) 540- 90- 6-AB

##### San Francisco

W6AJF...1425- 56-15-  
ABCD  
W6BAZ...610- 61-10-AB  
W6TDP...280- 56- 5-B  
KN6HIK 252- 63- 4-B  
KN6HIT/6 189- 63- 3-B  
K6GVB...108- 27- 4-B

##### Sacramento Valley

W6PIV...304- 38- 8-AB  
W6OTN...216- 36- 6-B  
W6VBU...88- 22- 4-AB  
W6KUI/<sup>68</sup> (W6FNX K6BIQ)  
331- 59- 9-AB  
K6BAT (K6s ANX BAT)  
152- 18- 8-ABD

#### ROANOKE DIVISION

##### North Carolina

W4MDA...30- 10- 3-B

#### Virginia

W4UBY...1326-102-13-AB  
W4UMF...876- 69-12-ABC  
W4JCJ...783- 87- 9-B  
W4MLR...354- 59- 6-B  
W4VNE...175- 23- 7-BD  
W6LOL/4 155- 31- 5-B  
W3SFY/4 (W3s SFY WBY)  
780- 78-10-AB

#### SOUTHEASTERN DIVISION

##### Alabama

W4TLV...28- 7- 4-B

#### SOUTHWESTERN DIVISION

##### Los Angeles

W6WSQ...1617-230- 7-ABD  
W6MMU...999-109- 9-ABD  
W6IWY...819- 82- 9-  
ABCD

W6OGX...543-151- 3-B  
K6ACF...396-132- 3-B  
K6DNJ...333-111- 3-B  
W6LIT...330- 66- 5-AB  
KN6GMX 330-110- 3-B  
W6MRH...294- 98- 3-B  
W6HZ...280- 54- 5-BC  
W6WRT 222- 71- 3-B  
W6DNL...60- 60- 1-B  
K6CJG...6- 6- 1-B  
W6LEE/6...2- 1-1-B  
W6YZU/6...2- 1-1-B

##### Arizona

W7LEE...95- 19- 5-B  
W7VMP...95- 19- 5-B  
W7YZU...28- 7- 4-B

##### Santa Barbara

W6OHQ/6 364- 50- 7-BD  
K6CRJ...129- 43- 3-B

KN6HEC 54- 18- 3-B

#### WEST GULF DIVISION

##### Northern Texas

W58NX...3- 3- 1-B

##### Oklahoma

W5DFU...21- 7- 3-B

##### New Mexico

W5FAG/5...24- 12- 2-B  
W5FPB...11- 11- 1-B  
W5EYR...7- 7- 1-B  
W9EYV/5...6- 6- 1-B

#### CANADIAN DIVISION

##### Maritime

V06U...12- 4- 1-AC  
W7SNR/V06.9- 6- 1-AC

##### Ontario

VE3BQN/3  
1067- 93-11-  
ABCD

VE3DNX 869- 78-11-BC  
VE3AIB 776- 95- 8-ABD  
VE3DIR 462- 66- 7-B  
VE3AQG 335- 71- 5-B  
VE3BGI 225- 45- 5-AB  
VE3DSU 215- 43- 5-B  
VE3DHG 210- 42- 5-AB  
VE3DER 204- 34- 6-AB  
VE3AET 155- 37- 5-AB  
VE3AGW 168- 42- 4-AB  
VE3MBB 132- 33- 4-B  
VE3BPB...72- 12- 6-B  
VE3KMM...9- 9- 1-A

##### Quebec

VE2AOK...126- 18- 7-B

##### British Columbia

VE7FJ...45- 16- 3-B

<sup>1</sup> W3NZAQ, opr. <sup>2</sup> Novice award winner.

<sup>3</sup> W1VLH, opr. <sup>4</sup> Hq. staff - not eligible for award. <sup>5</sup> W1WPR, opr. <sup>6</sup> Multiple-operator award winner. <sup>7</sup> W7QPM, opr.

## CALLING ALL NOVICES: CQ N-R!

The Novice Round-up makes its fourth annual appearance this year, January 8th through 23rd. Old-timers are invited to join in the fun and give the newcomers contacts.

Full details appeared in December *QST*, but as a reminder, don't forget that the Round-up starts on Saturday, January 8th, at 6:00 p.m., local time, and ends on Sunday, January 23rd, 9:00 p.m. local time. A time limit of forty hours is available. This can be used any way you prefer in operation on 80, 40, 15 and 2 meters.

You've still time to get extra scoring credits by qualifying in the Code Proficiency Run from W1AW on January 14th, or from W6OWP on January 7th. In the meantime, send to ARRL Headquarters for your free map of the United States, a contest log, and reporting forms for the Novice Round-up. The fine outline map can be posted in your shack to keep a visual check on your worked-all-states progress.

Remember to read December *QST* again for full details on rules.

# A.R.R.L. COUNTRIES LIST • Official List for ARRL DX Contest and the Postwar DXCC

AC3.....	Sikkim	KC6.....	Western Caroline Islands	VP5.....	Turks & Caicos Islands
AC4.....	Tibet	KG4.....	Guantanamo Bay	VP6.....	Barbados
AP.....	Pakistan	KG6.....	Mariana Islands	VP7.....	Bahama Islands
BV, (C3).....	Formosa	KH6.....	Hawaiian Islands	VP8.....	(See CETZ, VK1, LU-Z)
C (unofficial).....	China	KJ6.....	Johnston Island	VP8.....	Falkland Islands
C3.....	(See BV)	KL7.....	Alaska	VP8.....	South Georgia
C9.....	Manchuria	KM6.....	Midway Islands	VP8, LU-Z.....	South Orkney Islands
CE.....	Chile	KP4.....	Puerto Rico	VP8.....	South Sandwich Islands
CE7Z, LU, VK1, VP8.....	Antarctica	KP6.....	Palmyra Group, Jarvis Island	VP8, LU-Z.....	South Shetland Islands
CE9.....	Easter Island	KR6.....	Ryukyu Islands (e.g., Okinawa)	VP9.....	Bermuda Islands
CM, CO.....	Cuba	KS4.....	Swan Island	VQ1.....	Zanzibar
CN2, KT1.....	Tangier Zone	KS6.....	American Samoa	VQ2.....	Northern Rhodesia
CN8.....	(See CN2)	KT1.....	(See CN2)	VQ3.....	Tanganyika Territory
CP.....	Bolivia	KV4.....	Virgin Islands	VQ4.....	Kenya
CR4.....	Cape Verde Islands	KW6.....	Wake Island	VQ5.....	Uganda
CR5.....	Portuguese Guinea	KX6.....	Marshall Islands	VQ6.....	British Somaliland
CR5.....	Principe, Sao Thome	KZ5.....	Canal Zone	VQ8.....	Chagos Islands
CR6.....	Angola	LA, LB.....	Jan Mayen	VQ8.....	Mauritius
CR7.....	Mozambique	LA, LB.....	Norway	VQ9.....	Seychelles
CR8.....	Goa (Portuguese India)	LA, LB.....	Svalbard (Spitzbergen)	VR1.....	Gilbert & Ellice Islands
CR9.....	Macao	LU.....	Argentina	VR1.....	& Ocean Island
CR10.....	Portuguese Timor	LU-Z.....	(See CE7Z, VK1, VP8)	VR2.....	British Phoenix Islands
CT1.....	Portugal	LX.....	Luxembourg	VR2.....	Fiji Islands
CT2.....	Azores Islands	LZ.....	Bulgaria	VR3.....	Fanning Island
CT3.....	Madeira Islands	M1.....	San Marino	VR3.....	(Christmas Island)
CX.....	Uruguay	MB9.....	(See OE)	VR4.....	Solomon Islands
DJ, DL, DM.....	Germany	MP4.....	Bahrein Island	VR5.....	Tonga (Friendly) Islands
DU.....	Philippine Islands	MP4.....	Kuwait	VR6.....	Pitcairn Island
EA.....	Spain	MP4.....	Qatar	VS1.....	Singapore
EA6.....	Balearic Islands	MP4.....	Trucial Oman	VS2.....	Malaya
EA8.....	Canary Islands	MS4.....	(See I5)	VS4.....	Sarawak
EA9.....	Idni	OA.....	Peru	VS5.....	Brunei
EA9.....	Rio de Oro	OD5.....	Lebanon	VS6.....	Hong Kong
EA9.....	Spanish Morocco	OE, MB9, FK88.....	Austria	VS9.....	Aden & Socotra
EA9.....	Spanish Guinea	OH.....	Finland	VS9.....	Maldives Islands
EI.....	Republic of Ireland	OK.....	Czechoslovakia	VS9.....	Sultanate of Oman
EL.....	Liberia	ON4.....	Belgium	VU2.....	India
EQ.....	Iran (Persia)	OQ5, 9.....	Belgian Congo	VU4.....	Laccadive Islands
ET2.....	Eritrea	OX.....	Greenland	VU5.....	Andaman and Nicobar Islands
ET3.....	Ethiopia	OY.....	Faeroes	XE.....	Mexico
F.....	France	OZ.....	Denmark	XZ.....	Burma
FA.....	Algeria	PA9.....	Netherlands	YA.....	Afghanistan
FB8.....	Amsterdam & St. Paul Islands	PJ2.....	Netherlands West Indies	YI.....	Iraq
FB8.....	Kerguelen Islands	PK1, 2, 3.....	Java	YJ.....	(See FUS)
FB8.....	Madagascar	PK4.....	Sumatra	YK.....	Syria
FC.....	Corsica	PK5.....	Netherlands Borneo	YN.....	Nicaragua
FD.....	French Togoland	PK6.....	Celebes & Molucca Islands	YO.....	Roumania
FES.....	French Cameroons	PX.....	Andorra	YS.....	Salvador
FF8.....	French West Africa	PY.....	Brazil	YU.....	Yugoslavia
FG.....	Guadeloupe	PZ1.....	Netherlands Guiana	YV.....	Venezuela
FIS.....	French Indo-China	SM.....	Sweden	ZA.....	Albania
FK8.....	New Caledonia	SP.....	Poland	ZB1.....	Malta
FK88.....	(See OE)	ST.....	Anglo-Egyptian Sudan	ZB2.....	Gibraltar
FL8.....	French Somaliland	SU.....	Egypt	ZC2.....	(See VK1)
FM.....	Martinique	SV.....	Greece	ZC3.....	Christmas Island
FN.....	French India	SV.....	Crete	ZC4.....	Cyprus
FOS.....	Clipperton Island	SV.....	Dodecanese (e.g., Rhodes)	ZC5.....	British North Borneo
FOS.....	French Oceania (e.g., Tahiti)	TA.....	Turkey	ZC6.....	Palestine
FP8.....	St. Pierre & Miquelon Islands	TF.....	Iceland	ZC7.....	(See JY)
FQ8.....	French Equatorial Africa	TG.....	Guatemala	ZD1.....	Sierra Leone
FR7.....	Reunion Island	TI.....	Costa Rica	ZD2.....	Nigeria
FUS, YJ.....	New Hebrides	TI9.....	Cocos Island	ZD3.....	Gambia
FY7.....	French Guiana & Inini	UA1, 3, 4, 6.....	European Russian	ZD4.....	Gold Coast, Togoland
G.....	England	UA9, 9.....	Socialist Federated Soviet Republic	ZD6.....	Nyasaland
GC.....	Channel Islands	UA9, 9.....	Asiatic Russian S.F.S.R.	ZD7.....	St. Helena
GD.....	Isle of Man	UB5.....	Ukraine	ZD8.....	Ascension Island
GI.....	Northern Ireland	UC2.....	White Russian Soviet	ZD9.....	Tristan da Cunha & Gough Islands
GM.....	Scotland	UC2.....	Socialist Republic	ZE.....	Southern Rhodesia
GW.....	Wales	UD6.....	Azerbaijan	ZK1.....	Cook Islands
HA.....	Hungary	UF6.....	Georgia	ZK2.....	Niue
HB1, 9.....	Switzerland	UG6.....	Armenia	ZL.....	New Zealand
HC.....	Ecuador	UH8.....	Turkoman	ZM6.....	British Samoa
HC8.....	Galapagos Islands	UI8.....	Uzbek	ZM7.....	Tokelau (Union) Islands
HE.....	Leichtenstein	UJ8.....	Tadzhik	ZP.....	Paraguay
HI.....	Haiti	UL7.....	Kazakh	ZS1, 2, 4, 5, 6.....	Union of South Africa
HI.....	Dominican Republic	UM8.....	Kirghiz	ZS2.....	Marion Island
HK.....	Colombia	UN1.....	Karelo-Finnish Republic	ZS3.....	Southwest Africa
HK9.....	Archipelago of San Andres and Providencia	UO5.....	Moldavia	ZS7.....	Swaziland
HL.....	Korea	UP2.....	Lithuania	ZS8.....	Basutoland
HP.....	Panama	UQ2.....	Latvia	ZS9.....	Bechuanaland
HR.....	Honduras	UR2.....	Estonia	3A.....	Monaco
HS.....	Siam	VE, VO.....	Canada	3V8.....	Tunisia
HV.....	Vatican City	VK.....	Australia (including Tasmania)	4S7.....	Ceylon
HZ.....	Saudi Arabia (Hedjaz & Nejd)	VK1.....	(See CETZ, LU-Z, VP8)	4W1.....	Yemen
I.....	Italy	VK1, ZC2.....	Cocos Island	4X4.....	Israel
I1.....	Trieste	VK1.....	Heard Island	5A.....	Libya
I5, MS4.....	Italian Somaliland	VK1.....	Macquarie Island	9S4.....	Saar
IS1.....	Sardinia	VK9.....	Norfolk Island	.....	Albadra Islands
JA, KA.....	Japan	VK9.....	Papua Territory	.....	Bhutan
JY, ZC7.....	Jordan	VK9.....	Territory of New Guinea	.....	Comoro Islands
JZ9.....	Netherlands New Guinea	VO.....	(See VE)	.....	Fridtjof Nansen Land
K, W.....	United States of America	VP1.....	British Honduras	.....	(Franz Josef Land)
KA.....	(See JA)	VP2.....	Leeward Islands	.....	Mongolia
KA9.....	Bonin & Volcano Islands	VP2.....	Windward Islands	.....	Nepal
KB6.....	Baker, Howland & American Phoenix Islands	VP3.....	British Guiana	.....	Tannu Tuva
KC4.....	Navassa Island	VP4.....	Trinidad & Tobago	.....	Wrangel Islands
KC6.....	Eastern Caroline Islands	VP5.....	Cayman Islands	.....	
		VP5.....	Jamaica	.....	





CONDUCTED BY ROD NEWKIRK,\* W9BRD

## Why:

Well — 1955. A new DX year coming up!

We've instructed Jeeves to go out and pin down the reasons for all the wide smiles of high DX morale prevalent at this writing. Here's what the ear-tufted gentleman uncovered in the line of facts, ma'am, DX blessings that are no sorrow to comprehend:

... The propagational worm has turned and conditions on our higher-frequency DX bands are on a slow but sure mend. About time!

... Fifteen meters, our newest DX band of vast potentialities, is about to come into its own. If any band has a chance to unseat Old Pro Twenty as the DX band, 21 Mc. is it. Indeed, counting 11 meters, it won't be long before we have four DX bands simultaneously capable of producing rare daylight DX.

... There are more ARRL DXCC Countries List items readily workable than ever before, this despite the general absence of U-prefixed stations. Increasing traffic at W1WPO's Hq. DXCC desk reflects this and you'll be able to prove it for yourself next month in the annual ARRL DX Competition. QRV?

... Liberalization of amateur regulations in several overseas countries during 1954 now is evident in the increasing number of formerly rare prefixes heard on DX bands. Austrian, Japanese and Philippine nationals particularly benefited. The sluggish ITU "ban" list which originally included over a dozen countries now is whittled down to French Indo-China, Indonesia, Iran, Korea and Thailand.

... TVI terrors continue to wane. Guys who surrendered to the one-eyed monsters a couple of years ago now are back on the air with modern single-frequency-output rigs, working DX and grousing about another nuisance — ITV.

... Single-sideband DX in 1955 no longer is just around the corner. It's here. Flip your receiver on and you'll hear DXers eagerly putting s.s.b. to work on long-haul A3 paths, a facet of the game attracting converts and exponents daily.

... A relatively new DX-hunting gimmick is creating much interest and finding wide acceptance: the "midget" rotary beam. Thoroughly propounded in 1954 QSTs, these miniature squinters have given cliff dwellers a better chance to slug it out with the antenna-farm lads, and have made 7-Mc. rotaries highly practicable.

That's enough detail to go into in our limited space. And there you are, as George Gobel puts it. You need no rose-tinted specs to diagnose the 1955 DX world sound, substantial, and rarin' to go. And, as usual, your monthly chunk of QST is rarin' to record your 1955 reports and contributions — band by band, QTH by QTH, continent by continent, photo by photo and cliché by cliché. Like this, for instance. . . .

## What:

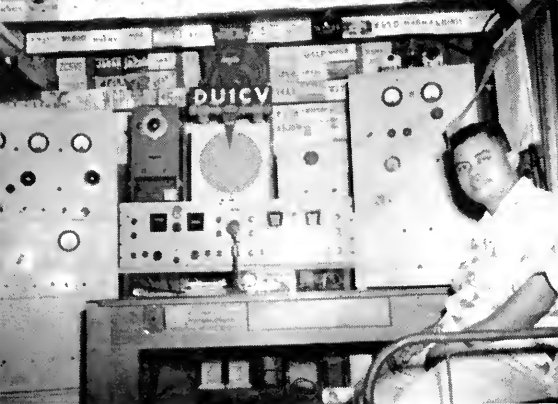
Fifteen, as we were saying, is coming along nicely. W7AHX radiotelephoned with a wide selection of stuff including CX3BH, EL2X, HC2JR, KA8AB, KC6AA,

\* New Mailing Address: Effective immediately, please mail all reports of DX activity to DX Editor Newkirk's new address: 5833 North Kenmore Ave., Chicago 40, Illinois.

KG6GX, KJ6AZ, OQ5RU and ZB2A. . . . CN8MM, ZC4JA, ZS3s BC and E came back to K2CHS on voice. . . . HC3s 1MB 2PG and VK9DB top W5QXX's lengthy A3 list. . . . W6ZZ caught up with voicers DU7SV, HK3FV, JA4BB, KW6s AT BB, VP3YG, a VP8 and unusual XE5PD. . . . Ws 1JLN 1MGP and 4YQB catch their share of the goodies, W1MGP with a mere 3-watt mobile outfit. . . . Newark News Radio Club logged 21-Mc. 'phone candidates CP5EK, CT3AN, EA9s AR AS, ELs 3A 12A, TA3AA, SV0WK, VQs 2DT 4EZ 4RF 5BVF, ZB1s AUV BO, ZEs 2KR 5JJ, ZS3B, 4X4s BC and BL. . . . Fifteen c.w. is equally productive and ZD6BX recommends FY7YC, HZ1HZ, SU1XZ, Y12AM, YVs 1AD 5AE and ZD2DCP. . . . W2ESO stalks code men ZSs 7D and 9I; Ws 1CTW and 8DAW nabbed ZD6BX (73) 14 EST. . . . DU7SV, LU1ZT, PJ2AA, TI2BX, YV5BJ and ZE5JJ swapped c.w. with W7AHX. . . . KP4KD reached 83 15-meter c.w. countries by way of an FY7, OE5JK, TF3MB (80) 17 GMT and a ZD6.

Twenty 'phone reels with goodies and K2CJN made off with CR4AL (125) 16 EST, FF8AP, LX1DU (148) 9, ST2NW 16, VQs 2DT 3RJB, ZD4BR and 3V8BB, VQ5DES, YO3CM, 4S7LM, 4X4DK and a ZD3 escaped. . . . VPs 1GG and 7NS (190) 15 EST worked VE5HR. . . . ET2XX (198), OD5AB and TA3AA will ship QSLs to W7AHX. . . . W5KUC and the 200-DXC boys drew beads on scrumptious FY7YE (185) 0, LH2P (145) 6-8 of Svalbard, VQ8CB, VS4HK (100-200) who moves to VS5, YK1AE (148) 14, ZC3AC, 4S7s FG (110) 18, YL (105) 18 and 9S4AP (190) 15, all times GMT. . . . The West Gulf DX Bulletin, W5s ALA and FXN prime movers, has these 20-meter 'phone items under surveillance: AC3PT (102) 13 GMT, GD2FRV (172) 14, M1CP (95) 14, YA2KB (108) 14, ZD3BFC (107) 19 and 4S7YL (107) 13. . . . So, Calif. DX Club's Bulletin lists 'phones CR6BX (158) 14, CS3AC (195) 17, FE8AC, FM7WN (160) 8, FO8s AB (113) 10, AD (150), AG (197) 22, OQ5FO (125) 14, VSs 1FK (47) 9, 1MK (146) 8, 2DS (96) 9, ZC7DO, ZDs 4BL (100) 14-15, 9AB (150) 6, ZM6s AL (183) 19-20, AT (161-182) 18-22, 4S7BR (105) 7, 5As 2TZ (150) 17, 3TE (110) 11 and 4TR (150) 11, times PST. . . . NNRC sources tagged 14-Mc. A3ers CR6AC, CT2AG, DUs 1AP 1AS 9JY 8 EST, EA6s 6QS 9AR 14, 0AC (150) 16, EL2X 14-15, FM7WF (172), FQ8AK 15, GCs 3EBK (100)





Though relatively a newcomer to DX ranks, DUICV of Laguna, Luzon, P. I., has done more than his share to make the Philippines available on several DX bands. Vil runs 250 watts of 'phone or c.w. (Photo via DU7ST)

17, SMF (135) 17, GD3IBQ, HISWF, HZIAB, JA7BN, KC6AA, KM6AX, KR6KS (180), KT1s LU PU WX (185), KW6BB, KX6s AF NA, OD5s AJ AP BA LC, OQ5s CX ER 13, OX3ZO, PIJ in Holland, ST2NW 16, TAs 2EFA 3AA, TG9s BG BH, VK9s BS 8, RG 7, VG YT, VPs 1AB (160), 2DA (155) 2DL 7NG 7NT 7NU 8AA (143) 20, VQs 4ERR 4EU 4EZ (149) 14, 4RF (130) 16, VR3A 7, VSs 1FE 2BS 2DB 2DQ 2DY 2EB, YN1LB (110), YO3RL 17, YSs 1MS 1O2AC, YU1s AD CY GM (148) 12, ZBs 1A1X (173), 2A (125), ZP5s CF CG, 4X4s DR 16, ED, 5As 3TC 4TN and 4TU (120-145) 15.

Twenty c.w., night-shy in northern latitudes, remains top banana for the bunch. K2GEF worked DU7SV (Volt really gets around!), HRIMC, LU 2ZC 8ZS of So. Shetlands, VP8AQ (10) 22-23 GMT of So. Orkneys, VU2EJ (40) 2, Y12AM (65) 21, ZC4GF and a KM6s..... W4YHD raised CRs 6CS 7AG (15) 9, EAs 8BK (45) 11, 9DF (55) 11, FQ8AN, GD3IBQ (36) 12, IS1TAW, ST2AR (10) 19, VP2s GW, KB (100) 23, VQs 2AB (20) 19, 4RF, ZE5JA (73) 18, ZS3AH (80) 20, 3V8AN (102) 5, OQ5s CP (15) 22, GU RA (40) 13 and a flock of KA brethren, all times GMT..... FY7YE (61) 17 EST, MP4BBL (87) 11, UB5KAB, VQ8CB (60) 11, VU2FX and ZM6AX chatted with WSDAW..... ZD6BX picked up FB8s BC BN BR NX, SU1CN, VK1PG (14) 15 GMT, VSs 1BJ 1EG 1EW 1FE 1GG 2DF (15) 15, 6CG 6CW 9GV, VU2AN, YO3RF (78) 15, ZC4NA, ZD2DCP, ZS8D, 4S7s KH LB NG NX (66) 15, 4X4s BX DH and DR..... KM6AX (60), VP7NG (10) and VP8AA (15) wound up in W7UAB's ledger..... Nearing the century mark, W1WAI grabbed HA5KBP (71) 18 GMT, IS1AHK (67) 20 and LZ1KAB (81) 17-18..... CNs 2BE 8FQ 8GB, F9QV/FC, an FQs, a GD3, KV4AQ, OQ5s BB BQ, OX3UD, OE13USA, SV1SP, VP7NN, YO3s 3GY 6AW, ZBJJR, ZE5JE and CP4MT answered W3UXX..... CN8FL caught FK8AC, KR6LP (65), KX6BF (50), MP4BBE, VR2AS (30), YN1AA, ZK1AB (35) 6 GMT and 4S7HK.....

Among K2BZT's monumental assemblage we find CR7LU 14 EST, CT3AV (50) 13, FQ8AT 15, FF8AJ 17, HZ1HZ 11, JAs 4AF (69) 18, 6AD (66) 18, 9CA (70) 18 (not two), KAs 2CG 2CR 3SV 9MF, LU9ZM (86) 17, VQ2AB (90) 16, a VQ6, YO3RD, ZE2JC (86) 15, a ZD6 and ZS3T (20) 16. This makes it 129 for Hayden..... Here and there, W2OLU hooked; FM7WP (42) 16 EST, a VP7, W7AHX; CT3AB, EA9AP, ZB1BF, W0VFM: VP6GT (76) 22-23 GMT, W9UKG: FY7YZ (32) 11 CST, CO2SW: CE0AD (18) 23-0 GMT, CR5JB, EA0AB, LUs 1ZT 7ZM, MP4BBL (20) 15, ZD4s AB BK, ZSs 7C 9L, VE5HR: YU2DU (20) 15..... WGDNC 14-Me. c.w. pickings: CP3CA (50) 21, CR6CJ (45) 20, ETs 2PA (62) 23, 3S (55) 19, FK8AO (75) 6, FQ8AG (68) 21, GC4LI (95) 14, OD5BA (65) 14, OY2Z (2) 23-0, VP8BE (57-78) 1-2, VQs 4BNU (38-50) 18-19, 6LQ (67) 14-15, VRs 2AA (30) 3, 3A (63) 3, 2RO (G2RO), ZE3JA (95) 0, ZS3s K (20) G (72-100) 19-20, T (18) 21 and 4X4CK (52) 14, times GMT..... NCDNC offerings: FG7XA (20) 14, FR7ZA (20) 15, GC2FZC (20) 15, HK6AI (71) 15, HZ1AB (79) 15, MP4s QAH (12) 15, QAJ (39) 15-16, SP2KAC (59) 15, SV0WL (51) 15, TA3AA (26) 15-16, UA9KAB (64), VK9RII (72) 5 of Norfolk Isle, VQs 2JN (60) 20, 4EZ (24) 15, VS4HK (47) 16, YO3GY (45) 15, ZB1EB (88) 16, ZC4IP (94) 15, ZD3BFC (40) 20, 4X4s AM (53) 15-16, CK (88) 15-16 and GY (58) 17, all PST..... Noted by SCDNC: C3AR (22) 23 PST, KG6IG (65) 20-21 of Chichi Jima, KJ6AN (40) 18-19, VK1s AC

(20) 22, EG (36) 22-23 of Antartica, and VQ8CE (11) 10 of the Chagos.

Forty c.w. served up EAs 8BF (10) 3 GMT, 9AP (1) 22, 9DF (30) 7 of Rio de Oro, HA5KBA (12) 22, IS1AHK (10) 22, KC6CG (20) 12, KG6GX (30) 12, LU7ZM (24) 3, ST2s AR (2) 0, NG (7) 1, VK1AC (7) 12, ZS3K (30) 5, 4X4s DE (10) 0 and FW (35) 2 to W4YHD..... ZD6BX accounts for JAs 3AA 6HK, VU2BY and 4S7NX on 40; 4S7DJ got away..... W2ESO collected LZ1KAB, an ST2, VK9AU (15) 6 EST, VS9AS, VQ2GW 20, ZL2QN/VQ4 (30) 20, 4X4RE 17; HZ1HZ, OD5AX and other LZ1s were heard..... W6CAE and K6EC nailed down ZD6BX (24-28) 14-15 GMT..... W6LRU worked CE3AG (12) 9 PST, DU7SV (28) 12 and FK8AO (38) 6. Don stalks FB8XX 15 and FR7ZA 15 on the low edge..... 7-Me. c.w. doings at this shack and that shack, at W1APA: LU3ZB, VP6GT, W1H1A: HR1JZ (20) 12 GMT, K2ALA: IT1TAL, HK1TH, TI2PZ, YU3ABC, YV5DE, W3WPG: HA5KBA, OQ5GU, PJ2CE, YS1O, J8DAJF: FG7XA (9) 18 EST, W9UKG: HK6AI (75) 5-6 GMT, LU2ZL, a VP6, CN8FL: AP2K (70), VS6CG (20), DL4ZC: ZE6JJ, KP4KD: VP8AZ (30) 8-9 GMT..... 7-Me. customers CRs 6AC (17) 18-19, 7BC (27) 5 GMT, 7CI (24) 3, HK4EF (20) 20, HR1AA (28) 20, LU7ZO (28) 6, OQ5GU (28) 5, VPs 7NG (23) 5, 8BE (22) 6 and ZS3K (37) 5-6 are recorded by WGDNC..... SCDXC



VR2CD's consistent Fiji signal easily will be recalled by the DX crowd. Chas, is shown here during a stop at ARRL Hq. while recently touring the U. S. A. with his family as VE7ASL/W/mobile. Ultimately, ex-VR2CD plans to settle down in Hawaii to await a future K116 call sign.

cohorts add EL2X (5) 7 PST, FP8AP (40) 18-19, JA1AA (23) 7, VK1RJ (25) 5, VP8AD (12) 0-1, VQ6LQ (30) 7, VS1FE (16) 8, ZMs 6AI (1), 7AL (1) and ZS7D (35) 7.

Forty 'phone, tough as nails, furnished DU7SV and HP3FL for W7AHX..... HC1MB, HK6AI (204) of San Andres, KG4AJ, TE2WLC, VPs 5SC 6FR and YV5AJ used 7-Me. A3 with WIAPA..... NNRC lists 40-meter radiotelephone activity by CP1BG, HP1TS, HR1AT, DU1s 1EC 1GF 6IG 7NO 9JM, dozens of JAs, KC6s AA CG UN, KG6GX, KV4BD, OA2A, many VKs and ZLs, YN4CB, YV5EX, ZS6s BW and DW (85) 23 EST.

Eighty c.w. mainly was featured by the pursuit of ZDs 2DCP (11) and 6BX (99) by the East Coast crew; and DU7SV plus VR3A by the West Coast contingent..... Europeans were the most common commodity and K2BZT found about a dozen Gs, several DLs, Elms 4X 9J, CT1BT, three PA6s, G15UR and OK1KBW available..... Watch for ZD6BX around 3600 ke. between 9 and 10 EST

..... KP4KD went to 'phone to clinch Dominican Republic, HI6TC on 3900 kc.; a fast QSL resulted.

One-sixty c.w. saw many hands preening for this season's transatlantic efforts. TI2BX put a new country on the band; Ws 2EQS 2GGL 3RGQ 8ANO and 9PNE were among his lucky pursuers in late October..... G6GM got across to W1BB and W2EQS; G3PU swapped 1.8-Mc. reports with W1BB..... Quite a few rather rare Africans and Asians have reported 160-meter interest. Depending on conditions, we may see several new top-band "firsts" claimed in 1955.

Ten 'phone and its mercurial openings require quick work. Using his new 10-clement rotary with corner reflector, W4NQM cashed in on 28-Mc. 'phones CE5 2HJ 3CZ, CR6BX, CXs 2CN 3AA 4CS, HCIs MB RT, LU5 3AAT 4AAR 4DJT 7DAA 8FP 9AQ, PYs 2CK 4AS 4EM, TI3LA,



JA6AD has one of the more potent 14-Mc. Asian signals these days and has accounted for over 125 ARRL DXCC List countries since activating in December, 1952. Hiro runs 300 watts to the transmitter at right. (Photo via W1YYM)

VPs 2MY 6WR, VQ2FU, XE1IQ, YVs 3BK 5AB, ZSs 4CX and 6OP..... 28-Mc. A3 luck here and there, at K2AJD: KV4BI, KZ5s, a VP2, W3EDI: HR1AA, W3ESE: LU4AAT, PY4PQ, W3QMG: LU3BQ, a VP2, ZS1KK, W0BJP: CE5GG, CX1GG, PY7HS, ZS4CW..... G3IDG finds ten open for DX on about one day out of four. Allan has heard FAs 3JY 9RZ, LU5 IDJC 3AQ 5DC 9AG 9AW, OQ0RU, PYs IAGP 2AHS, VQs 2NS 4RF, ZD3BFC, ZS6s CV SG WW and ZK. All save FA9RZ were using voice. Other GPs were heard calling or working CN8s, OQ0DZ and ZP stations..... Out west, W6NJU QSOd CE3QJ, CX3AA, KH6PM, LU6AB and a PY2. Who will claim the first 1955 WAC on 28 Mc.?

**Where:**

ARI General Secretary HAXD writes that all Trieste-bound QSLs now can be sent through ARI, Via Paolo 10, Milan, Italy, or by way of IIBLF/Trieste who is ARI's manager for the Territory..... W2FCT has VP3JM's log for the period Sept. 20, 1946, to Oct. 10, 1948. If you still need Andy's QSL, send a stamped self-addressed envelope plus full QSO data to W2FCT's Call Book QTH..... F7BM is another who recently received a UB5CF QSL direct from Odessa. Several other UB5s now answer to the address to follow..... "All QSLs for NE6AM QSOs have been sent and anyone not receiving his please notify W6COH." Stations who worked other Todos Santos XE6s in August and who still need QSLs are also advised

Here's the op and set-up responsible for providing hundreds of Liechtenstein QSOs and many a new country for DXers throughout the world. He's Kurt Bindschedler, HB9MX, active as HIBMX/IE on many 1954 week ends using mostly 15, 20 and 40 meters, 'phone and c.w. The rig is a Collins 310 and the receiver a Philips CR-101. HIBMX/IE has rolled up over eighty ARRL DXCC List countries since last September. (Photo via HE9RZF)

to contact W6COH who will alert the operators concerned..... From W1JDE: "I was formerly TG9FG in Guatemala and worked more than 3000 stations while stationed there. While I QSLd 100 per cent I feel that there are many hams who did not receive my QSL cards because of the poor mail situation there." Send QSO particulars to W1JDE if you still need his TG9FG pasteboard. He has his Guatemala logs and plenty of QSLs..... You must thank W1s APA UED WPO YYM, W2s MLO OLU, W3s SOH UKO WPG, W5KUC, WSDAW, ZC4FB, NNRC, WGDXC and 200-DXC for running down the following addresses:

C3AR, OARMA, APO 63, % Postmaster, San Francisco, Calif..... ex-CN8EG, D. R. Thrasher, WSPHX, 6521 Berwyn St., Garden City, Mich..... ex-CN8FL, Narvel W. Reece, WSEZF, 1578 Van Zandt Rd., Cincinnati 31, Ohio..... CN8IB, Norm Kiernan (W1ZIN), Navy 214, Box 40, FPO, New York, N. Y..... CO2OS, Box 2425, Havana, Cuba..... DL2WO, K. G. Summerhiend, Sgts. Mess, RAF Sudern, BAOR 39, Germany..... FY7YZ, Box 7, Cayenne, French Guiana..... HA5KBA (QSL via HSWRL)..... ex-HH3DM, D. J. Morris, W0EMN, City Engineer, Waverly, Iowa..... HPIEV, E. Valencia, P.O. Box 1728, Panama City, Panama..... ex-KM6AB (QSL to KH6WW)..... ex-MD5BY (QSL to G3IUU)..... MD5DD (QSL via RSGB)..... OX3KM, K. Madsen (OZ4KM), Nipstat Loranstation, Disko Oen, Greenland..... ex-OX3KS, Knud Sorenson, Valbygaard Skov pr. Frederikslund st., Denmark..... OX3ZO (QSL via EDR)..... PY1CK (QSL via LABRE)..... ex-SU1MK (QSL to G3IGU)..... ex-TA3MP, Meade M. Padgett, K6EWZ, 428 Alameda Rd., San Anselmo, Calif..... ex-TG9FG, F. W. Greene, W1JDE, 4 Ryder Dr., Woburn, Mass..... TG9MB, Box 115, Guatemala City, Guatemala..... TI2RMA, P.O. Box 1523, San Jose, C. R..... TI2WZZ, J. R. Acuna, P.O. Box 923, San Jose, C. R..... UB5KAB, Box 52, Odessa, Ukraine, U.S.S.R. (airmail only)..... UB5KFFX (see UB5KAB)..... VK6KJ, B. H. Gates, % A. K. Collins, Stirling Tee, Albany, W. A., Australia..... VP2GW, Box 108, Grenada, Windward Islands, B. W. I..... ex-VP3JM (QSL to W2FCT)..... ex-VP4LK, D. C. Gittens, 68 Honor Oak Rd., Forest Hill, London SE23, England..... VP6KL, F. Roberts, % Ash & Watson, Ltd., Broad St., Bridgetown, Barbados, B. W. I..... VP7NN (QSL via W3RUZ)..... VQ3CF, H. A. Seaman, P.O. Songea, Tanganyika Territory..... VQ4FB, 1/P Ward, Signals Officer, Kenya Police Div. IIq., Meru, Kenya..... VQ6LQ, Box 11, Hargesa, British Somaliland..... VQ8CB (QSL to VQ8AB)..... VR2AA, % RNZAF, Lanthala Bay, Fiji Islands..... ex-YI3BUX (QSL to G3BUX)..... ZB1CH, Point de vue Hotel, Rabat, Malta..... ex-ZB1EB, (QSL to G3IJU)..... ZC4RH (QSL via ZC4IP)..... ex-4S7XG, (QSL to G3HVG).

**Whence:**

Asia — "Activity in ZC4 is on the upward trend again. ZC4GF is concentrating on 160 meters, 50 watts to a half-wave wire; ZC4CK is on 40 meters; ZC4s CA and PB are on 20 and 40; ZC4PB hopes to get on 160 and ZC4CA will have a week or two on top band before packing his sea baggage for the U.K.; ZC4MW is temporarily QRT; ZC4IP is, I believe, on 40, 20 and 15; and ZC4RH is a new one." This from ZC4FB who is giving 20 and 40 a final fling before he heads back toward England..... Don't throw away your old Asian QSLs — JARL (Japan) has under consideration an All-Asia DX award to be avail-



able on a world-wide basis. . . . 487XG goes back to G3HVG after over three years of diligent Ceylon DX work. . . . Oender Tuezualp, Hamamoune Firin Sok No. 16/1, Ankara, Turkey, is a would-be Turkish ham who desires to correspond with W amateurs. He'll soon QSY to the U. S. for schooling. . . . W4TBQ, active since 1935 as WIPEF, W6NQY and KA1AC, expects to replace W6OME as one of TA3AA's 1935 operators. . . . Ex-TA3MP schedules an assault on his Turkey QSL backlog, circumstances ensuing from QSL orders that went astray. Check Meade's present K6EWZ QTH in "Where." TA3s AA, Ankara; US, Izmir; WD, Izmir; and TA2EFA, Ankara, still represent Turkey on ham bands. TA3QN also is in Turkey but for security reasons cannot QSL. . . . The hamshacks of VS6AE, JA8AG and KA2CC were visited in person by W0YDZ/KG6. . . . Recent geopolitical developments may have put a damper on future FN7-FN8 amateur operation. CR8AB continues to represent Portuguese India DX interests on 20 meters.

**Africa** — Illumination of Dark Continent DX doings thanks to ZD6BX: "ZD6EF now is postmaster at Blantyre and is rebuilding; he has a low-power rig on 40 temporarily. VQ5BVF, active on 15 'phone, reports several VQ5s on U.K. leave. VQ5EK is on 20 'phone. FB8BR is a new one in Tananarive with 20 watts on 20 c.w. SU1XZ operates all bands, 160 through 10 meters. ZS91 'is getting some QSLs off soon.' ZS7D continues very active on 40 c.w." As for his own installation, Vic pens: "ZD6BX now is mainly on 15 meters, with occasional forays on other bands." He hopes to rack up some 3.5-Mc. DX this season but b.c. QRM makes it necessary to operate around 3600 kc. ZD6BX's power goes off from 2100 to 0400 GMT, considerably restricting night DX activities. . . . CN8s EG and FL return home to W8s PHX and EZF, respectively, where they're willing to clear up any outstanding QSL matters (see "Where"). . . . AAEM (Morocco) sponsors an interesting DX award based on 30, 25, 20, or 15 CN8-contact QSLs, the requirements depending on one's location. It's called *Diplome de l'AAEM*. For full details write *L'Association des Amateurs Emetteurs du Maroc*, B.P. 2060, Casablanca, Morocco. . . . EA9DF still is bent on 1955 Iñi activity. . . . QSL managers are familiar fellows, bless 'em, but here's a new sign of the times: EL2X and CN8MI act as *QSO managers* for ZD3BFC.

**Oceania** — Hats off to ZK1BG for alert monitoring and quick action in October when he did much to assure the rescue of adventurer Willis and balsa raft *Seven Little Sisters* near Samoa. . . . From the *DXer*: Ex-PK4DA is back in Indonesia for a spell but reports little possibility of ham activity there in the near future. . . . SCDXC advices: VK1HM and ZC2AC are QRT, their silence to be followed by that of ZC2AD who leaves the Cocos next month. Thus ZC2-land joins Christmas Island (ZC3) in the amateurless category; ZC3AB is in Australia and ZC3AA never activated. Don't forget that G2RO plans operation on Cocos around February 6th-8th. FO8AG swapped islands, Makatea for Tahiti, and VK1AC returns to VK3IB. The ex-FO8AJ team is thinking of possible DXpeditioning in the ZM17 area next summer. VR3A looks forward to more 40- and 80-meter work as well as a 1956 visit to California. VR2BZ continues his RNZAF flying visits to VR5, ZM7 and other areas, firing up a rig whenever he has the opportunity. ZM7AL (ZM6AL) is intermittently available on 40's low edge.

**Europe** — IIIVIAA hit the airwaves far behind schedule and QRT'd far ahead of schedule. W4YIID reports that only two contacts were made, both of these on 14-Mc. 'phone (no Ws). . . . F7s BM DH and DZ are hard at work ironing out plans for a more tightly-knit F7 ham

organization replete with hamfests, call book and local nets. Club secretary K2JCS notes that DL2WW (W2FKO), ON4ZI and YU1GM (W4GMP) probably are the only Americans operating ham stations in their respective countries or licensing areas. . . . In the wake of the recent Trieste settlement, AG2s and MF2s go off the air in favor of 11 licensees. MF2AA reports that the Trieste DX award rules now conform to omit reference to AG2 and MF2 prefixes. . . . Contact GW8WJ for info on the Tops C.W. Club, a group of code-hounds with members in 21 countries. . . . In QSO with W8DAW, UB5KAB states that certain U.S.S.R. "collective stations" are authorized to QSO outside the curtain. Finally? Now how about some UIs ULs and UMs.

**South America** — Coöperative LABRE Secretary Flavio Serrano now spots call sign PY1CK. . . . W2OHF was notified by PZ1RM that PZ1AL unfortunately has joined the ranks of Silent Keys. . . . "Chilean transport *Esmeralda* now is on its way to Easter Island and I expect to have at the end of November a copy of CE0AD's log for the communications he has made from the beginning of the year to date," writes CE3AG, ex-CE0AA. Luis then will be able to answer the 300-plus pasteboards RCC has received for CE0AD. CE0AC returned to Chile and will QSL the few contacts he made. Conditions on Easter remain inhospitable to hamming, the main difficulty being lack of generator fuel.

**Hereabouts** — CO2SW breaks a long silence and clews us in on Cuban DX doings. Active DXers down Sergio's way are CN9AA, CO2s BM CT OE OM WD SW, CO7AH, all c.w.; CO2s BL and OZ on 'phone. CO2CT is cranking up a new rotary and kw, while CO2SW rebuilds toward faster bandswitching. Sergio needs tracers on former EPIs C AL, MD5PC and KC6WA, all worked in '47 and '48. . . . September 18th, at Chicago, the annual W9-DXCC meeting drew the attendance of over 40 DX sharpshooters. W9s PNV TRD and ARRL QSL Manager W9CFT headed an entertaining program. W9s ABA ABB AEH AMU DHT ESQ EWC FDX FID FJB FJY FKC GDI GIL GRV HUZ IOD IU JIP JFF JUV KA KXK LI LNM MZP NN PGW QIY RBI RHA RKP RQM TKV UXO UNO WFS WKU and YFV were on hand. W9s FID FKC NN and QIY were elected to the W9-DXCC executive committee for the new year, W9FID as chairman. . . . W6s CAE BZE CHV GBG MGT, K6s DGB and EC invaded W6LRU's abode in early November for a meeting of the San Diego DX Club. Don looks for hints on how to pry QSLs from VK1s AF RL, ZM6AA and 5A2TR. . . . The Fourth Informal Get-together of New England DXCC Members, held at Cambridge, November 4th, saw dozens of DXers enjoy a program featuring W1DX, W1FH and ARRL QSL Manager W1JOJ. Many of the gang could swap tales of antenna damage at the hands of YLs Edna, Carol and Hazel. . . . Ex-IH3DM is QRX at the "Where" QTH for those who still need his QSLs. . . . W0PRM would like lines from hams interested in, and specializing in, QRP DX. . . . W6YY knocked off the NZART (New Zealand) WAP award, the first U. S. A. station to earn it on 'phone. . . . A letter from Hallcrafters Co., Chicago, to W2MLO mentions the possibility of future DXpeditions à la FO8AJ. QRV! . . . W2WC rolled up 173 ARRL DXCC List countries, 117 on 7 Mc., then moved from Brooklyn to become WIWY. . . . W9VND is glad to be ex-W8GTV and is back in DX business just outside Chicago with 100 countries worked in less than four months. . . . The *DXer* mentions possible February T19 activity courtesy W6MHB. Also that W6RRG, now in the Bahamas, may see some ZDS activity. . . . Don't forget the gala joint meeting of the Southern and Northern California DX Clubs scheduled for the 15th and 16th of this month at Hotel Californian in Fresno. All DXers are welcome — waste no time in contacting meeting chairman W6TI for arrangements. . . . OT KP4KD, now over the 200-mark confirmed, could use suggestions toward MP4BAU and VS9AP QSLs.



A veritable European pile-up was snapped at the Yugoslavia International Hamfest held last August in Ljubljana. From left to right are well-known DXers YU1GM (W4GMP), OZ1FM, SV1SP, G2MI, DL1DH and OE5IH. (Photo via YU1AD)

**QST for**

# 21st ARRL International DX Competition

*'Phone: Feb. 11th-13th and Mar. 11th-13th;*

*C.W.: Feb. 25th-27th and Mar. 25th-27th*

**A**MATEURS all over the world are cordially invited to take part in the 21st ARRL International DX Competition, to be held four week ends in February and March. U. S. and Canadian operators will be trying to add to their DX country totals, other stations to work needed states and provinces for their WAS and WAVE awards, and everyone to match operating skill with others in his country or ARRL section.

Two week ends are devoted to c.w. and two to 'phone operation, giving everyone a chance to participate on both 'phone and c.w. "Rest up" periods are provided between week ends.

The rules of the contest are the same as those of last year, with this exception: U. S. and Canadian amateurs will send a signal report plus their state or province (instead of indicating input power). This information is of special interest to overseas stations aiming to fill in states for WAS and provinces for WAVE.

As in the past, certificate awards are offered to the top single-operator 'phone and c.w. scorer in each country and ARRL section. A special category recognizes multiple-operator stations in those sections or countries from which three or more valid multiple-operator entries are received. Within a club, single-operator entries can compete for the club certificate awards given to the highest c.w. and 'phone scorers. A handsome gavel is also offered to the club whose members run up the highest aggregate score.

Stations outside W (K) and VE/VO will call "CQ W/VE" or "CQ TEST" and trade contest exchanges with U. S. and Canadian participants. Those overseas, just as in past years, will transmit 5- or 6-digit numbers, the first numbers indicating the signal report and the last three the power input. Stations with 500 watts input would use a power number of 500; those with 25 watts, 025.

## EXPLANATION OF DX CONTEST EXCHANGES

### Stations in U.S. and Canada Send:

	<i>RS or RST Report of Station Worked</i>	<i>Your State or Province (or Abbreviation)</i>
Sample (c.w.)	579	VT
Sample ('phone)	57	Vermont

### Stations Outside U.S. and Canada Send:

	<i>RS or RST Report of Station Worked</i>	<i>Three-Digit Number Representing Your Power Input</i>
Sample (c.w.)	579	075
Sample ('phone)	57	500

## CONTEST TIMETABLE

### 'Phone Section:

<i>Time</i>	<i>Starts</i>	<i>Ends</i>
GMT	Feb. 11th 2400	Feb. 13th 2400
AST	Feb. 11th 8:00 P.M.	Feb. 13th 8:00 P.M.
EST	Feb. 11th 7:00 P.M.	Feb. 13th 7:00 P.M.
CST	Feb. 11th 6:00 P.M.	Feb. 13th 6:00 P.M.
MST	Feb. 11th 5:00 P.M.	Feb. 13th 5:00 P.M.
PST	Feb. 11th 4:00 P.M.	Feb. 13th 4:00 P.M.

The second period of this contest starts at these same hours  
Mar. 11th.

The second period of the contest ends at these same hours  
Mar. 13th.

### C.W. Section:

GMT	Feb. 25th 2400	Feb. 27th 2400
AST	Feb. 25th 8:00 P.M.	Feb. 27th 8:00 P.M.
EST	Feb. 25th 7:00 P.M.	Feb. 27th 7:00 P.M.
CST	Feb. 25th 6:00 P.M.	Feb. 27th 6:00 P.M.
MST	Feb. 25th 5:00 P.M.	Feb. 27th 5:00 P.M.
PST	Feb. 25th 4:00 P.M.	Feb. 27th 4:00 P.M.

The second period of this contest starts at these same hours  
Mar. 25th.

The second period of this contest ends at these same hours  
Mar. 27th.

*Example: JA3AF, 500 watts input, might send "569500" on c.w., "56500" on 'phone.*

U. S. and Canadian amateurs will transmit an RS or RST report *plus their state or province*, or some abbreviation for the state or province. *Example: W2SAI, New Jersey, might send "579NJ" on c.w., or say "57 New Jersey" on 'phone. Note that W (K) and VE/VO entrants will no longer indicate power inputs.*

For purposes of conformity, it is suggested that W/VE c.w. amateurs use this tabulation to indicate their states or provinces. Overseas operators may use it as a check-off list of states and provinces worked, and for logging abbreviations.

W1 — CONN MAINE MASS NH RI VT  
W2 — NJ NY  
W3 — DEL MD PA DC  
W4 — ALA FLA GA KY NC SC TENN VA  
W5 — ARK LA MISS NMEX OKLA TEXAS  
W6 — CAL  
W7 — ARIZ IDAHO MONT NEV ORE UTAH  
WASH WYO  
W8 — MICH OHIO WVA  
W9 — ILL IND WIS  
W0 — COLO IOWA KANS MINN MO NEBR NDAK  
SDAK  
VE1 — NB NS PEI  
VE2 — QUE  
VE3 — ONT  
VE4 — MAN  
VE5 — SASK  
VE7 — BC  
VE8 — NWT YUKON  
VO — NFLD LAB

You can try a "CQ DX" or "CQ TEST" if you're in U. S. or Canada, but past experience

# LOG, 21st INTERNATIONAL DX COMPETITION

Call ..... ARRL SECTION .....  
 Bond 14 Mc. Sheet 1 of 3

Country	Station Worked	Date	Time (GMT)	Sent	Received
Lebanon	OD5AX	2/26	1300	589CONN	479075
	OD5AV	2/26	1345	569CONN	579080
England	G6CL	2/26	1306	589CONN	469150
	G2MH	2/27	1245	579CONN	469125
	G3KP	2/27	1255	569CONN	579100
	G5BA	3/26	1430	469CONN	559100
	G6ZO	3/27	1822	579CONN	589125
	G5RI	3/27	1851	469CONN	459075
Germany	DL1KB	2/26	1315	559CONN	449050
	DL1DX	2/27	1149	469CONN	559080
	DL1BR	3/26	1502	559CONN	559045

Sample of report form that must be used by W/VE c.w. participants. When a station is worked for less than the maximum number of points allowed, the additional contact to make up the points not earned in the first contact should be entered at the bottom of the sheet. Canadian entrants should allow two blocks for each country, but may record no more than eight contacts therein. A separate set of sheets should be used for each band.

«

shows that this does not pay off very often. On c.w. W/VE amateurs have quotas, but this doesn't apply to 'phone. Amateurs overseas have no quotas; they will attempt to QSO as many stations in the 19 W (K) and VE/VO licensing areas as possible on each band, 160 through 10 meters.

Keep your log carefully and send a copy of it, in the form shown, to ARRL. Free contest forms are now available upon request from ARRL, West Hartford, Connecticut. Get your station functioning at top efficiency, make no social commitments for the important week ends, read the rules to acquaint yourself with the details, and then get set for DX aplenty.

## Rules

- 1) *Eligibility:* Amateurs operating fixed amateur stations in any and all parts of the world are invited to participate.
- 2) *Object:* Amateurs in the continental U. S. and Canada will try to work as many amateur stations in other parts of

Sample of report form that must be used by W/VE 'phone entrants and all participants outside U. S. and Canada, 'phone and c.w. This example is a U. S. A. 'phone log. Foreign competitors, of course, would have reverse information in the "Sent" and "Received" columns; their "Received" column would show exchanges like "579CAL," "589ONT" (or, on 'phone, "46 Vermont," "58 Georgia," etc.), indicating signal reports received and different states and provinces worked; their "Sent" column would carry signal reports and power indicators transmitted.

# LOG, 21st A.R.R.L. INTERNATIONAL DX COMPETITION

Sheet 1 of 1 Call ..... ARRL Section ..... or Country .....

Date & Time GMT	Station Worked	Country	Record of New Countries for Each Band							Exchange		Points
			1.8	3.5	7	14	21	27	28	Sent	Received	
Feb. 12 0005	HR1FM	Honduras				1				56 Maine	57080	3
Feb. 13 1300	PA6ULA	Netherlands							1	58 Maine	47075	3
1306	G3COJ	England							2	58 Maine	46150	3
1345	PA0VB	Netherlands							2	56 Maine	59080	3
2030	LU1DDV	Argentina							3	58 Maine	57750	3
2310	VP9X	Bermuda				2				57 Maine	56050	3
Mar. 12 1020	ZL1MB	New Zealand				3				58 Maine	58075	3
1035	VK5XN	Australia		1						47 Maine	46100	3
1105	VK2RA	Australia		1						46 Maine	45100	3
1421	PA0XD	Netherlands							3	45 Maine	57100	3
Mar. 13 0925	EI9A	Ireland				4				57 Maine	57050	3
1245	G2PU	England							3		46125	2
1255	G3DO	England							3	56 Maine	57100	3
1350	G2PU	England							3	57 Maine		1
1430	G5BA	England							3	46 Maine	55100	3
2320	KZ5DG	Canal Zone				5				58 Maine	58500	3

# SUMMARY, 21st A.R.R.L. INTERNATIONAL DX COMPETITION

Entry Call.....ARRL Section.....or Country.....  
(C.W. or 'Phone)

Name.....Address.....

Transmitter Tubes.....Power Input.....

Receiver.....Antenna(s).....

(Logs from W(K) and VE/VO show number of foreign countries worked. Logs from other countries show number of U. S. A. and Canadian call areas worked.)

Bands	1.8 Mc.	3.5 Mc.	7 Mc.	14 Mc.	27 Mc.	28 Mc.	Total
No. Countries QSO'd		1		5		3	*9
No. of Contacts		2		5		8	15

Number of Different Countries Worked.....Number of Hours of Station Operation.....

Assisting Person(s): Name(s) or Call(s)

45 9 465  
..... × ..... = .....  
(Points) (Multiplier) FINAL SCORE

Participation for Club Award in the.....  
(Name of Club)

I certify, on my honor, that I have observed all competition rules as well as all regulations established for amateur radio in my country, and that my report is correct and true to the best of my belief. I agree to be bound by the decisions of the ARRL Award Committee.

Operator's Signature

\* Figure in this box is multiplier.

Sample of summary sheet that must accompany all reports.

the world as possible under the rules and during the contest periods.

3) *Conditions of Entry:* Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

4) *Entry Classifications:* Entry may be made in either or both the 'phone or c.w. sections: c.w. scores are independent of 'phone scores. Entries will be further classified as single- or multiple-operator stations. Single-operator stations are those at which one person performs all the operating functions. Multiple-operator stations are those obtaining assistance, such as from "spotting" or relief operators, or in keeping the station log and records.

5) *Contest Periods:* There are four week ends, each 48 hours long: two for 'phone work and two for c.w. The 'phone section starts at 2400 GMT, Friday, February 11th and Friday, March 11th, ends 2400 GMT, Sunday, February 13th and Sunday, March 13th. The c.w. section starts at 2400 GMT, Friday, February 25th and Friday, March 25th, ends 2400 GMT, Sunday, February 27th and Sunday, March 27th.

6) *Valid Contacts:* In the 'phone section, all claimed credits must be made voice-to-voice. In the telegraph section, only c.w.-c.w. contacts count. Crossband contacts may not be counted.

7) *Exchanges:*

a) *Amateurs in U. S. and Canada* will transmit a three-figure number, representing the RST report, plus their state or province. (The latter may consist of an appropriate abbreviation.) 'Phone participants will transmit a two-figure number consisting of the readability-strength report plus the state or province. *Example:* W1ATE in Connecticut might transmit "579CONN" on c.w., "57 Connecticut" on 'phone.

b) *Amateurs outside W (K) and VE/VO* will transmit six-figure numbers, each consisting of the RST report plus

three "power" numbers; the power indicator will represent the approximate transmitter power input. 'Phone contestants will transmit five-figure numbers, each consisting of a readability-strength report and the three "power" numbers. *Example:* VK2EO, with 100 watts input, might transmit "569100" on c.w., "56100" on 'phone. If the input power varies considerably on different bands, the "power" number should be changed accordingly.

8) *Scoring:*

a) *Points:* One point is earned by a W (K) or VE/VO station upon receiving acknowledgment of a contest exchange sent, and two points upon acknowledging an exchange received. Two points are earned by any other station upon receiving acknowledgment of a contest exchange sent, and one point upon acknowledging an exchange received.

b) *Final Score:* W (K) and VE/VO stations multiply total points earned under Rule 8(a) by the number of countries worked on one band plus the number of countries worked on each other band. All other stations multiply total points earned under Rule 8(a) by the sum of the number of W (K) and VE/VO licensing areas worked on one band plus the number of W (K) and VE/VO licensing areas worked on each other band.

Countries will be those on the ARRL Countries List. There are 19 licensing areas: 10 in the United States, 9 in Canada (VO, VE1-VES). [See Countries List on p. 60 and Footnote 1 on p. 132 — Ed.]

9) *Repeat Contacts:* The same station may be worked again for additional points if the contact is made on a different frequency band. The same station may be worked again on the same band if the complete exchange for a total of three points was not made during the original contact on that band.

10) *Quotas:* The maximum number of points per country per band which may be earned by W (K) stations in the  
(Continued on page 132)





# Operating News



F. E. HANDY, WIBDI, Communications Mgr.  
R. L. WHITE, WIWPO, Asst. Comm. Mgr., C.W.  
PHIL SIMMONS, WIZDP, Communications Asst.

GEORGE HART, WINJM, Natl. Emerg. Coördinator  
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., 'Phone  
LILLIAN M. SALTER, WIZJE, Administrative Aide

**Proven Operating Ability.** Some test their mettle as operators in the "SS" — others have a fine time and roll up accomplishments by brief daily participation in their Section traffic net. There's no better way to become an expert in procedure and the ability to copy accurately. The fullest enjoyment of all that amateur radio affords in working DX and other operating specialties goes hand in hand with operating ability and copying proficiency. This month we're glad to start honoring those consistently turning in BPL-dimensional totals by listing the first to receive the Traffic Medallions. See the rules and first announcement in August *QST* if you need more information. Any individual amateur working at his own station is eligible.

Speaking of "copying down" ability, ARRL provides to all comers daily transmission of code practice at stated speeds aimed at assisting newcomer and old-timer alike in knowing where he stands on the matter of copying ability. If not ARRL-certified, be sure you look for W1AW or W6WOP on their next Qualifying Runs. Send us what you get to be considered for certification. Don't stop with an initial speed unless at the top. Stay with us until you have the full set of endorsement stickers. Prove to yourself and others what you *can* copy, and at the same time you will have extended the range of what you can do in communication with amateur radio. If your casual hamming has never gone ahead to include DX countries and traffic ability along with some experimenting, this can be a suggestion to expand know-how and horizons in the New Year.

We've heard the sad story of the fellow who flunked the exam because he "guessed" he knew enough to pass. Few that have copied over the air until they got their 10-w.p.m. certifications

(instead of maximum) progress. We mention this just to suggest, in starting the year, that all amateurs and amateur groups, including the Novice, work for new results, objectives, and top results, rather than the minimum, to get the most fun and know-how from amateur radio.

**Club Operating-Versatility Contest?** This is the season of the year when a good many affiliated radio clubs are starting their code and theory classes (and holding examinations) for the club members and other community members interested in qualifying for licenses. Also, clubs are announcing in many cases special events — a working toward WAS or competitions for the greatest number of DX QSLs that can be earned and turned in by club member operators as of some date next spring — encouraging competition between club members to help them reach these desirable goals. WILLY comes forward with an idea that it would be interesting to set aside some designated week end for a Versatility Contest. The idea would be to credit all-around station and operator ability. The "package" set-up in the operational rules would establish a quota to limit points attainable by any one means, or band, to a small number. Then *multipliers* would be applied (1) for each band worked; (2) each mode of emission (e.w., a.m., f.m., n.b.f.m., f.s.k.-RTTY, a.f.s.k.-RTTY, s.s.b., facsimile and or TV); (3) each mobile band operated 'phone and e.w. (additional multipliers to that for fixed operation); (4) multiplier for originating one message; (5) multiplier for putting this into section-NTS net (each band or mode used); and (6) for working one foreign country outside the North American continent.

## Operating Calendar for the New Year.

The first month of the year is one of the top ones of the season from the standpoint of things to do in radio operating. Stations can be tested, states got for WAS and other awards. There's the V.H.F. "SS," Jan. 8th-9th, for the v.h.f. man; for the newcomer (and others to work him) the "NR" runs from Jan. 8th-23rd — a few QSOs a day and you have it "made"; appointees look forward to their quarterly e.w. and 'phone parties the week ends of the 15th and 22nd. DX men probably will be busy getting rigs and antennas ready for the ARRL DX Competition for which scheduled periods in February and March have been announced. To attract the foreign participation the W (K) and VE/VO contingent will identify their states and provinces (helping the DX station fill out working them all!) following the signal-report part of the



ever flunked the Novice Test; and few ARRL-certified through 20 w.p.m. ever failed on their General Class code test. The majority who have trouble, we're told, are those who mistakenly try to get by or are mistakenly working for medium



exchange this time; returns from across the water being the customary six numerals. So earmark the calendar and contest announcements you are interested in, and get in the swim. — F.E.H.

OCTOBER CD QSO PARTIES

Despite the depredations of Hurricane Hazel, which roared up the Atlantic Seaboard and left some appointees minus power and antennas, our c.w. CD Party was a highly successful event. The notable exploits of top-scorer W6MUR are chronicled with the accompanying photograph. Another Californian, ORS W6BIP, earned second place with 174,265 points. Rounding out the top three, Assistant Director W4KFC made his customary impressive showing with 155,295 points. Sections-worked honors were copied by W6MUR with 67, while W4KFC led in number of contacts with 486 in just 11 hours 30 minutes on the air.

An even dozen operators in the 'phone session turned in scores over 10,000. Tops among them was the 18,150-pointer of W9KDV, with W9VFX doing the talking. And CD regulars W8NOH and W4HQX, both of whom may always be relied on for outstanding voice work, earned second and third positions. QSO leader was W9KDV with 110, and W5MFX worked the most sections, 36.

The highest scores follow. Figures after each call indicate score, number of contacts and number of ARRL sections worked. Final and complete results will appear in the January CD Bulletin.

C. W.			
W6MUR	271,953 451-67	W8TZO	67,760 235-56
W6BIP	174,265 294 65	W3TAMZ	67,500 270 50
W4KFC	155,295 486 63	W1WFE	67,320 300 43
W1MNI	147,735 462 63	W1VZ	66,375 225 59
W3RHD	146,010 468 62	W2JWH	66,290 243 62
W4HQX	141,875 468 61	W8JAR	63,335 233 53
K6FAE	127,710 215 66	W3ADE	62,910 226 54
W7PCZ	124,740 235 59	W6ZR	62,736 143 48
W1JXH	122,700 402-60	W2GXC	62,565 291 43
W1EOD	122,610 395 61	W0JTF	62,540 236 53
W7JL	116,761 216 59	W7CT	62,322 133 51
W2ZW	112,240 361 61	W2LPJ	61,965 238 51
W1ODW	105,020 356 59	W3JNQ	61,570 262 47
W3DVO	105,000 368 56	W3LMM	60,840 239 52
W8NOH	105,000 345 60	W1WLW	60,580 230 52
W1YZC	99,840 377 52	W4BDU	60,135 211 57
W7ZG	97,200 200 51		
W1RAN	97,185 335 57	'PHONE	
W7UTM	95,468 179 58	W9KDV	18,150 110-33
W2IFP	95,190 327 57	W8NOH	15,200 90 32
W9SDK	92,335 305-59	W4HQX	14,685 82 33
W3PWN	91,280 321 56	W1MRP	14,415 93 31
W4YZE	90,000 297 60	W5MFX	13,540 70 36
W4PNSK	89,040 336 53	W3EAN	12,400 75 31
W5TC	88,800 292 60	W1CRW	11,880 88 27
W1ZDP	88,000 313 55	W4FV	11,600 75 29
W6SYV	85,500 190 50	W2AEE	11,005 66 31
W1BIB	83,780 277 59	W4FE	10,850 70 31
W8GHP	83,505 286 57	W2JAL	10,270 73 26
W1WPO	82,655 264 61	W2ZW	10,000 73 25
W4WKQ	81,810 303 54	W1ZIO	8610 75 21
K6BWD	81,290 162 55	W1KFV	8295 72 21
W4LAP	79,750 275 58	W3MWL	8190 60 26
W2IYS	79,060 261 59	W9SZR	8190 55 26
W1XIL	75,870 281 54	W8PBN	7410 57 26
W1AQE	75,600 280 54	W1FZ	7140 63 21
W8HZA	74,520 270 54	W4KMS	6890 53 26
W6YHM	69,801 143 53	W5IWI	6580 44 28
W1SRM	69,390 250 54	W8ZNC	6240 52 24
W4JON	64,165 256 53	W1AQE	6200 62 30
W9CMC	69,120 322 54	W9TLL	5760 43 24
W3KLA	68,770 299 46	W4WOG	5405 47 23
W9NH	68,750 244 55	W2DLO	5400 49 20
W4WNZ	67,830 264 51	W1TRX	5355 51 21
W8LHV	67,760 235 56	W8BOK	5060 40 23

<sup>1</sup> W4YID, opr. <sup>2</sup> W3GRF, opr. <sup>3</sup> W5JXM, opr. <sup>4</sup> W9VFX, opr. <sup>5</sup> W2AIP, opr. <sup>6</sup> W3CLL, opr.

BRIEF

Myron Clowden, W1YLL, Secretary, Port City Amateur Radio Club, sponsors of the Worked All New England award, advises that the first fifty WANE certificates have been issued to the following amateurs: W1FTJ, W1BFT, W1CDX, W2JHL, W6ZZ, W1TY, W1LQ, W1VCF, W1TCR, W1VCH, W8AQ, W2NLY, W3OP, W1GKJ, W1MEG, W2QHH, W2KTU, W1WTG, W1BJP, W1EET, W1MRQ, W2JCO, W1EFN, W2RSV, W2WZ, W1FZ, W2TYC, W4HYW, W1RNA, W1GMH, W1TYU, W1BBN, W1TOP, W1RLS, W1RFC, W1JWJ, W1FPS, W1NHJ, W8AL, W1HWE, W1VZI, W1AXN, W1WJA, W1YCU, W1UZR, K2BH/W1QGU, W1VMC, W1LIG, W1VVO, W1HA. Rules for obtaining the WANE award appeared on page 63, September 1953 and page 69, August 1954 QSTs.



Any c.w. CD Party enthusiast who hasn't worked this fellow lately better turn in his receiver and headphones! Posting the nation's best score in both July and October, OO Bill Johnson, W6MUR, has really been ringing the bell. His tape fist and snappy operating bring credit to the CD gang, as does that crisp-keying "big sig" stemming from the home-brew 450THs at the right. Time was when 80 meters was thought a "must" as far as amassing huge tallies was concerned, but W6MUR does FB on just 40 and 20; in October he stacked up 151 QSOs in 67 sections for a smashing 271,953 points. Shown fingering the bng and bending over the operating table, Bill portrays the traditional stance of the inveterate DXer. Indeed, DX is his main interest. And if he can again be enticed from pursuit of Africans and Asiatics, you'll see him in the January CD!

CODE-PRACTICE STATIONS

The following schedules bring up to date the list of stations (p. 75, November QST) currently transmitting code practice in the ARRL Code-Practice Program.

W3VEJ, James Alcorn, 207½ Longfellow St., Vande-grift, Penna.; 7150 kc.; Mon. and Thurs., 2100 EST; 5-15 w.p.m.

W4ZRH, Carlton R. Commander, 17 Joyee St., Mt. Pleasant, S. C.; 3700 kc.; Mon. through Fri., 1830 EST; 5-13 w.p.m.

W0ONF, for Se Kan Radio Club, Kenneth M. Parker, Box 141, Howard, Kansas; 3805.5 kc.; Mon., Wed. and Sat., 1730 CST; 3½-15 w.p.m.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C. W.		'PHONE	
3550	14,050	3875	14,225
7100	21,050	7250	21,400
	28,100		29,640

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. — 3535, 7050, 14,060; 'phone — 3765, 14,160, 28,250 kc.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc.	7140 kc.
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The principal theme of letters being received by your NEC these days seems to be complaint regarding QRM to emergency operations on 75 meters. Before we make the comments that we're going to make, let it first be admitted that considered and impartial afterthought does not always coincide with actions or attitudes in the pressure of the moment. Or, to put it another way, it's all very well to rationalize, but not always so easy to act accordingly.

It is maddening to have someone's casual CQ break up a message concerned with the safety or life of a person or persons, and perfectly natural for one's thoughts on such occasions to be along lines of daggers, machine guns and gallows. When such QRM appears to be deliberate (very difficult to prove), and derogatory remarks are passed around ("tin soldiers," "paper policemen," etc.), it is indeed difficult to restrain a homicidal impulse; the only wonder is that all that results are numerous letters to us saying, in effect, that "there oughta be a law." We know; we've been through the wringer ourselves.

But — and here comes that rationalization — we cannot help but observe that the most crowded band in the radio spectrum is really not the best suited for emergency communications purposes. This is especially true in the evenings, when long skip conditions wash out local communication almost entirely and bring in stations from far away loud and clear. By all logic, it is ridiculous to try to pursue an emergency purpose under such conditions when it could be done easily, given the proper equipment, using a frequency band without such idiosyncrasies. Still, logic or not, the guys are *there*, on 75; most of them *cannot* use other bands, for one reason or another, so what are we going to do about it?

Several suggestions have been made. W4NV proposes establishing monitoring frequencies (3801 and 3995 kc.) and appointment of "National Emergency Broadcasting Stations" in each state to man the two frequencies during any emergency. His plan is very reminiscent of our former National Emergency Net, and reminds us to remind you that there still exists a set of National Calling and Emergency frequencies for just such purposes. W4ANK, incensed at QRM from stations participating in a contest during Hurricane Hazel, urges a national or divisional emergency organization aimed at reducing QRM on emergency frequencies, automatic conversion of traffic nets to emergency nets during an emergency, and some means of making allowance for an emergency arising during a contest.

Certain provisions already exist for emergencies, and perhaps before considering the merits and demerits of proposals being made, we should examine those which now exist. Let's do this briefly:

(1) FCC provides a measure of respite for amateurs plagued by QRM in emergencies in its Section 12.156 of the amateur regulations. This is summarized in our booklet *Emergency Communications* (p. 8), and outlines a procedure by means of which stations operating in an emergency may apply to FCC for a "clear channel."

(2) Nets of ARRL's National Traffic System are under instructions to activate themselves automatically in the event of an emergency, to handle emergency traffic if called upon. This procedure was described in an *Emergency and Traffic Bulletin* some time ago, and is due for repetition. Many non-NTS traffic nets have an agreed-upon procedure for automatic conversion for emergency purposes.

(3) As mentioned above, we still have National Calling and Emergency Frequencies. You will see these listed in a box somewhere in the Operating News section of *QST* each month (unless the space problem is *extremely* acute, when the editor usually finds room for them elsewhere in the issue). Instructions for their use are included.

The question then is: what other measures need be taken, besides plugging and publicizing present arrangements, to make our alertness for emergencies more widespread and instantaneous? Your thoughts on this question are solicited. Just in passing, however, let's also observe that QRM is a quite natural phenomenon when an amateur band is crowded six-to-a-kilocycle, and the real solution lies not in regimentation of our existing bands, but in "selecting the channel to suit the need" — a clause borrowed from *Emergency Communications*, which more of you ought to read.

— \* —

Extensive flood conditions in Northern Indiana and Illinois precipitated some activity among AREC groups, over the SET weekend of October 9-10 and extending to the eleventh. We have three reports:

(1) In La Grange Park, Illinois, heavy rains caused backup of sewers and natural drainage into the streets and basements. As the situation worsened, W9JJD called Radio Officer W9FKY and suggested some action be taken. The c.d. radio group was activated, and within a very few minutes two mobiles were in action. One of the cars worked with Water Department trucks and the other one accompanied the fire engines. At 1830 that evening as the rain continued a third mobile unit was pressed into action. Shortly afterward, calls from alarmed residents became so numerous that all three cars were placed in service answering them, each accompanied by one or two firemen. All mobiles were kept extremely busy, each with a backlog of calls, until after midnight. W9KMT and W9MAT also participated in this activity.

(2) The Calumet Area Emergency Net was called into action on October 11 by request of Hammond (Ind.) city officials as the Little Calumet River went on a rampage due to heavy rains. The Lake County Amateur Radio Club station, W9ZKW, was set up at the Hammond City Hall, with W9GRA/9 at the Woodmar Country Club in the middle of the flood area. Other fixed portable stations assisting were W9CWO/9 at Highland, W9PVQ/9 at Black Oak, W9SNF/9 at Hammond and W9RWN at East Hammond. EC W9KRJ monitored and assisted in clearing the frequency. Mobiles operated on 1805 kc. and included W9s KRJ PVQ IFC DRJ DWF JZA IBZ WFI MNO DDK UXK RXB MOC EHY UVR WTW ZJH and APO.

(3) In Indiana, the towns of Plymouth and Knox were hard hit. In Plymouth, EC W9AYP set up communication facilities at that point, assisted by W9ATT and W9LDJ with W9JWI of Culver also assisting. Both the Michiana Radio Club and the Mobile Amateur Club of St. Joseph County participated, the former keeping W9AB, the Red Cross station of South Bend, on the air. The Indiana Phone Net also greatly assisted by relinquishing the net frequency for emergency traffic when the occasion warranted. Later, a call came from Knox that help was needed in communications. Eight mobile units with two base station operators were formed into two groups, one for immediate use and the other to furnish relief when needed.

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One of the most active mobile emergency groups in the country is the Philmont Mobile Radio Club. W3JGB is NCS of the weekday "Scrambled Egg Net" on 29,193 kc. Everyone or anyone is invited to drop in on this frequency to say hello.

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**QST for**

The problem at Knox was protection of the local disposal plant from rising waters. The Mobile Amateur Club of St. Joseph County furnished the equipment and personnel. The c.d. base station, W9UB, at South Bend, acted as a base. W9YEA of Knox did most of the organizing as EC, W9AYP, W9JWI and W9YEA went many long hours without sleep in helping out.

Others not mentioned above who also assisted included W9s GAV DDE UZP AQA AQB YME ZIB CC JEG EKK ECH QWI EHZ AWN SNT QXF EOG YRF LVS MYI BRM YVR OGZ OGF SMW LVS CKR BRM NAR BRR EZS.

On August 15th, the Red Cross in four Florida counties held a hurricane drill in which amateurs actively participated. Many stations throughout the Eastern Florida section gave assistance, and stations out of state assisted in relaying traffic to Atlanta and Washington. The counties involved were Palm Beach, Broward, Dade and Monroe, an area in which reside an estimated 800 amateurs and in which 197 amateurs are registered in the AREC. Eastern Florida SEC W4IM records 73 stations as having participated, 21 of them mobile, in this well-planned and extensive exercise.

The AREC of De Kalb County, Georgia, on the Labor Day week-end repeated their July 4th performance for the Red Cross by assisting in rendering aid to accident victims in the general vicinity of the intersection of Highways 12 and 78 near Avondale, Ga., reported to be one of the worst places for highway accidents. On Friday night 75 meters was used, but QRM and QRN hampered operations, so on Monday the mobiles were shifted to ten meters. Contact was maintained mobile to mobile and with fixed stations set up at police headquarters. Seven accidents occurred within one two hour period, three of them requiring first aid and one involving three cars requiring ambulance service. Red Cross personnel were standing by at the police stations to rush to the scene wherever need was reported by the mobiles. Twelve operators participated in this "Operation Bandaid": W4s NS PUM MV EPM IPL ZUF LXR SOV RVII PDD FKE UMO.

Members of the Blossomland Amateur Radio Association of St. Joseph, Mich., assisted the Berrien County Sheriff Department in providing mobile communication during the heavy traffic period over the Labor Day Week-end. The main control station was set up at the Sheriff's office, using W8MAI/S. Alternate control stations at strategic points around the country were W8s FGB S SCS and RAE. Mobiles were W8s FGB JFW MWO JUA SCS MVO BKL QBN HKT NSA QQO FBV GTM and QFV. The boys operated in eight hour shifts, five units in service at a time. A regular uniformed Deputy Sheriff was assigned to each mobile to perform regular police duties. The frequency used was 1890 kc. Other participants were W8s MXI PQI ORM CRD YKS and WNSQOD.

Another Labor Day exercise was the furnishing of radio communication for the annual Pikes Peak races by Colorado Springs EC W0TV and his gang. The group loaded up their field gear in W0MJD's truck and took off at 0500 on September 6th. Individuals were assigned posts along the winding road to the summit, ten of them in all, to report every racer by number as he passed his post. W0WPK was at the starting line, W0HEM at Post 1 and W0EYN and W0BTI/0 at the summit, operating on 29.624 kc. for the purpose of passing official orders as requested. The others operated on 3885 kc. as follows: Starting line and NCs — W0SDW; Post 1 — W0IMC; midway between Post 1 & 2 — W0ANX; Post 2 — W0HIR; Post 3 — W0PBN; Post 4 — W0MJD; Post 5 — W0CVG; Post 6 — W0CVG; Post 7 — W0MFF; Post 8 — W0QQX; midway between Posts 8 & 9 — W0JMB; Post 9 — W0MEY; Post 10 (summit) — W0PTR and W0VCZ. W0TV was standby on either band at the starting line, operating with his receiver on the PA system so that observers at the starting line could trace the racers to the summit.

Our SECs are improving greatly in the matter of reporting. For the month of September, seventeen SEC reports were received, representing activities of 4256 AREC members, and three new sections have been added to this year's reporting roster: Arizona, Louisiana and Ver-

mont. The September record this year tops that of both 1953 and 1952, and the total number of sections for the year is now 28, compared to 22 in 1953 and 29 in 1952. We're also ahead of last year in total number of reports (135 to 114), but trailing our 1952 record of 157 at this time.

Let's keep those reports coming in, fellows!

### MEET THE SCMs

Thomas J. Morgavi, currently serving the Louisiana section in the capacity of SCM, was issued his first license in 1935 with the call he now holds, W5FMO.

A former Official Relay Station and Official 'Phone Station, he is presently an Official Observer. Since his participation several years ago in a Frequency Measuring Test with a home-built Wien bridge, he has become extremely interested in frequency measurement and has built a secondary standard, cycle counter, and other associated equipment. SCM Morgavi is active in the Greater New Orleans Amateur Radio Club and is trustee of the club station,



W5UK. Two Public Service certificates have been issued to him for his work in the 1947 Florida Peninsula-Gulf Coast Hurricane and the Big Freeze of February, 1951. He likes to handle traffic for overseas stations on MARS frequencies.

W5FMO's station layout consists of push-pull 810s in the final modulated by push-pull 805s, 600 watts on 'phone and c.w.; also a low-power BC-610 exciter, 75 watts 'phone and c.w. Receiver is an HQ-120. Antennas include an 80- and 40-meter vertical, a three-element 20-meter rotary beam, and a Marconi for the small rig. All bands 160 through 15 meters, 'phone and c.w., are used.

Tom expects to be successful in the near future in inducing his XYL, Helen, to get her ham ticket. Baseball and boxing are his favorite sports. The Corps of Engineers, U. S. Army, has employed him as radio operator and radio service engineer since 1940.

### A.R.R.L. ACTIVITIES CALENDAR

Jan. 7th: CP Qualifying Run — W6OWP  
Jan. 8th-9th: V.H.F. Sweepstakes  
Jan. 8th-23rd: Novice Round-up  
Jan. 11th: CP Qualifying Run — W1AW  
Jan. 15th-16th: CD QSO Party (c.w.)  
Jan. 22nd-23rd: CD QSO Party (phone)  
Feb. 5th: CP Qualifying Run — W6OWP  
Feb. 8th: Frequency Measuring Test  
Feb. 11th-13th: DX Competition (phone)  
Feb. 14th: CP Qualifying Run — W1AW  
Feb. 25th-27th: DX Competition (c.w.)  
Mar. 5th: CP Qualifying Run — W6OWP  
Mar. 11th-13th: DX Competition (phone)  
Mar. 15th: CP Qualifying Run — W1AW  
Mar. 25th-27th: DX Competition (c.w.)  
Apr. 1st: CP Qualifying Run — W6OWP  
Apr. 13th: CP Qualifying Run — W1AW  
Apr. 16th-17th: CD QSO Party (c.w.)  
Apr. 23rd-24th: CD QSO Party (phone)

## BRASS POUNDERS LEAGUE

Winners of BPL Certificates for October traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CTH.....	219	1974	1411	426	4030
W3WIC.....	53	973	881	71	1978
W0TQD.....	8	914	901	13	1836
W9UJ.....	17	817	635	55	1524
W9DO.....	7	662	587	82	1338
W0SCA.....	29	569	533	2	1124
W5MIN.....	36	529	396	128	1089
W0CPL.....	7	460	410	50	927
KG6IG.....	20	444	457	3	924
K6FAE.....	16	432	438	12	898
W7FRU.....	1	450	374	63	888
W4PFC.....	9	438	431	4	882
W9VIZ.....	52	402	360	29	843
W6PHF.....	42	347	307	135	831
W7BA.....	12	408	385	20	825
W4OGG.....	9	406	348	50	813
W7PCY.....	152	294	282	12	740
W2KEB.....	27	335	234	101	697
W9NZZ.....	178	254	2	252	686
W9SNT.....	65	301	263	38	667
W6LYG.....	36	306	180	126	648
W2KPV.....	22	310	295	15	642
W5TFB.....	16	316	287	19	638
W4DYR.....	497	28	43	11	579
W0BLI.....	5	284	262	15	566
W7APP.....	7	273	273	0	553
KA2MC.....	80	236	209	27	552
K5FEB.....	36	238	198	76	548
K6FCZ.....	30	256	242	12	538
W6IZG.....	5	26	261	246	538
K2BSD.....	12	262	247	15	536
W1UKO.....	10	263	250	12	535
W2RIU.....	34	267	185	39	525
W8ELW.....	17	250	225	25	517
W3QJ.....	6	254	210	44	514
W3WV.....	45	280	167	45	507
W0QXO.....	9	246	190	56	501
Late Reports:					
K6FCZ (Sept.)	37	513	499	14	1063
W4PFC (Sept.)	40	350	345	5	740

### More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
KG6FAA.....	256	2112	2062	50	4480
W6IAB.....	51	1545	1444	72	3082
KA2USA.....	67	1149	1199	31	2446
K0AIR.....	28	643	577	66	1314
K6FDG.....	70	615	542	54	1281
K4WAR.....	245	463	415	48	1171
K9FCA.....	111	525	380	34	1050
KA2AK.....	332	260	237	23	852
KA2GF.....	191	331	226	97	845
K4FDY.....	58	335	286	41	720
Late Reports:					
W3USA (July)	39	569	511	97	1216
W3USA (Aug.)	111	458	441	128	1138
W3USA (Sept.)	92	463	424	131	1110

### BPL for 100 or more originations-plus deliveries:

KA7SL.....	320	W4YRN.....	158	W3CYE.....	114
K2TBD/1.....	255	V06N.....	152	W0KQD.....	113
KASAB.....	239	W0WNA.....	150	VE3NO.....	113
KA21Q.....	202	VE3NG.....	150	W1BDI.....	103
W0FQF.....	181	W6KVB.....	146	Late Report:	
W6MLN.....	163	W0N1Y.....	117	K2FAV (Sept.)	321

### More-Than-One-Operator Stations

W1AW.....	129	K4WBP.....	103
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BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs up to and including September traffic: W2BO, W2JOA, W2JXN, W2KEB, W2KFF, W3CTH, W3CYE, W3WIC, W6LEQ, W6LYG, W6PHF, W6MIA, W6WNA, W6FIS, W7BA, W7PCY, W8RJC, W9CXY, W9DO, W9UJ, W9NZZ, W9VIZ, W0BDR, W0BLI, W0CP1, W0GAR, W0SCA, V06N.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCNs a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies, within 48 hours of receipt, in standard ARRL form.

## TRAFFIC TOPICS

What's in a name? Among the hundreds of nets registered in the ARRL Net Directory, some call themselves traffic nets and some emergency nets, but in actual practice the traffic nets frequently mobilize in an emergency, and the emergency nets usually handle traffic in their drills and test — and always during the real thing. A good general rule in that a traffic net should be an emergency net as well, and an emergency net should also be a traffic net. The designation as one or the other is to indicate the principal, not the only, dedication.

That the emergency net should know how to handle traffic (and that means *doing it* as a matter of course) is incontestable. This is not to say that they all do know how to

handle traffic, only that few people if anyone will argue that they *should*. We think that, generally speaking, emergency nets are better versed in the handling of traffic than traffic nets are in organization for emergencies. And that brings us, finally, to the subject for this column this month; that *every traffic net should have an emergency plan*.

Many already have. We can't mention them all, but more power to those traffic nets which have swung into action in emergencies, and even more power to those which have a plan for doing so. On the other hand, a good many of them handle only routine traffic and, in an emergency, find themselves on the outside looking in — looking for a place wherein they may be of assistance.

The National Traffic System has a policy for emergency operation which was set down in an Emergency and Traffic Bulletin dated Spring, 1950. Its salient points bear repeating. During an emergency, NTS nets should be self-activating; that is, they should be able to swing into action or take care of an emergency situation in any affected area. NTS nets in surrounding areas should be activated to take care of outside communications if and when called upon. Depending upon the urgency involved and the volume of emergency traffic, official or otherwise, the net manager concerned must determine whether his net in any particular situation shall handle official traffic only, all emergency traffic, or all traffic as usual. In most cases it will be possible to handle all types of traffic but to give precedence to official emergency traffic in view of its inherent public interest and importance.

The extent of NTS activation in emergencies will depend entirely on the extent of the emergency. If a local flood, the section traffic net will probably be adequate, with activation of the regional net, if required, to handle outside contact. If the emergency extends over several states or ARRL sections, probably the regional net should be activated in addition to section nets, with "shuttle liaison" from one to the other, and possible activation of the area net to provide outside contact. If the emergency is area-wide, all NTS nets within that area should be on the job, with possible activation of an adjacent area net to provide outside contact.

There is much more to this subject of using traffic nets for emergency purposes than can be discussed here and now. We simply wish to point out that it is not a new idea, and to renew the thought that traffic nets have an emergency application, and that ECs should know of traffic affiliations of any of their AREC members for possible use in emergencies. And you net managers — have you a plan for operation in emergencies? Better give it some thought.

— . . . —

Three miscellaneous October net reports: (1) The Early Bird Net reports traffic amounting to 686. (2) The North Texas — Oklahoma Section Net held 31 sessions, 1010 check-ins and a traffic count of 319. (3) The Transcontinental Phone Net registered 782 message counts with eleven stations participating in the First Area.

— . . . —

*National Traffic System.* NTS has a place for every traffic man if said traffic man has a place in his inclinations for NTS. The System is built on the basis of the "bestest for the mostest." Any amateur who really *wants* to participate may do so, and welcome. This includes old shellbacks who can copy 45 w.p.m. with a four-inch paint brush down to the newest Novice who had to hump to get past five w.p.m.

But this does not mean that you may participate at any level you please. NTS has many levels, and each participant must find his own — section novice or training nets for rank beginners, section traffic nets, regional nets, area nets and the Transcontinental Corps — depending on such factors as experience, dependability, and aptitude. We have been sniped at for this policy, but we still think it's a good one. The system was not set up to serve any individual or organization, but to serve amateur radio by creating an organized nationwide service.

Of course it does not always work as planned; even major leaguers never bat 1.000. If you are not participating, naturally you are hurting NTS, especially if you are one of the experienced traffic men we need to make it work. But we'll do what we can with what we have, and hope that the system will continue to show improvement through the years as traffic-handling amateurs learn that there is pleasure to be had in operating as part of a team.

An announcement: effective November 15, 1954, the ARRL National Traffic System officially adopted a six-day week. Many NTS nets already have been operating on Sat-

urdays and others expanded their schedules to cover Saturday at our suggestion. Some are finding it difficult to obtain Saturday NCSs and liaison stations (volunteers needed). Generally speaking, however, there will no longer be that crucial 48-hour period from Friday to Monday that NTS does not function.

#### October reports:

Net	Sessions	Traffic	Rate	Average	Representation
1RN	20	297	0.47	14.8	92.1%
3RN	16	193	0.70	12.1	97.9%
4RN	24	184	0.58	7.0	46.4%
RN6	42	275		6.5	
RN7	39	237		6.1	37.3%
8RN	32	165		5.1	76%
TEN	68	1826		26.8	58.6%
TRN	20	101	0.46	6.0	75%
EAN	21	813		38.7	95.2%
CAN	20	702		35.1	100%
PAN	23	526	0.56	22.8	89.1%
Sections*	377	2244		6.0	
Summary	702	7562	3RN	17.7	CAN
Record	766('52)	7562		17.7	
Late Reports:					
2RN (Aug.)	22	175	0.25	7.9	87.9%

\* Section Nets reporting: AENB & AENP (Ala.); MSN (Minn.); KYN (Ky.); CN (Conn.); Tenn. Hi Speed & Tenn. Sectional; WSN (Wash.); NEB (Nebr.); SCN (Calif.); WVN (W. Va.); QKS & QKS-SS (Kans.); TLCN (Iowa).

Connecticut, New Hampshire and Western Mass. get stars for perfect attendance on the 1RN report. 3RN started operating a session at 1830, starting November 15. W4OGG has taken the reins as manager of RN5, and VE7ASR is the new manager of RN7; we wish them both the best success. W8DSX says the second session of 8RN is not very well attended. VE3GI commends VE3AJR for her performance on TRN. W8SCW says he is still trying to get out an EAN bulletin. CAN certificates have been issued to W5CAF, W5MXQ and W4TYU; Peggy is having trouble getting NCSs for CAN. If interested, drop her a line or radiogram. A PAN certificate has been issued to W6ZRJ; W7NH is back at the helm of PAN.

The TCC roster is gradually filling up, but some of the long haul schedules are having difficulty with conditions so screwy. What we ought to have are midwestern relays to stand in on the schedules. Anyone want to be considered for that role once or twice per week?

## W1AW OPERATING SCHEDULE

(All times given are Eastern Standard Time)

The W1AW Fall-Winter operating schedule remains in effect. Master schedules showing complete W1AW operation in EST, CST or PST will be sent to anyone on request.

#### Operating Hours:

Monday through Friday: 1500-0300 (following day).

Saturday: 1900-0230 (Sunday). Sunday: 1500-2230.

Exceptions: W1AW will not observe its regular hours from 0300 Jan. 1st to 1500 Jan. 2nd and from 2230 Feb. 21st to 1500 Feb. 23rd.

General Operation: Refer to page 70, September QST, for a chart to determine times during which W1AW engages in general operation on various frequencies, 'phone and c.w. This schedule is still in effect but is not reproduced herewith for space considerations. Note that since the schedule is organized in EST, certain morning operating periods may fall on the evening of the previous day in western time zones. W1AW will participate in all official ARRL operating activities, using scheduled general operating periods for this purpose if necessary.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules:

#### Frequencies (kc.):

C.w.: 1885, 3555, 7125, 14,100, 21,020, 52,000, 145,600.

'Phone: 1885, 3950, 7255, 14,280, 21,350, 52,000, 145,600.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibration purposes.

#### Times:

Sunday through Friday: 2000 by c.w., 2100 by 'phone.

Monday through Saturday: 2330 by 'phone, 2400 by c.w.

Code Proficiency Program: Practice transmissions are made on the above listed c.w. frequencies, starting at 2130 daily. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately ten minutes of practice is given at each speed. Code-practice transmissions will be replaced by Code Proficiency Qualifying Runs on January 14th and February 14th, and by a Frequency Measuring Test on February 8th.

## BRIEF

Ray Grob, jr., W8YFJ, President of Sandusky Valley Amateur Radio Club, reports that a Mobile Caravan held July 18th, sponsored jointly by the Toledo Radio Club, Toledo Mobile Radio Club and SVARC, was a big success. A caravan of 160-meter mobiles started out from Toledo on a tour through the SVARC area, including Port Clinton, Fremont, and Woodville, Ohio. At their home stations the members of SVARC formed a net and worked the mobiles one by one as they passed through the area. In this manner the Toledo boys qualified for the SVARC honorary membership award by working five or more members, and the SVARC gang qualified for the WTO award by working fifteen Toledo stations. QRM was non-existent due to strict maintenance of net discipline.

## DXCC NOTE

Effective November 1, 1954, French India, FN8, has been deleted from the Countries List, since on that date it became a part of India. All confirmations of FN8 contacts prior to November 1, 1954 will be credited for DXCC, but confirmations of contacts after November 1st will be credited as India.

## DX CENTURY CLUB AWARDS

### HONOR ROLL

W1FH	252	G2PL	247	W6SN	242
W8HGW	251	W3GHD	244	W2AGW	241
W6YFR	250	W2BXA	243	W4BPD	241
W9YXO	250	W3JTC	242	W6SYG	241
W6AM	249	W3KT	242	G6RH	241
W3BES	248	W6MEK	242	G6ZO	241
W6ENV	247			PY2CK	241

### RADIOTELEPHONE

PY2CK	235	XE1AC	215	W1JCX	213
W1FH	224	W1MCW	214	W1NWO	212
VQ4ERR	222	W8HGW	214	W9RBL	210
Z86BW	219			SM5KFL	207

From October 15 to November 15, 1954, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

### NEW MEMBERS

W6PCS	166	PA6HP	121	W5OFM	104
W8LKE	148	W4NBV	116	G3WCP	102
W1AWE	125	G13DQE	116	SM3AKW	101
		G2BYN	107		

### RADIOTELEPHONE

CP5EK	136	11BJC	121	W4NBV	107
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### ENDORSEMENTS

PA6UN	240	CN8MM	180	W8TMA	121
KY4AA	230	W6A1H	170	W1APU	120
W9FID	222	W4HVQ	161	W9DGA	120
VK2ACX	212	W5BNO	160	W8NLY	120
W9NLM	210	W4ML	140	W5LCI	119
W6MHB	200	W6DGH	132	PA8TAU	117
G3FNN	200	W7KX	130	E3CK	112
CP5EK	183	W6FNN	130	W1EIO	110
PY1HX	183	V03X	130	W2ZGB	110
W7AH	182	VY5BZ	130	W91HN	110
		W21JU	124		

### RADIOTELEPHONE

W8GZ	190	PY2AHS	162	W8ZOK	122
G3FNN	175	11CAR	151	11CTE	121

### CALL AREA LEADERS

W5M18	239	W7AMX	238	VE4RO	222
		W9NDA	240		

### RADIOTELEPHONE

W2APU	202	W5BGP	203	W7HIA	175
W3JN	203	W6AM	196	W9ATV	162
W4HA	175			VE3KF	163

## CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on January 14th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,020, 52,000 and 145,600 kc. The next qualifying run from W6OWP only will be transmitted on January 7th at 2100 PST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions will be made from W1AW each evening at 2130 EST. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes the order of words in each line of *QST* text sometimes is reversed. To get sending practice, hook up your own key and buzzer and attempt to send in step with W1AW.

*Date* Subject of Practice Text from November *QST*  
Jan. 3rd: *A Multiband S13 Final*, p. 11  
Jan. 6th: *The Lazy Man's Panoramic Adapter*, p. 14  
Jan. 11th: *A Public Relations Project*, p. 18  
Jan. 13th: *Audio for the Mobile or Fixed Station* . . . , p. 21  
Jan. 19th: *An R.F. Bridge* . . . , p. 29  
Jan. 21st: *Simplified "Break-In with One Antenna,"* p. 30  
Jan. 24th: *The CD-10-TC*, p. 32  
Jan. 27th: *Fulminatin's from Ol' Fogey*, p. 34

## SUPPLEMENT TO NET DIRECTORY

The following list will supplement and correct the listing on page 78, November *QST*. Please inform us promptly of any errors or omissions so that they can be included in the March *QST* installment. An asterisk (\*) indicates correction from previous listing in November *QST*. This listing brings the record up to date as far as November 17, 1954. Registrations received later than this date will appear in the March *QST* supplement.

<i>Name of Net</i>	<i>Freq.</i>	<i>Time</i>	<i>Days</i>
Albert Net (Conn.)	29,460 145,200 52,420	1945 EST	2/Mon., Fri.
Alberta Phone Net (APN)	3765	1930 MST	Mon., Wed. Fri.
American Legion Amateur Net	3975	1900 PST	Daily
Anthracite Net (AN)	3610	1900 EST	Mon.-Fri.
Amateur Radio & Coffee Society (ARCS)	29,400	Always	Daily
Arizona CW Net (AZN)	3690	2000 MST	Tue., Thu.
Arizona Emerg. Net (AEN)	3865	1900 MST	Tue.-Thu.
AREC Net (Calif.)	3900	1030 PST	Sun.
Atlanta Forty CW Net	7150	2100 EST	Sun.
Atlanta Ten Phone Net	29,600	2200 EST	Sun.
Azalea Emerg. Net (Ala.)	29,680	2000 CST	Mon.
Badger Emerg. Net (Wis.)	3950	1800 CST	Daily
Bakersfield & E. Kern Co. (Calif.) Emerg. Net	145,440	1900 PST	Mon.
Barn Yard Net, The	3960	0700 EST	Mon.-Sat.
Baroyard Net	3924	0700 EST	Mon.-Sat.
Batavia Amateur Radio Assn. Net (N. Y.)	3565	2030 EST	Wed.
Bedford (Mass.) Club CW Net*	3600	1815 EST	Thu.
Bergen Co. (N. J.) CD Net	29,510 29,550	1945 EST	Wed.
Berks Civil Defense Net (Pa.)	145,400	2000 EST	Mon.
Bloomfield (N. J.) Communications Group	29,520	1100 EST	Sun.
Blue Ridge 160 Meter Net	1800	0830 CST	Sun.
British Columbia AREC Net (BCAREC)	3755	1800 PST	Mon.-Sat.
Brooklyn (N. Y.) AREC	3700	1100 EST	Sun.
Buckeye Net (Ohio) (BN)	3580	1900 EST	Mon.-Sat.
Catalpa Amateur Radio Society Net	3970 29,610	1000 EST 0900 EST	Sun. Sun.
Centinella Valley AREC	28,680 147,120	1930 PST	Tue.
Central Area Net (CAN)	3670	2030 CST	Mon.-Fri.
Central Gulf Coast Hurricane Net	3935	1815 CST	Daily
Central Illinois Net	1815	0830 CST	Sun.
Central Virginia Amateur Radio Club CW Net	3650	1945 EST	Mon.-Fri.
Charlotte CD Net (N. C.)	3825	0900 EST	Sun.
Colo. Emerg. Phone Net	3980	0830 MST	Sun.
		1700 MST	Tue., Thu.
Colo. Slow Speed Net	3570	1715 MST	Mon., Wed., Fri.
Columbia Amateur Radio Pool (Fla.)	7183	0630 EST	Mon.
Commanche County (Okla.) AREC Net (CCEN)	3860	1230 CST	Sun.
Conn. Nutmeg Net (CN)	3640	1845 EST	Mon.-Sat.
Coastal Emerg. Radio Net	146,800	2000 CST	Tue.
Cranston (R. I.) Civil Emerg. Net	39,510	2000 EST	Alt. Thu.
Davidson Co. (Tenn.) 2 Meter Emerg. Net	145,200	2000 CST 1930 CST	Mon. Thu.
Delaware Lehigh Amateur RC Net (Pa.)	29,640	1000 EST	Sun.
Dixie Traffic Net	3970	0800 CST	Mon.-Fri.
Duluth Emerg. Net	29,600	2130 CST	Tue.
Dutchess Co. (N. Y.) 2 Meter CD Net	145,350	2100 EST	Mon.
East Able Fox (EAF)	3915	2030 EST	Sun.
East Able Baker (EAB)	3503	2030 EST	Sun.
East Tennessee Net	3980	0845 CST	Mon.-Fri.
Eastern Area Net (EAN)	3670	2030 EST	Mon.-Fri.
Eastern Mass. Net (EMN)*	3660	1300 EST 1900 EST	Mon.-Fri.
Eglin Amateur Radio Society's Hurricane and Incidental Radio Net	29,560	1900 CST	Mon.
Eight Ball Net, The (Ohio)	1895	1000 EST	Sun.
Elbow Benders Net	1806	2100 EST	Tue.
Fall River Emerg. Net (FREN) (Mass.)	29,200	1900 EST	Wed.
Falmouth (Mass.) Emerg. Net	3585	1415 EST	Wed.
Fifth Regional Net (RN5)	3645	1945 CST 2130 CST	Mon.-Sat.
First Regional Net (IRN)	3605	1915 EST	Mon.-Fri.
Fish Net	3740	1930 CST	Thu.
Florida Phone Traffic Net (FPTN)	3945	0700 EST	Mon.-Fri.
Forest Hill (Ont.) Amateur Radio Club	3765	1900 EST	Sun.
Garfield Co. (Okla.) Emerg. Net	3825	0900 CST	Sun.
Gator Net (GN) (Fla.)	7105	1005 EST 1835 EST	Sun. Tue.
Gem Net (Idaho)	3638	2030 MST	Mon., Wed., Fri.
General Coverage	3990	1400 EST	Sun.
Georgia Cracker Net	3995	0930 EST 1830 EST	Sun. Tue.-Thu.
Golden Empire Emerg. Net (GEEN)	1920	2000 PST	Mon.
Grand Rapids (Mich.) Emerg. Net	29,610	2030 EST	Mon.
Green Bay (Wis.) Emerg. Net	3950 29,620	0730 CST 1300 CST	Sun. Mon.
Gulf Emerg. Mobile Net (GEM) (Miss.)	29,600	1900 CST	Thu.
Hair Net	29,560	1900 CST	Mon.
Hillsborough Co. (N. H.) Emerg. Net	29,000	1900 EST	Fri.
Hi Noon Net (Colo.)	3945	1200 MST	Mon.-Fri.
High Noon Net, The (Mich.)	3663	1200 EST	Mon.-Fri.
Holbrook CD Net	28,570	1900 EST	Mon.
Illinois Emerg. Net (IEN)	3940	1800 CST 0900 CST	Tue., Thu. Sun.
Indiana CW Net (QIN)	3656	1600 CST 1830 CST 2200 CST	Mon.-Sat.
Iowa 160 Meter Net	1815	1900 CST	Daily
Iowa Tall Corn Net (TLCN)	3560	1830 CST	Mon.-Fri.
Kansas 75 Meter Phone Net	3920	1230 CST	Tue., Wed., Fri.
		0800 CST	Sun.

Kennebec Emerg. & Traffic Net	29,460	2130 EST	Sun.	Prep School Net, The Province of Quebec Net (PQN)	3950	1400 EST	Wed.
Kent Emergency Group	145,160	2000 EST	Mon.	Puerto Rico Amateur Emerg. Net	3670	1915 EST	Daily
Kentucky Korn Krackers	3945	0700 CST	Daily		3559	2000 AST	Mon.
Kentucky Phone Net	3945	1830 CST	Mon.-Fri.		3925	2000 AST	Wed.
Knights and Ladies of Round-table Net (KLR)	3885	0830 CST	Mon.-Sat.	Quarter Century Wireless Assn. Net	3810	1100 EST	Sun.
Knights of the Kilocycles	3910	0730 EST	Sun.	Restricted Speed Net (Ont.)	3645	1330 EST	Sun.
Lucas Co. (Ohio) Emerg. Net	29,200	1030 EST	Sat.	Rhode Island Novice Net (RINN)	3743	1830 EST	Mon.-Fri.
"MAK" Chap. 2 (Mass.)	29,240	1900 EST	Tue.	Rhode Island Traffic Net (RIN)	3540	1900 EST	Mon.-Fri.
Malden (Mass.) Emerg. Net	29,540	1930 EST	Mon.	Rockland Co. (N. Y.) CD Net	147,210	1930 EST	Mon.
Manitoba CW Net (MAN)	3700	1900 CST	Daily	Sask. ARRL Phone Net	3780	1830 MST	Daily
Manitoba Phone Net	3760	1900 CST	Daily	Sea Gull Net (Me.)	3960	1700 EST	Mon.-Fri.
MARC Net (Ind.)	29,620	1900 CST	Mon., Wed., Fri.	Second Regional Net (2RN)	3690	1830 EST	Mon.-Fri.
Maryland Delaware DC Section Net	3650	1930 EST	Mon.-Fri.	Seventh Regional Net (RN7)	1988	1945 PST	Mon.-Sat.
Maryland Emerg. Phone Net	3820	1830 EST	Mon., Wed., Fri.		3575	2130 PST	Thu., Sat.
		1300 EST	Sat., Sun.	Sheridan Emerg. Net (SEN) (Wyo.)	3825	1930 MST	Tue.
Merced Co. (Calif.) Emerg. Net	3995	1900 PST	Sun.	6 Meter Emergency (Tenn.)	50,700	1900 EST	Tue., Fri.
Merocr (N. J.) Emerg. Net (MEN)	147,150	2100 EST	Sun.	Sixth Regional Net (RN6)	3615	1945 PST	Mon.-Fri.
Mich. Buzzards Roost Net	3930	1730 EST	Mon.-Fri.			2130 PST	
Michigan Emerg. Net	3930	0900 EST	Sun.	St. Paul Civil Defense Net (Minn.)	29,520	1930 CST	Fri.-Wed.
Milton (Mass.) Emerg. Net	146,808	1930 EST	Mon.	South Bend Mobiles	29,493	1930 CST	Mon., Wed., Fri.
Minn. Section Net (MSN)	3595	1830 CST	Mon.-Sat.				
Mo. Amateur Radio Teen Age Net	3830	0700 CST	Sun., Tue., Thu.	South Carolina Net (CW) (SCN)	3525	1900 EST	Mon.-Fri.
		1645 CST		So. Dak. 160 Meter Phone Net	1905	0800 CST	Daily
Monmouth Co. (N. J.) Emerg. Net	147,150	2130 EST	Mon.	Southern Calif. Net (SCN)*	3600	1930 PST	Mon.-Fri.
Morning Conn. Net (MCN)	3640	0630 EST	Mon.-Fri.			2030 PST	Mon.-Sat.
Nassau Co. (N. Y.) 10 Meter Net	28,720	2000 EST	Thu.	Sunrise Radio Club Net (N. Y.)	3950	1000 PST	Sun.
Nebraska CW Net	28,680			Tar Heel Net	3865	1930 EST	Mon.-Fri.
Nebr. Slow Speed Net (NSS)	3525	1845 CST	Daily	Teenage Net (TAN)*	3630	2315 EST	Daily
New Hampshire Emergency Net (NHEN)	3750	1700 CST	Daily	Teen Age Rag Chewers Net	3525	1700 EST	Mon.-Fri.
New Hampshire Slow Speed Net	3685	1730 EST	Mon.-Fri.	Tennessee HI SPEED Net	3635	1830 CST	Mon.-Sat.
New Jersey Civil Defense Net	3993	0930 EST	Sun.	Tennessee Phone Net (TPN)	3980	1245 CST	Mon.-Sat.
New Hampshire CW Traffic Net	3655	1800 EST	Mon.-Fri.			1830 CST	Tue., Thu.
N. J. 75 Meter Emerg. Phone Net	3900	0900 EST	Sun.	Tenn. Regular	3635	1900 CST	Mon.-Sat.
New Jersey Net (NJN)	3695	1900 EST	Mon.-Sat.	Tenth Regional Net (TEN)	3545	1945 CST	Mon.-Sat.
New Mexico Breakfast Club	3838	0700 MST	Daily			2130 CST	
New Mexico CW Net	3633	1900 MST	Mon.-Fri.	Thirteenth Regional Net (TRN)	3675	1945 EST	Mon.-Fri.
N. M. 75 Meter Emerg. Phone Net	3838	0730 MST	Sun.			2130 EST	
Newport (R. I.) Emerg. Net	28,900	1000 EST	Sun.	Topeka Emerg. Ten Meter Net	29,500	0930 CST	Sun.
N. Y. State Phone Emerg. & Traffic Net	3925	1800 EST	Daily	Toronto Ten Meter Net	28,250	0930 EST	Sun.
				Traffic Exchange Net (TXN)	7165	1900 CST	Daily
Night Owl Net (N. J.)	29,000	2300 EST	Sat.	Tropical Phone Tfc Net (TPTN) (Fla.)	3945	1800 EST	Daily
Nine Jacks and Queen Net	3870	1210 CST	Mon.-Sat.	Trans Continental Relay Net	7042	0215 GMT	Daily
Ninth Regional Net (9RN)	3640	1700 CST	Mon.-Sat.			0615 GMT	
		1945 CST		Tri Town Radio Amateur Club	3860	1900 CST	Wed.
Northampton Co. (Pa.) CD Net	29,640	1000 EST	Sun.			0900 CST	
North Central Phone Net (NCN)	3915	0700 CST	Mon.-Sat.	Tulsa Co. (Okla.) Teenagers Net	3735	1900 CST	Mon.-Fri.
North Fork Net (Okla.)	3815	1215 CST	Mon.-Sat.		3883	1200 CST	Sat.
Northland Net (Que.)	3680	1915 CST	Mon.	Tuboro Radio Club L. I. N. Y.	29,520	1900 EST	Tue.
	3775	1915 EST	Wed.			1130 EST	Sun.
North Texas CW Net (NTN)	3770	1900 CST	Mon.-Fri.	Union County AREC Net	145,940	2000 EST	Tue.
N. Texas-Okla. Net (NTO)	3960	1730 CST	Daily	Upper Peninsula Net	3950	1000 EST	Sun.
Northwest Texas Emerg. Net	3950	0800 CST	Sun.	Virginia Fone Net (VFN)	3835	1900 EST	Daily
NYC-LI CW Traffic Net (NLI)	3630	1930 EST	Mon.-Fri.	Virginia Slow Net (VSN)*	3680	1830 EST	Mon.-Fri.
		1900 EST	Sat.	Waltham (Mass.) CD Net*	145,800	2100 EST	Mon.
Oak Ridge (Tenn.) Emerg. Net	50,700	1900 EST	Tue., Fri.	Wash. Section Net (WSN)*	1988	1900 PST	Mon.-Fri.
Ohio Emerg. Net	3860	1800 EST	Thu.		3575	1900 PST	Mon.-Fri.
Okla. CW Net (OLZ)	3682.5	1900 CST	Mon.-Sat.			1930 PST	
Okla. Phone Emerg. Net (OPEN)	3860	0800 CST	Sun.	Weakley Co. (Tenn.) Civil Defense Net	50,353	2130 CST	Mon.
160 Meter Screwball Net	1992	1230 CST	Mon.-Sat.	Wellesley D. D. Net (Mass.)	147,250	0900 EST	Sun.
Ontario Civil Defense Net	3765	1900 EST	Tue., Thu., Sat.	Western Mass. Net (WMN)	3560	1900 EST	Mon.-Fri.
			Sat.	Western Penna. ORS Net	3585	1900 EST	Mon.-Fri.
Ontario Forty Meter Net (QON)	7160	1930 EST	Daily	Westlake Net (Ohio)	3950	1000 EST	Sun.
Oregon Emerg. Net	3840	1800 PST	Daily	West Park Radio Ops Emerg. Net (Ohio)	29,520	2200 EST	Mon.
		1900 PST					
Oregon State Net (OSN)	3585	1830 PST	Mon.-Fri.	West Virginia CW Net	3570	1900 EST	Mon.-Fri.
Ottawa Six Meter Emerg. Net	50,400	2100 EST	Tue.	Whittier Emerg. Net (Calif.)	3885	2015 PST	Thu.
OX Net (Me.)	29,500	2000 EST	Daily		29,520	1900 PST	Thu.
Pacific Area Net (PAN)	3670	2030 PST	Mon.-Sat.		145,250	1930 PST	Thu.
Penna. Fone Net (PFN)	3850	1830 EST	Mon.-Fri.	Wisconsin CW Traffic Net (WIN)*	3625	1800 CST	Daily
Pensacola Emerg. Net	29,560	1900 CST	Mon.	Wisconsin Phone Net	3950	1215 CST	Mon.-Sat.
Polecat Net (Pa.)	3665	1130 EST	Sun.			0930 CST	Sun.
Potomac-Rappahannock Valley Net (PRVN)	3935	0900 EST	1/3 Sun.	Worcester (Mass.) Civil Defense Phone Net	28,720	1930 EST	Mon.



• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

## ATLANTIC DIVISION

**EASTERN PENNSYLVANIA** — SCM, W. H. Wiand, W3BIP — SEC, IGW, RM; AXA, PAM; PYF, E.Pa. Nets: 3610, 3850 kc. A new radio club was formed by the amateurs of Tamaqua with meetings held the 2nd and 4th Mon. of each month. The new group has applied for ARRL affiliation under the name of Tamaqua Amateur Radio Club. The organizing officers are RZV, pres.; PTM, vice-pres.; WN3ZRQ, secy.; WN3ZPW, act. mgr.; KJJ chairman, emergency committee. The club publishes a monthly bulletin known as the *Sardine Wrapper*. New officers serving the DX Club for another year are VSS, pres.; PQB, act. mgr.; SDE, secy.-treas. The West Philadelphia ARA offers code and theory classes every Tue. with Novice examinations given every month. Hurricane Hazel found the club station, MKA, fully staffed with OWK, VCE, VCY, RKP, and WN3ZFC at the operating positions. PYF, manager of the PFN, reports a total of 121 stations reported into the net on Hurricane Hazel night with the FCC declaring the net frequency a clear channel emergency frequency. With the aid of the reporting stations, PFN was able to track Hazel at least one-half hour ahead of the weather bureau notifications, PDJ, secy. of the Abington Township ARA now stationed in Baltimore and reporting for other members of ATARA also with Uncle Sam, says RFI is operating 20-meter mobile while stationed at the White Sands Proving Grounds, N. M., and RCE skeds RFI from his QTH in Warrington. OQG is operating 10-meter mobile while stationed at Ft. Devens, Mass. WN3ZUB, YL and sister of PDJ, operates portable from Bucknell University where she's a junior. NQT is back home again at Mountain Top near Wilkes Barre and can be found wherever there is traffic to be handled. Traffic men will be interested to know that NQT was the operator at K4USA signing Hank. Welcome to the E.Pa. Net, Hank. JNQ reports losing all his antennas but one during the big blow. Traffic: (Oct.) W3CUL 4030, PYF 95, NOK 94, AXA 68, BFF 58, GES 56, RXW 52, UOE 51, OZV 50, DUI 46, NQT 46, TEJ 32, MWL 27, OK 26, QLZ 18, YJM 18, PVP 12, JNQ 9, GIY 6, VXQ 6, VPY 5, YGX 3, (Sept.) W3NQT 54, MWL 43, ABT 5, YHX 4, CHU 3, KFK 2.

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA** — SCM, Arthur W. Plummer, W3EQK — SEC, PRL. The MDD Section Net operates each of the five week days on 3650 kc. at 7:30 P.M. EST. The NCS is WV. The MEPN operates each Mon., Wed., and Fri. at 6:30 P.M. EST and Sat. and Sun. at 1:00 P.M. EST on 3820 kc. The NCM is FDK. The MMRC meets at 9:00 P.M. EST the 1st and 3rd Fri. of each month on 29,560 kc. mobile. The NCS is QLG. QQS now has a new folded dipole antenna. WV appears to be about the most active c.w. man in the section. HC took part in the 2nd Army "Tobacco Leaf IV" activity. TGF calls into MDD and 3RN occasionally. PRT has organized the Lafayette Amateur Radio Club with 17 members. ECP reports that the prize purchase at the recent Falls Church, Va., club auction was a 60-ft. triangular tower by a WN4 for \$1.00. The catch is he has to remove it from the seller's QTH! CDQ attended the Roanoke Division Convention in Richmond Oct. 30th. She reports a visit from Ada, ØRNO, Oct. 3rd. NPQ assisted several WN4s in getting their tickets. TKE won an NC-98 receiver, a BC-906 frequency meter, and a Heathkit grid-dip meter kit. ONB is now the proud possessor of a mill. EEB made a contact recently on 160 meters with his new Viking, his first 160-meter QSO in 20 years. JZY reports he has buried several hundred feet of antenna wire for ground-plane radials at his place. GRF reports operating 4HQN in both the CD and World Wide DX Contests. PZW, jr. operator of WV, at present operates K17FAF. Maj. Frederick B. McIntosh, of the USAF, gave a very interesting talk Oct. 25th to the Chesapeake Amateur Radio Club on "The Effect of the Novice on Ham Radio."

A movie, "The Functions of the Air Research and Development Command" also was shown. Maj. McIntosh is a member of MARS and the Annapolis Radio Club. The MMRC elected VAG as pres. and NKY as secy.-treas. The first hidden transmitter hunt of the Maryland Mobile Radio Club was held Oct. 22nd with 13 mobiles competing. 2PAV stunned everyone by traveling 13 miles and finding 3YLL/3 in 35 minutes. WN3ZBV, secretary of the Woodrow Wilson High School, Washington, D. C., announces that JEP, located at the school, is in operation and ready for business. 1FTV, formerly of Massachusetts, now is 3ZBH. NSV is getting back on the air soon after a two-year layoff. WN3YVR is moving from a trailer to an apartment so he will have more room for a 40-meter antenna. He also is building a 36-ft. ketch in which he intends to circumnavigate the globe with plans for expeditions to remote islands in the South Pacific. WN3YVS is building a Viking Ranger. Hurricane Hazel took down all of EQK's antenna. "Hazel" also took down HWZ's antennas and bent an element on JLY's beam. AVL was flooded out of his country QTH at Hollywood, Md., and HL, at Crisfield, was off the air for a week. JZY lost his antennas up in the hills near Smithburg. Communications for the Mummies Parade in Hagerstown was furnished by 3EHA, 8GPD, 3NZT, OYX, WTO, WWM, and VAM of the Antietam Radio Association. OXL, TJV, and RAH attended the Roanoke Division Convention. MFJ is back after doing some mobiling on 75 meters in Wisconsin and Nebraska. QLF gave a most interesting talk at the first November meeting of the Chesapeake Club on the construction of 10-meter direction finders for transmitter hunts. WKB now has a new 44-ft. vertical for 40 and 20 meters. Your SCM is now an official member of ARRL's Old Timers Club. The Andrews Electronics Assn. is conducting code classes for Novices 5 nights each week. Traffic: (Oct.) W3WV 507, CVE 251, RV 178, COK 131, UE 40, ECP 30, PKC 16, NNX 12, HC 10, WKB 9, (Sept.) W3USA 1110, COK 86, UE 79, ONB 63, RV 55, JZY 35, ECP 30, EQK 5, WKB 2, TGF 1. (Aug.) W3USA 1138, (July) W3USA 1216.

**SOUTHERN NEW JERSEY** — SCM, Herbert C. Brooks, K2BG — PAM; ZI. During Hurricane Hazel the South Jersey Radio Assn. demonstrated its ability to organize quickly and maintain communications on both 2 and 10 meters. Those participating were W2ABQ, K2AFJ, W2ASG, K2BWG, BZK, W3AOE/2, K2DWW, W2EGP, FTO, KN2GHY, KN2GYN, KN2JEI, W2JRO, LY, NFL, W3OEN/2, W2OQN, PAU, PEN, PTM, PZX, QBH, TBD, TXP, VX, YPQ, and YRW. The Burlington County Radio Club also did a swell job with EVR, GOK, JJV, WKI, WUP, and ZNB. NFL now is located in Merchantville. 3ESX's new QTH is Audubon. The JP Net promoted a transmitter hunt to stimulate activity on 10 meters. SDB is doing a good job keeping everyone posted on DX activities, especially the International DX Contest. K2JIG is a new member of this section. Woody is ex-3BOX and is located in Glassboro. KN2JJC and KN2HXD are interested in starting a Novice Net. If interested, please contact these fellows. ZVW is on 15 meters working DX in addition to his regular EAN assignment. SUG has received his MARS certificate. BAY is rebuilding all his antennas as a result of the hurricane damage. ASG also has repairs to make. ZI has returned from a Florida vacation; he worked mobile all the way. KN2JID is the dad of K2ART and K2DSL. K2CLD has dropped the "N" and is heard occasionally operating W2ZQ. The Hamilton Twp. Radio Assn. is planning to reactivate its Friday night mobile net. Traffic: W2RG 126, K2BG 66, W2ZI 14, SUG 12, ZVW 12.

**WESTERN NEW YORK** — SCM, Edward G. Graf, W2SJV — Asst. SCM; Jeanne Walker, 2BTE. SEC: UTH/ FRL. RM: RUF. PAMS: GSS. NAI. NYS meets on 3615 kc. at 6:30, and 3925 kc. at 7 P.M.; NYSS on 3595 kc. at 8 P.M.; NYS C.D. on 3509.5 and 3993 kc. at 9 A.M. Sun.; TCPN 2nd call area on 3970 kc. at 7 P.M.; SRPN on 3970 kc. at 10 A.M.; ISN on 3980 kc. at 3 P.M. The v.h.f. group of the RARA held a meeting at the QTH of UXP. K2CUR received a personalized, hand-made QSL card nearly 3 ft. square from 1BWB. EMW has the 50-watt rig on while getting the bugs out of the 813. Under the leadership of K2BEG, CUU, LXE, CYE, and K2s HUK and DVD provided mobile communications for the annual Sports Carnival Races held in Buffalo. RHQ worked 40 miles on the first try on 420 Mc. K2AAH/2 is working mobile to and from college. QBB is working DX on 40 meters running 500 watts to a pair of 813s. Receiver is a BC-312, antenna a 7-Mc. ½-wave Zepp up 25 feet. K2CEH is the most active ham on 220 Mc. in the Rochester Area. Also on are POM and RTB. ZYQ was elected prexy of the Utica ARC with SSL, vice-pres.; and QJH, secy.-treas.



A committee headed by QXA will handle Novice and Tech. Class exams. SSL, with the help of former 8KOD and WNK, is organizing c.d. KBT has resigned as manager of NYSS. OPD has been named as NYSS mgr. with BNC as asst. mgr. Hurricane Hazel removed UTH's 2- and 6-meter beams. FE is active in Frequency Measuring Tests and LO and CD Parties. Speakers at RAWNY meetings were TKO on RTTY, and R. Russell and C. Confers, of Bell Labs, on Meters and their Uses. NAI, Schoharie EC, reports that her group was activated for the S.E.T. QCO now is 4FSS in Florida. BGN was M.C. of the OT Nite sponsored by the RARA. ICE presented the RARA OT show, films, and displays at the New England Division Convention. GVJ has a new 20-meter beam. GBN dropped the "N." KN2s IJV, INP, and JBV are members of the Timon HS ARC. K2BU1 uses a Matchbox and VFO and is building a Heathkit VFO for his brother, IZNH/2. We regret to report the passing to Silent Keys of VZ. OLIH is on 80 meters with 45 watts, S-40B receiver and 75-ft. long-wire antenna; also on 7050 kc. KEL would be glad to have those who hear his Official Bulletins come back to him for repeats if desired. Hurricane Hazel took down RUT's antennas. There is much interest in the code classes conducted by K2GDI. CXM lost his antenna during Hurricane Hazel but is back on 20 meters with a kw. QQ visited VE3DJJ while vacationing. NYS is cooperating with NTS on a full-time schedule. Traffic: (Oct.) W2RUF 525, QHH 171, K2DXV 125, W2BNC 108, HKA 96, K2DSR 84, W2ZRC 65, OE 50, K2BU1 36, DJN 30, W2DSS 29, CXM 22, EMW 14, SJV 13, GBX 9, K2CUQ 6. (Sept.) K2FAV 393, DJN 14, W2RQF 11, OPD 10, DVE 5. (Aug.) K2DJN 9.

**WESTERN PENNSYLVANIA**—SCM, R. M. Heck, W3NCD—SEC: GEG. RMs: UHN, NUG, GEG. PAMs: LXE and AER. The WPA Traffic Net meets at 7:30 p.m. on 3585 kc. Newly-organized is the Radio Club of Indiana County with the following officers: VKD, pres.; OTN, vice-pres.; YUG, secy.; Cliff Porter, treas.; and WXX, act. mgr. Good luck, gang, and keep us informed as to your activities. LOD reports on the McKean County Radio Club activity. Those active in the S.E.T. there were SJV, LQQ, OCR, LPO, MEY, and WN3ZMF. The Club also is attempting to hold study in radio and code and has set up a committee to aid in mail-licensing needs there. The Radio Association of Erie still holds weekly classes in theory and code and is having a bumper attendance, with enrollment around 75. STK is chief instructor with NXX, VNB, and KNQ assisting. The RAE c.d. mobile units have been conducting tests to find the best spots for good coverage of the county and expect soon to cooperate in a c.d. test. A box social was held and enjoyed by all who attended. Fine lunches, movies, and music were the features. WSO is new General Class licensee in the area. A reliable source reports MMI and OIH taking to the air now with wings as well as by radio. Put both together and let us know how they come out. I also had the fine newspaper, *KWH*, here but am sorry to report that I seem to have mislaid it at this writing and will have to humbly ask the SCARC to please excuse my bad manners. However, I can report that the SCARC was host to the Western Pennsylvania Amateur Radio Club Council at its October meeting, when the following officers were elected: GEG, chairman; OVM, vice-chairman; KWL, secy.; and MTP, treas. Traffic: W3WUQ 1978, QPQ 206, LHM 154, YA 92, LQX 54, UHN 30, NCD 13, UTR 12, LXE 11, PWN 8, RVS 8, MIZ 6, KNQ 5.

## CENTRAL DIVISION

**ILLINOIS**—SCM, George T. Schreiber, W9YIX—Section nets: ILN (3515 kc.), IEN (3940 kc.). RMs: BUK, MRQ. PAM: UQT. Sec: HOA. Asst.: VTL. Cook County EC: HPG. 1VMIW, author of *How's D.A.*, again has returned to the section and is operating under his old call, 9BRD. More than 25 amateurs handled the communications for the Chicago civil defense authorities in a mass feeding experiment early in November, the first time hams were called on to do such work. Calls included HPG, FZI, GRW, ZRF, YWH, NPN, KIK, QAO, GPV, SES, BWN, YLB, ZCG, VSV, ZQG, QQS, KCW, PZP, PEN, HXI, IKZ, MCS, ZIH, GOB, and EGB. Possibly there were some others we have left out. JMG is a new OPS. New OPS appointees are AA and YBS. KJ has a kw. on the air which he claims is TVI proof. PBI again placed first in the September F.M.T., with ATV second and 6CIW/9 third. Incidentally 6CIW, who is a Naval Commander, has been ordered to Puerto Rico, 10th Naval District, as industrial manager. PTZ is stationed in Japan and is trying to get a 20-meter rig going to talk to his dad, STZ. The Southtown Net operates in the Chicago Area each Mon. at 7:30 p.m. with HPG as NCS, and on Tue. with GPV directing the western section. Frequency is 29,640 kc. VL is back on the air operating on 7 and 21 Mc. His former call was EWG. VTO has moved to Iowa. SEH, ACZ, and ZYE are the amateurs composing the license exam committee of the Twin City Radio Club. The Quarter Century Wireless Operators Assn. is putting on a drive for members. Chairman of the Illinois chapter is LZ, with WR, CYD, and EVA the other officers. REC, ex-SAUB, again is operating in Illinois and enjoyed the S.E.T. New Novice calls are JZK, KZA, and IXN. They are interested in forming a Novice traffic net. HUX

built a new relay rack out of a discarded day bed. Tech. The Starved Rock Radio Club makes it a practice to keep track of the membership in ARRL of club members and reminds them of expiration. The XYL of IDA is recovering from an operation. TLC is back on the air after recovering fire damage. DKW has completed a new station with Viking II and NC-183D. ZEN finished his boat in time to store it in the garage for the winter. RQY really has been busy at OO work. He sends in a list of 22 stations to whom friendly warnings were mailed. FLL and IOS enjoy 15 meters with great success. LI is working DX like mad with his new switchable vertical. His brother, GDI, also has a vertical that works, but neighbors have a pool on when it will bend double in the wind. YLU motored to Mexico City and secured a permit to operate as XE5PD. KWK is a new call in this area. Goodbye and luck to NXC, who is moving to California. As assistant radio editor for a Chicago paper Tony always had a good word to say for amateur radio in print. The committee for the '55 DXCC Convention is FID, QIV, FKC, and NN. The latter is trying to interest ex-BB in again getting a ham call. ATH and CKU are eying the multi-band vertical antenna. OAV, after three years of study, can now order a cup of coffee in Spanish. The strange frying noise in PEB's modulator has stopped, but so has the modulator. The fire department had a nice run to his home. KHJ is now on 20, and 10 meters is again peaceful. Traffic: (Oct.) W9D0 1338, KYFCA 1050, W9AA 124, YIX 81, QGG 74, HPG 67, OR 46, CEE 43, MRQ 41, SXL 30, W9NGMK 26, W6CIW/9 25, W9LXJ 21, STZ 16, REC 13, FRP 10, VTO 10. (Sept.) W9OR 32, LMC 13, HPG 8, FRP 4. (July) W9OR 49.

**INDIANA**—SCM, George H. Graue, W9BKJ—The Indiana Radio Club Council (IRCC) met at Indiana U., Bloomington, Oct. 24th. Officers elected were CMT, pres.; QBJ, vice-pres.; WTY, treas.; GRA, secy.; IHO, MBL, and JBQ, directors. ECs in Hammond, Plymouth, and Knox offered amateur radio assistance during the recent heavy rains. Mobile units of the Mobile Amateur Radio Club of South Bend, the Michiana Radio Club, and the Lake County Amateur Radio Club were in operation. The LCARC has 11 active 160-meter mobile units, and is setting a goal of 15 2-meter mobile units. WWT reports for RFN with a total traffic of 203; OLN, for QIN, reports a total of 446; NTA, for IFN, reports a total of 119. New in Evansville are N9KCU, KFE, KDJ, and KEP. Active in Princeton are URQ, ZZR, AYK, ZYV, N9JEP, IYR, IYX, and N4HUR/9. OVB has an 813 rig per Jan. QST. GPR has an all-band mobile. WEI is active on 20- and 40-meter c.w. or 'phone from Lake Lawrence. TGX is active at Vincennes on all bands with a B. & W. rig. RVM has 30 countries and 43 states on 15-meter 'phone. GZT is active on 80-meter s.a.b. GFS and UMS were mobile in Canada. DGA was elected president of TARS. The TARS transmitter hunt was won by NYX. The ham colony at Saint Meinrad Archabbey consists of NTR, WWF, ABW, UVJ, INT, AOO, N9INX, and 2GQW/9. ERB transmits Official Bulletins on 2, 6, 20, 40, and 80 meters. The IRC will have an amateur radio exhibit at the hobby show in Indianapolis. HXR received a 20-w.p.m. sticker. NZZ has 150 on his DXCC. SNT rebuilt for higher power. The Mike and Key Club of New Albany purchased 24 mobile and 2 base stations for the 2-meter F.M. Net. The Clarke Co. Radio Club has code and theory classes under way. LNA and ZVS are on 29-Mc. mobile. DFW is active on 80- and 40-meter c.w. EAO has a new modulator. TT is building a new shack in the basement. WRO is active on 75-meter 'phone. JKR is on with a complete Heathkit station. 80PZ now is 9PSJ in Muncie. CEA has a new antenna. KLR worked Virginia for his 21st state on 2 meters. Traffic: W9UJ 1524, NZZ 686, SNT 667, JBQ 466, TT 401, QYQ 213, UQP 168, UWU 100, STZ 81, VNV 49, WRO 44, EH2 40, NTA 31, CMT 30, SVL 30, YIP 26, CC 25, KDV 25, TG 25, YB 22, EQO 21, RPL 21, BKJ 16, DKR 16, FYM 14, DOK 12, WBA 12, ZIB 12, YVS 7, NHI 6, QR 6, DGA 4, CEA 3, NTR 3.

**WISCONSIN**—SCM, Reno W. Goetsch, W9RQM—SEC: OVO. PAMs: ESJ, GMY. RMs: IXA, RTP, UNJ. Nets: BEN, 3950 kc., 6 p.m. daily; WIN, 3625 kc., 6 p.m. daily; WPN, 3950 kc., 1215 Mon.-Sat., 0930 Sun. Mobile and c.d. frequency: 29,620 kc. VBZ received a BPL Medalion, and qualified for Traffic 12,000 Messages Club. ESJ has 4 states worked on 144 Mc. Net certificates (BEN) were issued to UTN, GTJ, WLW, and FFC. WWJ operates only week ends. OVO reports that there are 437 members and 187 mobiles officially registered in the Wisconsin AREC. SZR has 43 countries with FQS, CE6, TF, and EAS on new inverted "Y" Windom 100 feet high. UVA and RUB won the FLARC hidden transmitter hunt. RUB is building a two-element 20-meter beam. FFC is building a Viking II rig. LSK is E.E. student at M.U. New officers of the Point Radio Amateurs are CFW, pres.; DPN, vice-pres.; BCC, secy.; treas. CES and CFW have dropped the "N" from their calls. UIM is working on break-in for his station. UIT, after 5 years of almost 100 per cent daily transmissions of ARRL Bulletins, has decided to relinquish his OBS schedule. MRAC members participating in harbor accident communications were GPI and HIF fixed, and YFW, PD, SNK, and ONY, mobiles. UFX, Wisconsin RO, is getting the State RACES Net on an operational basis. MQK is Madison RO, while UGT is a new EC. HAT has TBS-50 and SX-43.

SQM's mobile has Gonset Super-6 and Stancor transmitter with Hy-C whip on 75 meters. MRAC mobiles CUW, TKY, MPF, VLK, ROH, and ONY took part in M.U. Homecoming Parade. The MSOE Club (HHX) has as new officers 0CEO, pres.; IBNA, vice-pres.; 6IM, secy.; 9AXY, treas.; VCH, trustee. ANX is interested in RTTY. After losing his S28, DYL is designing around a pair of S26s. Now at MSOE, 6IM has been licensed since 1923. Congrats to IXA on an FB issue of the WIN bulletin. IU operates from the WHKW site with a B. & W. 5100 and S-20 or 348-L, and Windom antenna 100 feet high. KKK has TBS-50 and S-20R with VHF-152A. LVB's new QTH is a "Ham's Paradise." Traffic: (Oct.) W9VBZ 843, ESJ 346, WJW 99, IXA 62, RPT 61, FXA 57, SAA 55, GMY 36, OVO 13, SZR 11, RQM 9, LSK 8, RUB 8, AEM 7, IBF 6, RKP 6, KWJ 4, FFC 2. (Sept.) W9KWJ 10.

## DAKOTA DIVISION

**NORTH DAKOTA**—SCM, Earl Kirkeby, W0HNV—RM: FVG. PAM: GZD. ORS: CAQ, EBA, KTZ. OBSs: KZZ, MXD. Sorry we had no news to report the last two months but, fellows, if you want our section to appear in this space every month let us know what you are doing. Thanks to the few who faithfully send in their traffic reports every month. I know most of you have been too busy this summer for ham radio but with winter here we expect renewed activity. Orchids to GZD for the fine job of rejuvenating the North Dakota 75-meter 'Phone Net, which meets on 3845 kc, at 6 p.m. every night except Sun. SHZ has dropped the "N" from his call. DAO now is at Condo, N. Dak. QOB is active at Devil's Lake and UXQ is stationed at Finley, N. Dak. Your SCM reports the arrival of YL operator No. 1 at his house Oct. 9th. Traffic: W9KTX 179, EXO 142, KLP 141, FVG 85, NPR 69, EBA 62, KZZ 8.

**SOUTH DAKOTA**—SCM, J. W. Sikorski, W0RRN—Asst. SCMs: Earl Shirley, 0YQR, and Martha Shirley, 0ZWL. SEC: GCP. RM: SMV. PAMs: BNA, PRL, NEO. DES received a Ranger for his birthday. BNA is NCS of the NJQ Net, with NEO as assistant, and GDE is NCS of the night 75-Net, with RMK as assistant. EYB, now General Class, has a new Globe Scout. The Mitchell ARC is conducting "Amateur Radio from Scratch" classes. GCP now has a Gonset converter in his Ford. October average attendance on the 75-Net was 37 per session. The C.W. Net reports a total QNI of 117 in 13 sessions, handling 46 messages. SMV is asking for more operators on the C.W. Net. BJH, NOT, and RRR attended 3 weeks' microwave school in Omaha. The 160-Net reports 436 QNI in 30 sessions. MJZ reports some of the Brookings gang are working on 420 Mc. Thanks to those who sent in reports. Traffic: (Oct.) W6SMV 61, GDE 52, MPQ 49, DVB 35, SCT 30, ZWL 26, NEO 17, GCP 12, BNA 9, O0Z 6, 0JQ 4, AYD 3, HOH 1, WUU 1. (Sept.) W0PRL 20, DVB 7.

**MINNESOTA**—SCM, Charles Bove, W0MXC—Asst. SCM: Vince Smythe, 0GGQ. SEC: GTX. RMs: DQL, OMC. PAMs: JIE, UCV. The St. Paul Radio Club, Inc., held an election of officers. Results were as follows: IHKF, pres.; THY, 1st vice-pres.; KWG, 2nd vice-pres.; PAK, secy.; and FGN, treas. HFY is planning on going on 2 meters. KLG is the new manager of the MSN C.W. Net. DQL has a new Viking. DQL, KLG, IFY, and TKX attended the Midwest Division Convention at Des Moines. KJZ is visiting 4ZDB and family. WQL is a new ham in Minneapolis. The Mankato Radio Club's station is now licensed with the call WCL. TOK now has his General Class license. OJH bought a new SX-71 from LUX. QKA is teaching code at the Mankato Vocational School. All beginners are requested to join the class on Thurs. nights. DJT is in the hospital and should be OK by the time you read this. BWF has purchased a 20-meter beam from LLL. The St. Paul Radio Club's emergency station, REA, has in its possession a bunch of new equipment. This includes four 2-meter Gonset Communicators, four Gonset Commanders which are 30-watt transmitters for all bands, 6 through 80 meters, and three 2-, 6-, 10-, and 11-meter receivers with 2 more on the way, together with various generators, mikes, antennas, etc. These boys really are serious about emergency work. QBW has been working DX since getting on 20 meters. TQQ is back home again after operating portable up near Ely all summer. KFN and EUI were mobiling in Florida. OVO is reactivating K0WAA at the National Guard Armory in Minneapolis. He will be using the big vertical tower on the 6th Ave. side. Traffic: W0WNA 289, KLG 213, KFN 127, KNR 91, UCV 69, IRJ 55, DQL 48, QNY 48, TKX 40, EHO 34, GTX 32, LST 30, LUX 30, PBI 25, KJZ 24, OJH 22, TJA 19, TUS 15, HKJ 14, GGQ 13, ABA 10, CID 10, RVO 10, ALW 9, MNC 8, BZG 6, DYC 6, GWU 6, GWJ 5, PUO 4, BUO 3, LIG 3, QDP 3, OPA 2.

## DELTA DIVISION

**ARKANSAS**—SCM, Owen G. Mahaffey, W5FMF—Hi, gang, here we go with our first report. First let us all thank our past SCM, Fred Ward, LUX, for the great job he did for us. The OHK Net meets at 7 p.m., on 3695 kc., Mon. through Fri. Meet you there. VQD paid us a visit. He is building a pi-network antenna tuner. CAF meets

RN5 and is doing an FB job. Send a report on what you are doing and what you want. Ham clubs should appoint a reporter to send me the dope on what you do, meeting nights, dates, etc., as I may drop in sometime.

**LOUISIANA**—SCM, Thomas J. Morgavi, W5FMO—PAM HEJ advises that an emergency 'phone net has been organized for the Monroe Area which meets on 1825 kc. at 0900 Sun. HEJ and IVF have CD appointments in Monroe. KRX is back on after working over his transmitter. ZSP lost his plate transformer but expects to get back on soon. In the meantime he is practicing on his Lampkin 105 for the next Frequency Measuring Test. GIX advises no 2-meter activity to the west but several contacts in Mississippi and Florida. The Istrouma ARC is sporting a panel truck with a BC-654, BC-669, a new PE201, 1-kw. a.c. generator, and a brand-new club call, HUD. ONM is its president. LV is MM on 15 meters. INL has a new Johnson Ranger on the air. IIA is an s.s.b. fanatic and is active on 75 meters. BUK is constructing a new bandswitching exciter. JCC has gone mobile. VND is back in town and on the air. UPM is operator on the SS *Dick Lykes* and is operating MM. SEC IUG reports the participation in the nationwide Simulated Emergency Test of Oct. 9-10 was very successful. Contact was maintained with 11 areas in Louisiana by the State Civil Defense Mobile Communications Control Center. Participating were LFF, DHE, UXG, KHJ, YCO, IHR, MWE, YNG, DKU, FM0, and SQB. NLK reports 26 hours transmitter operation time, 5 hours of which were spent sending 17 bulletins, 21 hours ragchewing, and no time testing. That last item should be noted and adhered to by all of us. Ex-SCM DKR is back and active on 40-meter c.w. His jr. operator, a Novice, is GRW. Traffic: (Oct.) W5NDV 91, EA 36, MXQ 31, HEJ 13, SQI 2. (Sept.) W5KRX 12, MWE 10, HEJ 8. (Aug.) W5KRX 74.

**MISSISSIPPI**—SCM, Dr. A. R. Cortese, W5OTD—We need some new ECs in various cities. Let's get Mississippi well lined up. Now for the news: TIR is now in Jackson. EPI has a new General Class license. CTY is now in Japan. That's all the news as received. Traffic: W5VME 201, EWE 73, TIR 56, KYC 34, JHS 33, CTY 28, OTD 4, BSE 2.

**TENNESSEE**—SCM, Harry C. Simpson, W4SCF—SEC: RRV. PAM: PFP. RM: WQW. PL still is vacationing in Texas. Weather reports now are being given by stations QNI Tennessee 'Phone Net. Information thus collected is being used by a Nashville TV station as a public service. FWX and CRP are opposing candidates as president of the Memphis Club. TPI's homecoming game fell on the same date as the S.E.T., so UWA/4 had many visitors. DZM, ZLT, APD, ZLZ, IAY, ZLK, WXL, ETJ, SGU, ZJY, PVD, and WJH visited and operated the 20-watt emergency rig set up by UWA, GUE, and KN4AAU. A new ham in So. Fulton, Tenn., is KN4AOK, just 11 years old. FLW reports 6- and 10-meter use during the S.E.T. BQC now is working Jackson, Memphis, and Marks, Miss., on 2 meters with sixteen-element rotary beam. A nice RN5 Bulletin was received from Mgr. OGG, who informs us that all NTS nets are now 6-day. WQW reports both c.w. nets are in full swing and invites more attendance. UWA reports fine attendance on the Upper Cumberland Net, with CTF missing no sessions. Roses to PVD and UWA for the fine UCN Bulletin. Thanks to the efforts of WQW, AEE, and others, the c.w. net was an integral part of the Tennessee Communications Alert and colors are flying! HHH is a new ORS. New ECs are RHK and BTS. RRV reports the section in fine shape on ECs with only a few counties open. Traffic: (Oct.) W4OGG 813, PFP 138, IIB 129, HHH 119, K4FET 113, W4BQG 110, WQW 103, UWA 100, OEZ 52, WAX 52, SCF 49, TZD 35, RRV 30, PQP 29, ODR 24, UVS 24, VJ 24, RET 17, YPG 14, WJ 13, IV 12, PNG 12, BAQ 11, FLW 10, PVD 10, COY 9, PAH 9, RMJ 8, TIE 5, WN4HSX 3, HUT 3, W4SGI 1. (Sept.) W4UZY 35, PQP 32, BBD 9, TUO 5.

## GREAT LAKES DIVISION

**KENTUCKY**—SCM, Robert E. Fields, W4SBI—Looks like JUI is our No. 1 station with an OO appointment. He is working on the 6- and 2-meter rig and already has receivers and standards for those bands. CDA has a very potent 'phone signal on 75 meters now, the first time on 'phone since he got his ticket in 1930. SYD says skip is causing him no end of trouble handling traffic on KYN. WN4GTC is asking for information about a Novice net on 30 meters. WNH has an 82-element beam up for 2 meters, but blew up a relay on the big rig, temporarily curtailing operation on 80 meters. K4FBW has completed a 6146 parallel final and is rebuilding an exciter. KKW is working the traffic nets, KYN, 9RN, and UTL, and getting his share of traffic. YZE is a new OBS appointee and is doing an FB job with Official Bulletins. The following stations make up the KYN C.W. Net: BAX, BAZ, BBU, BRI, CDA, K4FBW, FR, FGF, HFA, IAY, JBQ, JCN, JDU, JHU, JSH, KFA, KKG, KKL, KKW, KTA, LDL, LUR, LXA, MGT, MRT, MMY, MWX, NBY, NEP, NIZ, NVR, OEE, OGP, OXX, PRT, PXX, RAE, RHZ, RYL, SBI, SUD, SXP, SYD, SZL, TAV, TRQ, TQC, UVH, UWA, UYA, VBA, VKC, VYO, WAO, K4WBG, WHIC, WNF,

(Continued on page 82)



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**1955**



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W1BAQ.....	HERMAN S. BRADLEY.....	198
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W1BJJ.....	G. H. STAPLEFORD.....	580
W1CTW.....	CALVIN HADLOCK.....	510
W1CUD.....	ELLIOT RUTTENBERG.....	950
W1EXR.....	WILLIAM H. OSBORNE.....	198
W1EYZ.....	G. R. RINGLAND.....	540
W1GQQ.....	J. D. BASSETT.....	550
W1HOH.....	DAVID SMITH.....	511
W1HXY.....	JOSEPH ROSSI.....	522
W1IFM.....	JOHN S. BOYERS.....	530
W1JEL.....	EDMUND HARRINGTON.....	510
W1JOX.....	ROBERT L. WILLIAMS.....	630
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W1KXQ.....	VICTOR G. JARVIS.....	573
W1KPB.....	FRANK G. LOPEZ.....	635
W1LML.....	LEO A. GREEN.....	199
W1LNV.....	FRANK WADEN.....	811
W1MGP.....	SAMUEL H. BEVERAGE.....	198
W1MTS.....	VICTOR E. PENNEY.....	864
W1MWX.....	RALPH H. HEMEON.....	198
W1MXC.....	DONALD J. POULIN.....	522
W1MYH.....	DEXTER H. ATKINSON.....	864
W1NYU.....	MARTIN OXMAN.....	510
W1OCY.....	EVERETT CHAPMAN.....	510
W1OEX.....	RALPH HAWKINS.....	510
W1OOP.....	H. H. CROSS.....	510
W1PSJ.....	HYMAN KANA.....	573
W1QIU.....	RAYMOND G. JORDAN, JR.....	520
W1RYE.....	WILLIAM P. SULLIVAN.....	510
W1SYA.....	REDMOND G. SHEETS.....	198
W1TPB.....	TED N. SMITH.....	198
W1TV.....	WILLIAM S. DOYLE.....	522
W1ULB.....	FRANK SANTAGELO.....	511
W1VPO.....	BENJAMIN BALLARD.....	851
W1VXE.....	ROBERT L. SNOWMAN.....	198
W1WTS.....	DOMINIC DIMARCO.....	198
W2AQX.....	JACK E. WILLSON.....	813
K2HJF.....	A. EARLE FISHER.....	812
W3UFP.....	JOHN HEIM.....	66
KL7PDG.....	BOB MITCHELL.....	511

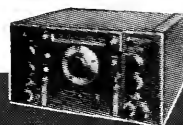
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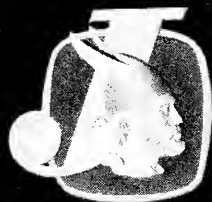
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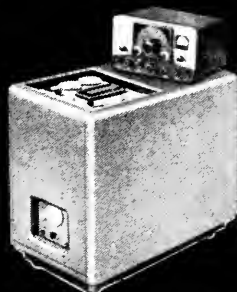
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A magnificent new kilowatt... unequalled in performance... luxurious in appearance! This boldly styled Viking Kilowatt is truly tomorrow's concept of electronic equipment design and operating convenience. Of course you'd guess it's built by Johnson, unquestioned leader in the amateur transmitter field.

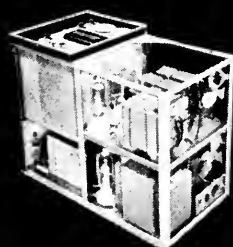
Operating the Viking Kilowatt is a never-to-be forgotten experience... you'll marvel at the ease of selecting SSB, AM, or CW with the flip of a single switch... you'll enjoy the convenience of its desk top controls... and you'll immediately sense the authority of its full kilowatt signal lifting you into a select group of leading amateurs... commanding the admiration of all. You'll be delighted, too, knowing that all this can be yours at an unbelievably low price. This Viking stands alone as a crowning achievement in all things that make a perfectly engineered kilowatt a pleasure to own and operate.

For more than just a look at the functional exterior beauty of the Viking Kilowatt, a deluxe brochure with the complete inside story may be yours on request. Write for your copy today.

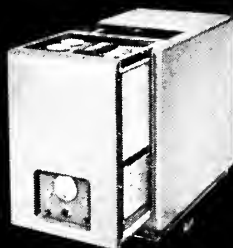
CONTINUOUS COVERAGE FROM 3.5 TO 30 MC. MAKES THE VIKING KILOWATT AN IDEAL CHOICE FOR COMMERCIAL APPLICATIONS, TOO.



This compact pedestal contains the complete Viking Kilowatt. Excitation requirements are 30 watts RF and 15 watts audio for AM and 10 watts peak for SSB. The Viking "Ranger" transmitter/exciter (shown above) is an ideal RF and audio driver for AM and CW, and the New Viking SSB transmitter/exciter, soon to be announced, will drive the Viking Kilowatt to full output on SSB.



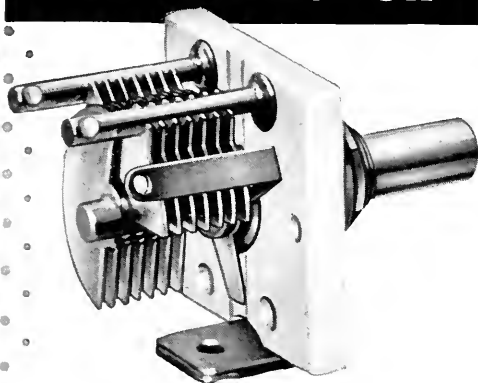
Interior view showing conservatively rated power equipment, heavy duty (PP810) modulator and push-pull ventilating fans. Shielded RF power amplifiers are parallel connected 4-250A's. High voltage supply (872A's) delivers 2500 volts at over 700 ma. Screen supply is VR tube regulated.



The Viking Kilowatt is compact yet completely accessible. Containing RF power amplifier, modulator, power supplies, and all control equipment, the entire unit rolls out of the pedestal on ball bearing rollers. This provides complete accessibility to all electrical components for adjustment or maintenance.

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Silicone treated steatite insulation. Single hole or base mounting. Special spacing or capacity values, finishes and other modifications are available to manufacturers on special order.



For your free copy of The Hammarlund Capacitor Catalog, which gives listings of the complete line of standard capacitors, write to The Hammarlund Manufacturing Co., Inc., 460 West 34th St., New York 1, N. Y. Ask for Bulletin C1.

# HAMMARLUND

(Continued from page 78)

WNH, WPY, WXL, YDL, YYL, YZE, ZCI, ZCM, ZDA, ZDB, ZKS, ZLK, ZPM, ZRE, and ZXO. Most of these stations already have earned their Section Net certificates. Traffic: W4KKW 180, K4FBW 138, W4ZLK 92, SBI 80, SYD 30, JCN 25, ZDB 22, PXX 20, AZQ 18, CDA 16, JUI 6.

**MICHIGAN** — SCM, Fabian T. McAllister, WSHKT — Asst. SCMs: Bob Cooper, 8AQA; and Joe Beljan, 8SCW. SEC: G.H. RMs: URM, NUL. At this writing the SCM has just returned from a couple of weeks down in Norfolk and Portsmouth, and found the mailbag loaded with letters from the gang! Patience, fellows, and I'll get them all answered. There was a goodly pile of traffic reports, too, and quite a few new calls were seen. Welcome, fellows, let's hear from you often. ELW made BPL again this month; our only one. Looks like Seth is going out after that award in earnest. MQH and OQH are new NCS on QMN, and have been doing very well. FX is battling power-line noise in the receiver, and thinks he has it licked. MGQ has moved to Huntingdon Woods, so won't be heard (except on mobile) for a month or so. DLZ reports a new "wind direction indicator" on his garage roof. He says his 40-meter vertical really leans under the wind! The Mount Pleasant Club has taken over the radio class in the Adult Education Program at High School. The Motor City Club has a new and very interesting club bulletin. The Hard Luck Award of the month goes to SCS. He moved as far into the country as he could in order to avoid powerline QRM, etc., and now the power company is building a high voltage line (and we do mean high!) right past his property! Traffic: WSELW 517, NUL 280, ILP 187, FLI 175, ZLK 150, IX 110, RTN 94, NOI 78, FX 59, MQH 52, QOQ 50, MLR 48, JKN 45, NTC 41, DSE 36, PHA 29, OQH 25, TBP 22, IV 17, TIJ 17, HKT 14, ZHB 14, OT 12, MGQ 11, DLZ 10, INF 8, KXN 8, WVL 8, AUD 7, EGI 7, HSG 7, WXO 6, IJ 5, JPE 4, PHM 1.

**OHIO** — SCM, John E. Siring, W8AJW — Asst. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8JNF; and E. F. Bonnet, 8OVG. SEC: UPB. RMs: DAE, FYO. PAMs: EQN, HUX. In an effort to more closely coordinate the State's communication department OVG, Dayton, has been appointed Asst. SCM and EQN, Springfield, has been made a PAM. On Oct. 9th the Ohio Council of Amateur Radio Clubs held a meeting in Columbus. The delegates voted in favor of FCC Docket No. 11157. New OCARC affiliates are the Toledo Mobile Radio Assn. and Franklin Mike and Key. A copy of the Council's constitution and by-laws may be had by writing Ralph E. Cramer, W8VHO, 236 South Burgess Ave., Columbus 4, Ohio, secy. The OCARC offers trophies for both Field Day and Sweepstakes Contests, awards the WAOC certificate, and sponsors the Ohio Intrastate QSO Party. EQN is contest and awards manager. HUX is on s.s.b.s.c. with an 8875 exciter and 813 final. LJ has moved from Dayton to Cleveland. LJS, former QSL Mgr., has returned from Florida to live in Cleveland. DAE got tapped by an induced voltage from lightning during a recent snowstorm. WAV was appointed NCS, Air Force MARS Net No. 9. RXM is the call of the Dayton Civil Defense Hq. GDQ was heard by EL2X and LU3EL on 160 meters. MQQ made WAS, SPU and QOV are holding the c.d. fort in Wyandot Co. NYL was married Oct. 23rd with 94ZN as best man and 9QBJ as usher. ZOD got married recently. The Tiffin group meets the 1st and 3rd Mon. at 8:00 p.m. in the Tiffin City Hall. The CACARC reflected its 1954 officers. Thirty-one Toledo amateurs participated in the recent S.E.T. with CRA and HUX serving as net control stations; 44 messages were handled. Congratulations to ERR and his group on the noteworthy job they did during the recent Ohio River flood. According to DSX, mgr. of 8RN, RO, DSX, LHV, and FYO are the most consistent Ohioans in the net. TLW lost his masts three times during the month, once because of termites, once from a windstorm, and lastly from falling tree limbs. Dayton's RF Carrier advises that PTF and HCD are on s.s.b.s.c. on 75 meters; HB, CUJ, YCP, and GQ rank 1, 2, 3, and 4, respectively, in the Ohio section in the recent F.M.T.; FIB showed up as a fireman at a fire at HCD's QTH recently; JAO/M now is a minister in Athens; KKH recently suffered a broken ankle; ZOF is suffering from an allergy called drooping antenna; and the Dayton 5:00 p.m. Mobile Net meets on 29,600 kc. We regret to report the untimely death of DL, and extend our deepest sympathy to his family. Cincy's Mike and Key states that PR and YTM are in Germany where they are working with the "Voice of America," while Queen City's other publication, *Ether Waves*, informs us that LPD and PBU have 32-element 2-meter beams; EV recently worked his 143rd country; and 14 members have gotten past the 100-countries-worked goal. The *Fort Hamilton Bulletin* mentions that HXB lectured on grid-dip meters at the last club meeting and RIDJ was a guest at a recent get-together. Springfield's Q-5 advises that the club soon will become incorporated. The Columbus *Carascope* states that MRC has installed three 9 full-wave 20-meter "V" beams; BAX has worked 20 states on 144 Mc.; OMV has a kw. on s.s.b.s.c.; and GL has returned from the hospital. *Shack Gossip* from over Toledo way tells us that there are 10 licensed YLs in town; NB,

(Continued on page 84)



**THE HQ-140-X...**

# SEEMS TO STRETCH THE BANDS



HQ-140-X

In these days, when the amateur bands are more crowded than ever, it's important to make sure the receiver you buy will bring in the desired signal with minimum interference from adjacent channels. That's why more and more 'hams' are turning to the HQ-140-X communications receiver.

The HQ-140-X's outstanding performance under today's difficult operating conditions is achieved because of the Hammarlund patented 455Kc crystal filter and phasing network. This circuit, identical to the one used in the Super Pro-600-JX professional receiver, is controlled by a front panel 6-position Crystal Selectivity switch and provides

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The Crystal Phasing control is a differential-type variable air capacitor which permits precise adjustment of the crystal selectivity for extremely high attenuation of closely adjacent channel interference.

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The HQ-140-X is the receiver in the radio shack of many American Merchantmen. Its dependability and ruggedness make it very popular with seagoing hams.

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# HAMMARLUND

SINCE 1910

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MODEL GD-1B

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4 lbs.

with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

The invaluable instrument for all Hams. Numerous applications such as retuning, neutralization, locating parasites, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1 1/2 meter Ham bands. Complete frequency coverage from 2–250 Mc. using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at \$3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dialing coils. Free calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

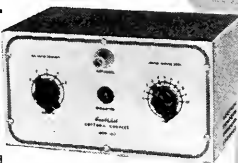
## Heathkit ANTENNA COUPLER KIT

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Rugged design has resulted in a sturdy, well shielded unit featuring a copper plated chassis and shield compartment. Coaxial 52 ohm receptacle on the rear of the chassis connects to a three section Pi-type low pass filter with a cut-off frequency of 36 Mc.

Tuning network consists of a variable capacitance and tapped inductance in an impedance matching unit.

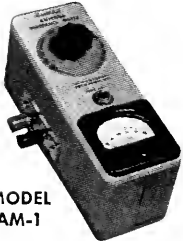
Capacity coupled neon lamp serves as a tuning indicator and will also provide a rough indication of power output.



MODEL AC-1

**\$14.50** Ship. Wt.  
4 lbs.

## Heathkit IMPEDANCE METER KIT



MODEL  
AM-1

**\$14.50** Ship. Wt.  
2 lbs.

tive null indicator. Shielded aluminum light weight cabinet. Strong self supporting antenna terminals.

The Heathkit Antenna Impedance Meter is basically a resistance type standing wave ratio bridge, with one arm a variable resistance. In this manner it is possible to measure radiation resistance and antenna transmission line impedance; approximate SWR and optimum receiver input. Use it also as a monitor or as a field strength meter where high sensitivity is not required. Frequency range of the AM-1 is 0–150 Mc and range of impedance measurements 0–600 ohms. The circuit uses a 100 microampere Simpson meter as a sensi-

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IZQ, and BZD form the TRC's committee for giving Novice exams; the HYE's received a bundle from heaven — a girl; Novice QCT has 41 states confirmed toward WAS; and a Lucas Co. QSO Party will be held on Jan. 15th from 8:00 P.M. until midnight on 160, 80, and 10 meters, sponsored by the AREV with HNP serving as referee. Eastern Ohio's *Ham Plashes* reports that SKF is a new Novice in Newton Falls; HSP, of Phalanx, has a new 50-foot steel tower; SFG has 21 states on 2 meters, while RSW has 19; JZY recently completed a 35-day leave prior to assignment in England; KBC has finished basic training at Sampson; and EJC is attending Kent State U. Traffic: (Oct.) W8FYO 342, ARO 222, LHV 164, REL 133, DAE 109, DQG 106, MQQ 102, AMH 94, RO 83, HUX 76, RXM 60, AJH 52, CRA 48, ILC 48, AL 31, OXS 28, FPZ 26, SRF 23, AJW 22, LMB 21, HNP 19, RN 18, IJH 17, KIH 13, TLW 12, BEW 11, HHF 11, HXB 10, PBX 10, WAV 10, ROX 9, ET 8, QIE 8, GZ 7, HFE 7, BLS 6, EQN 6, OQP 6, LXE 5, SPU 5, MGC 4, NQQ 4, AQ 2, GDQ 2, PM 2. (Sept.) W8AMH 57, ZAU 28, LFX 24.

## HUDSON DIVISION

**EASTERN NEW YORK** — SCM, Stephen J. Neason, W2ILI — SEC: RTE, RM: TYC, PAMS: GDD, IJG. K2EHI has a very effective 14-Mc. beam working. Congrats to K2BSD, who made BPL again. I regret to report the passing of our PAI, JQI; also 71PM, recently modified to K2HTD. K2HVN is active on NNETN. OKI is working plenty of DX on 7 and 14 Mc. with a new all-band rig and dipole antennas. CGT, WVS, and ZBS have new sixteen-element beams on 144 Mc. MHE is back on 144 Mc. and is organizing a v.h.f. society. AIH and K2BCU are operating portable from Boston on 144 and 29 Mc. LEL joined the CAP. LWI moved from Long Island to Pok and is active on 144 Mc. with an 829 final. HIQ squirts a signal from Brewster on 144 Mc. Welcome to BGO, who moved into Rockland County. HJO has a new VFO for his Bandmaster. LDS and PCQ have new beams on 144 Mc. HFQ, RO for Rockland, is on 144 Mc. from Nyack. Our annual Eastern New York section conference held at the YMCA in Pok recently proved to be worth while and interesting to all who were able to attend. Your SCM acted as chairman. SEC RTE and EC LDS were in charge of the arrangements and provided the meeting place. Other officials and guests present were OBU, Hudson Division Director; 1NJM, ARRL NEC; BGO, of the NYSCD commission; J. Gaul, C.D. Director Putnam County; and ECs LEL Ulster, ZTZ Rockland, and HZZ Pok. K2DQH is mobile on 29 Mc. K2BRY is operating portable from Johns Hopkins University. Because of a change in QTH BVU will be limited to mobile and portable operation on 144 Mc. New in Schenectady is KN2JTY. RML is back on 144 Mc. All clubs interested in the Eastern New York Council of Clubs, please write EFU for information. Traffic: (Oct.) K2BSD 536, BE 50, EOQ 42, W2EFU 31, ILI 24, K2EHI 12, HVN 5, W2APH 1. (Sept.) K2EOQ 20, W2BSH 18, K2HVN 4.

**NEW YORK CITY AND LONG ISLAND** — SCM, Carleton L. Coleman, W2YBT — Asst. SCM: Harry Dannels, 2TUK. SEC: ZAI, PAM: JZX, RMS: VNJ, LPJ. ZAI reports a good increase in AREC activity with excellent S.E.T. results. KGN, Brooklyn EC, sparkplugged the biggest AREC gain in the section. Nassau County radio amateurs once again demonstrated amateur radio in action at the Mineola Fair, operating K2DHC/2 on all bands. YBT is active from a new location in East Hampton on 75 and 80 meters and reports that WSL is 100 per cent ham-controlled at the transmitter plant with W2s AJR, BTC, CRZ, and YBT there. AEE participated in the Columbia University Bicentennial Convocation. K2CRH reports that the BAREC Net has shifted operations to 3700 kc. and invites Novice participation, listening for KNs around 3710 kc. GP says he has been QRL but reports into four nets and had a high score in the CD Party. MDM says business pressure keeps him from more than 20 hours of hamming per week. K2EWJ reports fine results with new 20-meter two-element shortened beam with Viking II and HQ-140X. The CCNY club station, HJ, is on the air with high power and 75A-3 receiver. KN2JPG is a new Novice at HJ. K2HTO recently dropped the "N." Stayvance HSRC, CLE, has reorganized with K2DGR, president, and K2DKQ, trustee. The station is on the air with an NC-98 and ARC-5 looking for traffic skeds around 3650 kc. weekdays between 1250 and 1400. The Amityville Memorial School Club has elected KN2IYK, pres.; and K2DOQ, vice-pres. New members of the Fordham Radio Club are W2AMR, K2HID, and KN2s IAD, JBK, and JRR. NFW is on 10 meters with 300 watts to a ground plane. K2HKH has a pair of 6146s in the new rig under construction. K2AMP was made a Class I Observer. Besides some excellent observing, Wally visited 1AW and had time to snag F8FW/FC on 20 and 40 meters. K2DGT is active on 20, 40, and 80 meters with HT-18 pushing 813s. IEH can be heard on 75 meters. EBZ reports excellent attendance at the Amateur Radio Teletype Society meeting, where BFD demonstrated some RTTY gear. K2EOF and KN2ITS are new members of the ever-growing NYRC. AEF has changed Novice code and theory instruction to Wed. night. K2IYK

(Continued on page 86)



# New

## Heathkit VFO KIT

MODEL VF-1

**\$1950**

Ship. Wt. 7 lbs.



Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical

and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

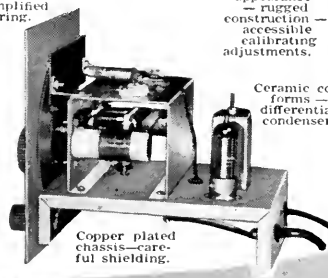
This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard 1/2" crystal holder. Construction is simple and wiring is easy.

- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 7 Band coverage, 160 through 10 meters—10 Volt RF output.
- Copper plated chassis—aluminum cabinet—easy to build—direct keying.

Open layout—easy to build—simplified wiring.

Smooth acting illuminated dial drive.

Clean appearance—rugged construction—accessible calibrating adjustments.



Ceramic coil forms—differential condenser.

Copper plated chassis—careful shielding.

## Heathkit AMATEUR TRANSMITTER KIT

MODEL AT-1

**\$2950**

Ship. Wt. 16 lbs.



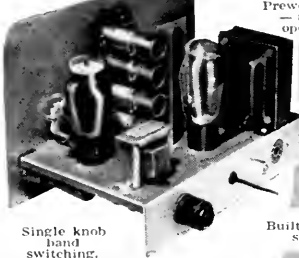
### SPECIFICATIONS:

Range 80, 40, 20, 15, 11, 10 meters.  
6AG7 ..... Oscillator-multiplier.  
616 ..... Amplifier-doubler  
5U4G ..... Rectifier.  
105-125 Volt A.C. 50-60 cycles 100 watts. Size: 8 1/4 inch high x 13 1/4 inch wide x 7 inch deep.

Crystal or VFO excitation.

Prewound coils—metered operation.

Rugged, clean construction



Single knob hand switching.

Built-in power supply.

52 ohm coaxial output.

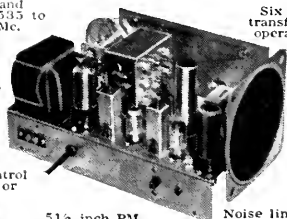
Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

## Heathkit COMMUNICATIONS RECEIVER KIT

Four band operation 535 to 35 Mc.

Stable BFO oscillator circuit.

RF gain control with AVC or M.V.C.



5 1/2 inch PM Speaker-Headphone Jack.

Six tube transformer operation.

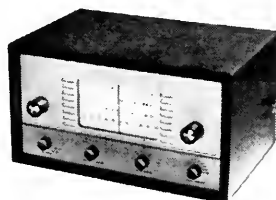
Electrical bandspread and scale.

Noise limiter—standby switch.

### SPECIFICATIONS:

Range.....535 Kc to 35 Mc  
12BE6 ..... Mixer-oscillator  
12BA6 ..... I. F. Amplifier  
12AV6 Detector—AVC—audio  
12BA6 ..... B. F. O. oscillator  
12A6 ..... Beam power output  
5Y3GT ..... Rectifier  
105-125 volts A.C. 50-60 cycles, 45 watts.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.



MODEL AR-2

**\$2550**

Ship. Wt. 12 lbs.

### CABINET:

Proxylon impregnated fabric covered plywood cabinet. Ship. weight 5 lbs. Number 91-10, \$4.50.

**HEATH COMPANY**  
BENTON HARBOR 9, MICHIGAN

is now General class and can be found rock-bound on 7052 kc. AOD worked 7 stations on 420 Mc. in the recent V.H.F. QSO Party. PF now is single-sidebanding with 20A exciter. KR, JVO, GJX, K2DW, and others are pushing high power on s.s.b. It was your reporter's pleasure to attend the recent QCWA dinner with my OM, GG. The old-timers had a splendid turnout and presented an excellent audience for KUJ's talk on s.s.b. The QCWA Net meets on Sun. at 1100 on 3810 kc. RB soon will be heard on 144 Mc. now that the boating season is over. GYL was heard chasing DX on 7 Mc. EEN has high-power final under construction. With 1955 upon us, let's check our equipment so that we radiate the best signal possible. Watch the modulation and the keying. Remember, too, switch to safety! See you in the V.H.F. Sweepstakes. Traffic: (Oct.) W2KEB 697, K1V 642, LPJ 411, K2CQP 301, W2AEE 153, OMIE 84, K2CRH 80, W2JOA 63, K2ABW 58, W2GP 40, GXC 39, K2DDU 17, W2EC 17, 1AG 14, GPQ 12, K2HID 10, EWJ 9, CMV 3, W2JBQ 3, OKU 3, K2DVT 2, HYK 1, W2TUK 1, (Sept.) K2EOR 175, DEB 54, W2GXC 52, JGV 30, ZM 16, MUM 9.

**NORTHERN NEW JERSEY** — SCM, Lloyd H. Manamon, W2VQR — Asst. SCM: Charles Teeters, K2DHE, SEC: IIN, PAM: CCS. RMs: NKD, CGG, EAS. K2DSW is temporarily QRL because of school at RCA in New York City. K2CHI was active in the CD Party. The Irvington Radio Amateur Club meets in the Community Center Bldg. the 1st and 3rd Mon. of each month. Code and theory classes are conducted every Mon. night. Automatic tape machines are available for code practice, which are run at speeds qualifying the students for either Novice or General Class. Interested parties are invited to attend the club meetings and code classes. If you desire to work the Club Net look for it on 28.7 Mc., every Sun. at 1200 hours. This is a very business-like club, gang, so take advantage of the offer and pass the word around to prospective new hams. If you desire to write the club, contact K2DZR, 65 Garrison St., Newark. K2BEV again is active in OO work. CQB, PAT, GUM, ENM, and K2DHE put on a demonstration of amateur radio communications for local fire departments. The Windblowers V.H.F. Society held its installation dinner on Nov. 14th. A special QSL card still is available to anyone working a member of the society. K2EUN is NCS on JN each Mon. evening. Bogota is organizing a mobile civil defense net. K2GPB has his new mobile rig working FB. KN2JOM is working out real well with his Heathkit transmitter. BRC worked in the CD Party for the first time in over four years. K2BCK will be QRL after this month because of active duty at sea with the Navy. EAS has been out of town on a business trip K2BAY is back on the c.w. bands and is doing a bit of experimenting on antenna systems. Brad also is active on the New Jersey C.W. Civil Defense Net, 3505.5 kc., Sun. at 1900. 2ZEP/7 is in the Air Force down Arizona way. He has obtained an ORS appointment in the Arizona section, but will be back in Northern New Jersey next year. DRV is active in JN, daily except Sun.; 3695 kc. OO reports were received from DME, GVZ, TPJ, NIY, K2BEV, AFQ, and BWQ. K2DHE is making test runs with his new mobile installation up and down Sunset Ave. Much QRM to K2ICE results from these tests which pass by in front of his QTH. Annie, the assistant YL operator at K2ICE, holds the local QSO record on 144 Mc. K2HNA discovered to his extreme regret that his 144-Mc. antenna has been terminated at the change-over relay box. Result, no DX. HJL is on 75-meter 'phone with the new rig. George visited New England and came home with his brother's 150-B rig. KN2GVB is keeping the 144-Mc. band hot at his QTH. NIE has terminated his yachting activities for the season and is back on 75 meters again. K2CTL is sporting a new ham shack in the attic. The arrival of a new daughter forced him to vacate his former downstairs comfortable shack. K2ARQ, a member of the local Marathon QSO Net, stays right with them with the aid of a full pot of coffee. Traffic: (Oct.) W2CQB 68, K2BWP 61, BWQ 43, EUN 42, W2EAS 26, FMP 21, K2IKS 14, W2BRC 10, K2GER 8, W2CVW 6, K2BAY 5, BCK 4, KN2JOM 3, K2CHI 2, W2CJX 2, NIY 2, (Sept.) K2DSW 63, W2DRV 12, (Aug.) W2DRV 16.

## MIDWEST DIVISION

**IOWA** — SCM, William G. Davis, W0PP — PP re-turned much refreshed from his vacation. Many thanks to SCA for subbing for me. The North East Iowa Radio Club had a very successful c.d. drill Oct. 31st, with 13 mobile rigs and all towns in Black Hawk County using their emergency rigs. BDR and SCA have received their traffic award medallions. BLH was elected TLN mgr. CGY is getting some DX with his 1½-kw. TNY completed his 813 VFO-controlled all-band transmitter and gave it to the radio club. BXR, IIMM is conducting radio classes at the club with 30 prospects up for examination soon. There are 5 YLs in the class. BJP, laid up with kidney trouble, is getting in a lot of hamming. LJW is a new ORS. ZAN is back on TLN. KVJ, a recent addition to TLN, is NCS on Mondays. Ex-QAO now is K4AQQ. VYH is a new Burlington ham just out of the Army. LCX is getting on 2 meters. NGS reports that Ft. Dodge now has 49 paid members. BQC/θ along with IVS/θ and WN0UNC, is trying to

get a ham club going at Luther College. LGG has a new Collins 32V-3. TVC reports most of his activity is on 2220 and 4020 kc. on MARS and 1815 and 3970 kc. KWT and HWU have been holding weekly radio classes. THU is a brand-new father. SFK got his Conditional Class license Oct. 22nd. The reporting was swell this time. Keep it up, fellows. Traffic: W0SCA 1124, CZ 257, LJW 106, BLH 35, KVJ 31, KJN 30, QVA 22, LCX 20, NGS 19, JTF 18, SFK 16, W9BQC/θ 14, W0DDV 12, RMG 12, EHH 11, LGG 10, TVC 7, HWU 6, NYX 3, PAN 1.

**KANSAS** — SCM, Earl N. Johnston, W6ICV — SEC: PAH, RM: KXL/NIY, PAM: FNS. The Scott County RACES Plan has been approved with ZUX as Radio Officer and YLO as CD Director. The Topeka-Shawnee County c.d. area hams are organizing a 2-meter net on 145.5 Mc. ONF, of Howard, plans to start a code practice schedule Mon., Wed., and Sat. at 1730 on 3805.5 kc. EOT plans to help part time. The Lawrence Emergency Net meets each Sun. at 1400 on 3820 kc. K0FED is a new National Guard station at Concordia with a Viking II, VFO, and NC-125 receiver, according to KSY, and will be active in the Air Force MARS nets as well as other amateur activity. VGA is a new station in Mulvane. Bob uses a Viking Ranger with a vertical antenna to put out that FB signal. LBJ, who is working on a new 600-watt rig, took time to participate in the CD Party working 10 sections. MOX, of Lawrence, keeps daily skeds with EMS in Adair, Iowa, on 2 meters. Louis has six states on 2 meters and is open for skeds with anyone anywhere. WIZ, of Emporia, is new Asst. EC for the Neosho Valley Amateur Radio Club at Emporia. UAT, of Fort Scott, is building a new 250-watt rig. Thanks, fellows, for your support in the SCM election. We hope to do bigger and better things for the section in the next few years. Traffic: (Oct.) W0BLI 566, NIY 331, OIH 138, EOT 137, WGM 107, TOL 94, FDJ 85, MNG 84, MLG 51, ECD 45, NFX 41, FEO/θ 35, QMU 33, MAJ 32, UMV 26, ABJ 22, SVE 22, ONC 21, ONF 21, AAJ 20, LOR 19, HS 17, DEL 16, UAT 16, LIX 15, KFS/θ 12, LBJ 10, RBO 9, ICV 8, KAJ 8, NLV 8, TNA 8, YFE 8, SEP 7, TSR 7, YOS 7, QGG 6, VRZ 6, LOW 4, LQX 4, (Sept.) W0EOT 138.

**MISSOURI** — SCM, Clarence L. Arundale, W0GBJ — SEC: VRF, PAM: BVL, RMs: OUD, QXO. Missouri lost one of its most active old-time hams when CRM recently passed away. CPI handled a large volume of traffic originating in the area affected by Hurricane Hazel. OUD advises that MON is meeting at 7:00 a.m. in addition to the regular evening net schedule time because of present skip conditions. WYJ/4 has received his ticket and will be at home in St. Louis in April. BZK has earned his 1,000 Traffickers Club certificate. ORP and GFF are located at the Ardmore AFB. SZT now has a 75A-2. TDF has a Viking II and SX-71 in operation. WN0VPM uses an Eldico TR-75TV and HQ-140X. S.E.T. activities were reported by HUI and FKM. CPI raised his doublet to fifty feet. Bad skip conditions on 40 meters kept GAR's traffic total down. FLN reports 25 members are taking code classes in preparation for their Novice Class examination. K0FBO is installing a Johnson 20-meter beam. The radio club at Southwest Missouri State College, with LQC as trustee, has applied for a station license. IJS recently visited CKQ to pick up a few pointers on the new 813 rig that IJS is building. We hear that CKQ recently received an A-1 Operators Club certificate. DOA has a 10-watt s.s.b. exciter that works out in fine shape. MUX recently completed his new rig which runs 450 watts to an 813. JUY did a beautiful job in constructing the all-band 2E26 rig recently described in QST. AKS still has audio "bugs" troubling him. Traffic: (Oct.) W0CPI 927, QXO 501, GAR 240, BVL 175, CKQ 55, EBE 39, KIK 30, HUI 29, OUD 27, KA 24, GBJ 21, BKV 20, RTW 18, QWB 12, BUL 10, CXE 4, FLN 4, QBX 4, QNF 4, TGC 4, BZK 2, ETW 2, TCF 2, ZWI 2, (Sept.) W0BVL 59, QNF 6.

**NEBRASKA** — SCM, Floyd B. Campbell, W0CBH — Asst. SCM: Tom Boydston, 0VYX, SEC: JDJ, PAM: EUT. The North Platte Club now has a call, W0WYM. The transmitter will be located upstairs over the County Sheriff's office. The SCM suggests that appointees check certificates and get them in for endorsement. EXP has a 20A exciter and is figuring on 811s for the s.s.b. final. IJK is rebuilding his s.s.b. for 300 watts. RIG has the 4-65A working fine. RIG has a new 7-lb. 8-oz. YL. CBH built the 50-kc. frequency standard in July STQ. AQJ gets nice reports with his new B. & W. 5100. JCK has moved to Albuquerque, the land of mobiles. QMD is using a WRL Globe King. QMW is using 40-meter vertical. QOU, PHW, VKQ, and AIY are heard on 2 meters. A 2-meter net for Nebraska is shaping up with 145.35 Mc. as the frequency. State-wide coverage is almost assured. The frequency was picked to be in the RACES portion of the band. NET has stacked a TV antenna on his 65-ft. 10-meter beam. ERM had such good results with his flea-power mobile recently that he has given up the idea of more power (mobile). VQR is president of the Tri-City Radio Club at Scottsbluff. QKR is vice-president. IRW and FTQ are members of AREC. UOV is NCS for the North Platte Club Net. Traffic: W0TQD 1836, K0AIR 1314, W0FQB 230, ZJF 230, FTQ 51, AEM 49, MAO 38, IITA 35, KDW 25, VYX 23, EQG 16, ORW 14,

(Continued on page 88)



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Included in the incomparable list of Eimac developed electron-power tubes, which range to 9600mc and 25 kw power output, are six favorites of Amateur Radio Operators. Application-proved in many types of commercial and military service, the 4-65A, 4-125A, 4-250A, 4-400A and 4X150 radial-beam power tetrodes and 4E27A radial-beam power pentode possess the inherent features of Eimac multi-grid tubes—high power gain, minimized neutralization needs, and on-the-air economy. Mobile or shack, 2mc or 420mc, CW or phone, there's a tube in the Eimac Amateur's Big Six to do the job for you with a wallop. When visiting your distributor ask for Eimac—the mark of excellence in electron-power tubes.

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4X150G	450TH
4X500A	450TL
4X500F	592 3-200A3
4E27A 5-125B	750TL
3K20,000LA, F, K	1000T
3K50,000LA, F, K	1500T
3W5000A3	2000T
3W5000F3	2-25A
3W10,000A3	2-50A
3X2500A3	2-150D
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0-1.2-3-12-60-300-600-1200-6000 volts.
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0 DB = 1 Milliwatt, 600 ohms.
- ★ EXTRA LARGE 5 1/4" RUGGED 'PACE' METER:  
40 microamps sensitivity, 2% accuracy.
- ★ 1% MULTIPLIERS and SHUNTS
- ★ TWO JACKS SERVE ALL STANDARD RANGES
- ★ "TRANSIT" SAFETY POSITION on range selector protects meter during transport and storage.
- ★ CUSTOM-MOLDED PHENOLIC CASE and PANEL

MODEL 120... complete with internal ohmmeter batteries, banana-plug test leads and detailed operating manual. Overall Case Dimensions 5 3/8 x 7 x 3 3/8"

Net Price \$39.95

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RNH 14, K0WBF 14, W0KLB 12, WR 12, AIN 10, JDJ 10, CBH 9, PDJ 8, PZH 8, HXH 7, PQT 7, OCU 6, PQP 6, LEF 4, LRK 4, NBS 4, OFL 4, RRH 4, CIH 3, DJU 3, NGZ 3, HQN 2, JHI 2, THX 2, POL 1, UVU 1.

## NEW ENGLAND DIVISION

**CONNECTICUT** — SCM, Milton E. Chaffee, W1EFW — SEC: LKF, PAM: LWW, RM: KYQ, MCN and CN 3640, CPN 3880, CEN 29,580 kc. RAN got home from W.P.I. for the CD Party and has added a beam for 14 Mc. UBM, daughter of EBO, married YOC in September and ham radio was the factor that brought them together. CHX is ex-4TGO, now active from West Hartford. UJG has abandoned 220 to concentrate on 144 Mc. NFG reports a successful "Operation Goblin" as a Hamden Halloween c.d. exercise. Current officers of the Bristol Radio Club are VOV, pres.; ZFH, treas.; and YOY, secy. The Southington Amateur Radio Assn. was organized in October with GVT pres.; ZZZK, vice-pres.; GVZ, secy.; ZTQ, treas.; and SBI, activities. New ECs: OGQ and RMG for Waterbury and New Haven. ORS renewals: RWS, QJM, and KV. EC renewal: RFX. LWW reports for CPN: 101 stations participated with ZFF, LIG, VWL, MLT, and DAV most active. MNF has gone s.s.b. AWV now has General Class ticket and is active on 2- and 10-meter mobile. RRE is much better after a long illness. COB is active again with a Viking. Welcome to ex-3EDA, 9ADE, now active in West Hartford as 1EDA. APA snagged HK0AI for country No. 30 on 40-meter 'phone. WPO now is DXCC. We regret to note FWII now is a Silent Key. NJM enjoys mobile c.w. BDI hit BPL this month largely from the RTTY Net. GTH and ZZZK are on 420 Mc. RBF is rebuilding for a pair of 6146s in the final. WNICKA is building up practice on 40 meters. VOS and VOV attended the W4 YL picnic in Virginia. TD transmits Official Bulletins on 146 Mc. CN handled 300 messages in 22 sessions, according to RM KYQ, with a high of 36 in one night. KYQ, RGB, and LV are high in QNI. MCN handled 88 in 21 sessions with IBE, YYM, and RFJ sharing QNI honors. CTN, just under-way, has adjusted schedule to Sun. morning, with RFJ and HYF doing the NCS work. New Net certificates went to FMU, FTM, LWW, MLT, RMZ, VWL, DAV, KGT, VOV, UED, HUM, and YUP. Everybody set for the FCDA radio test in Region 1 in February? Thanks for the many reports; keep 'em coming. Traffic: WIAW 309, CUH 268, YBH 198, KYQ 154, BDI 132, LIG 90, NJM 87, HUM 82, HYF 73, RGB 58, QJM 56, YU 47, YYM 43, VOS 38, LV 37, BV3 33, EFW 33, FTM 28, RFJ 25, KV 19, VOV 19, UED 16, APA 6, EDA 2.

**MAINE** — SCM, Bernard Seamon, W1AFT — SEC: BYK, PAM: WRZ, RM: OHT. The Sea Gull Net meets at 1700 on 3960 kc. Mon. through Fri.; the Barryard Net at 0730 on 3960 Mon. through Fri.; and the Pine Tree Net at 1900 on 3596 kc. Mon. through Fri. Recent OPS appointees are WTG, LYR, UDD, and WRZ. Ex-IXIXE is back on in Damariscotta with a new call, BWI. BX has worked seventeen countries with his underground antenna, using 35 watts input. ZNL is in the veterans hospital at Togus for a check-up. TWR is in the CMG hospital at Lewiston for an operation. Latest report is that both are doing well. LHA is off for his annual cruise in southern waters with the Maine Maritime Academy Training Ship. He is the radio officer. Our new PAM is going great guns and is keeping your SCM busy issuing OPS and Section Net certificates. What is with you and the Pine Tree Net, OHT? We miss your usual fine reports. BPI has his Donald Duck working. The BBC has been coming in right well on 3960 kc. during Sea Gull Net time. The music is very pretty blended with the cries of the wild gulls. Your SCM and his YL wish you all a Happy New Year. Traffic: W1WTC 220, LKP 131, UDD 38, TVB 32, YVW 18, AFT 17, LYR 15, BTY 14, LHA 13, BX 12, EFR 11, UOT 11, VYE 9, WRZ 9, ZBN 9, NXX 7, YTE 7, RSC 5, LOA 3.

**EASTERN MASSACHUSETTS** — SCM, Frank L. Baker, Jr., W1ALP — New appointments: WLU as EC for Watertown, NF as OBS, BPW as OBS. Appointments endorsed: ATP Holliston, AVY New Bedford, HJ Dover, MON Stoughton, UBB Boxford, QOL Lynn as ECs; AVY and HUP as OPSs; AVY, BDI, ENG, and EPE as ORS; ALP and UIR as OBSs; QWQ as OES; UE as RM for 80-meter c.w.; TVZ, Hopkinton, as EC. Please add to your list of nets the Braintree Emergency Net on 28,560 kc. Mon. at 2100, and change the frequency of Weymouth and Holbrook to 28,580 kc. TF3CJ is attending MLT, and took part in the recent F.M.T. along with PXII and LQQ. GAG's XYL won an SX-88 receiver at the New England Division Convention. AKN moved to Sandwich. A Region 5 committee meeting was held with DFS, BL, RM, TQP, KTG, NJN, ALP, ZYX, and CQ present. A Sector 5 meeting was held with GNL, GOF, FWS, SH, UXN, MME, THY, SMV, ISU, EKG, ALP, and MD present. K2BJB/MM is on 10 meters in Boston Harbor. The Braintree, Weymouth, and Quincy mobiles were out on Halloween with the auxiliary police. Heard on 2 meters: CAV, YTB, and LXR. Heard on 40 meters: FED, VAL, AL, BEV, VPP, CNG, UKG, TWN, EYP, AYN, KIX, ALX, TFD, ABJ, BJT, MNW, QNC, LIU, and YKD. Mobile

*Continued on page 90)*

# MALLORY HAM BULLETIN

## MALLORY 6-Volt Battery Charger Keeps Mobile Unit on the Go



Those of us who have tried mobile operation are fully aware of the very difficult problem of how to keep the car battery charged adequately for starting purposes, and still provide plenty of juice for a reasonable amount of time on the air.

Recently, one of our good amateur friends, who is a red-hot mobile fan, told us of a method he used for keeping his battery at top performance and still add no extra equipment to his automobile. His system sounded so practical, that we'd like to pass it along.

Here is what he did. First, he visited his Mallory distributor and bought a small, inexpensive Mallory 6-volt Battery Charger (the 6SAC6 or 12SAC5 for 12-volt systems) together with a special automobile Cigarette Lighter Plug (Mallory R675) to be used for inserting the Charger output into the electrical circuit of his car. The Lighter Plug was attached to the Battery Charger and the

whole business was then mounted conveniently in his garage.

After an evening of mobile operation, he simply inserted the Plug into the cigarette lighter socket, turned on the 117 VAC line, and the next morning, presto, his battery was ready for heavy starting action.

With this very convenient arrangement, this ham was able to operate his mobile rig the year 'round, with little fear of even tough wintertime starting.

Incidentally, if your car is not equipped with a cigarette lighter, don't let that handicap you, simply ask your distributor for a Mallory Dashboard Receptacle (R652) which may be clamped to the dashboard without drilling a single hole. Used in conjunction with a Cord Assembly (R670) this arrangement will provide all the convenience afforded by the lighter plug method of installation.

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### 10 M. BEAMS

**S103T • Std. 10m 3-El. T match, \$18.95.** 1—8' Boom, 3/4" Alum. Tubing; 3—6' Center Elements, 3/4" Alum. Tubing; 6—6' End Inserts, 3/4" Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

**D103T • DeLuxe 10m 3-El. T match, \$25.95.** 1—8' Boom, 1" Alum. Tubing; 3—6' Center Elements, 1" Alum. Tubing; 6—6' End Inserts, 3/4" Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

**S104T • Std. 10m 4-El. T match, \$24.95.** 1—12' Boom, 1" Alum. Tubing; 4—6' Center Elements, 3/4" Alum. Tubing; 8—6' End Inserts, 3/4" Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

**D104T • DeLuxe 10m 4-El. T match, \$30.95.** 1—12' Boom, 1" Alum. Tubing; 4—6' Center Elements, 1" Alum. Tubing; 8—6' End Inserts, 3/4" Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

### 15 M. BEAMS

**S152T • Std. 15m 2-El. T match, \$22.95.** 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 3/4" Alum. Tubing; 2—5' End Inserts, 3/4" Alum. Tubing; 2—7' End Inserts, 3/4" Alum. Tubing; 1—T Match (6'), Polystyrene Tubing; 1—Beam Mount.

**D152T • DeLuxe 15m 3-El. T match, \$33.95.** 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 2—5' End Inserts, 3/4" Alum. Tubing; 2—6' End Inserts, 3/4" Alum. Tubing; 2—7' End Inserts, 3/4" Alum. Tubing; 1—T Match (6'), Polystyrene Tubing; 1—Beam Mount.

### 20 M. BEAMS

**S202N • Std. 20m 2-El. (No T), \$21.95.** 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/4" Alum. Tubing; 1—Beam Mount.

**T202T • Std. 20m 2-El. T match, \$24.95.** 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/4" Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Mount.

**D202N • DeLuxe 20m 2-El. (No T), \$31.95.** 2—12' Booms, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/4" Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Mount.

**D202T • DeLuxe 20m 2-El. T match, \$34.95.** 2—12' Booms, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/4" Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Mount.

**S203N • Std. 20m 3-El. (No T), \$34.95.** 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/4" Alum. Tubing; 1—Beam Mount.

**S203T • Std. 20m 3-El. T match, \$37.95.** 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/4" Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Mount.

**D203N • DeLuxe 20m 3-El. (No T), \$46.95.** 2—12' Booms, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/4" Alum. Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

**D203T • DeLuxe 20m 3-El. T match, \$49.95.** 2—12' Booms, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/4" Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

on 10 meters: UCP, RBA, LXZ, KZW, RES, OHB, ZPI, QLB, TTS, and YMV. WNICRO is a new ham in Quincy, KLC is on 2, 6, and 10 meters. New Novices: CAF, CAS, CDR, CNW, CPQ, CPW, CQB, CQC, CQE, CQL, and CSP. Tech. Class: WQII and YRI. Other new hams: BTX, AAV, and CPP. BJW has General Class license and added 2E26 to the rig. MKW reports a Cape Cod 10-meter Net on 28.9 Mc. with VTX, FQK, YXJ, YQT, UMC, DVS, BLM, ONK, ZLIC, and BMW on 160 meters. BPA, ex-3FAU and SZNQ, now is in Aetna and will be on with a Viking Ranger. The Braintree Radio Club held a meeting and a discussion on a 2-meter net. Radio Amateur Open House held a meeting at the Cambridge YMCA with a talk by CFW. ZVI is the call of the Pequotsette ARS in Watertown, ALP has his Viking II kit going and is on 10 meters. WPV is all-mobile operation and is on MARS and other nets. VTT has a new NC-125. MKW reports the following on during the storms on the 2-meter Net: MFL, BCN, ARC, CFQ, MKW, MBQ, PMIC, BLM, JN1, DJK, WMIN, MNF, OMQ, LYV, WHC, TQS, BFI, AQY, UCM, GRC, OH, LNR, TZ, WNS ZSJ, ABQ, and AQN. UYT has new 10-meter ground plane. VTZ has co-ax for 10 meters on the roof. BLM has a Viking Ranger. BLM is on 144 and 230 Mc. JN1 has mobile Elmac. BGW is on RCTY most of the time, and worked DL4RO on 20 meters. RCTY is on 2, 6, and 10 meters and his wife, ZEN, also is on. OSS is on 20, 40, and 80 meters. The License Plate Committee of the South Shore Club is going into action. TVF is in Germany with the Army. AKN's son, VPTN, is on 20 meters. New officers of the Waltham ARA, MHL, are NXX, pres.; QMN, vice-pres.; 2BV, secy.; HIRV, secy. of the Wellesley ARS are FFO, pres.; IRR, vice-pres.; OQP, treas.; WGM, secy. SS gave a talk on "Proper Procedure within the Operations of an Emergency Net" at the last meeting. The Malden ARA held an auction with HKG auctioneer. Sorry to report the death of QPR, trustee of BWU. The T-9 Radio Club held a meeting at WNK's, AZU has an antenna farm location. ZPE is teaching his XYL the code. CNT has TBS-50D and HQ-129X. CDO is awaiting a Ranger transmitter. BND has an Elmac rig. PJ, Everett EC, reports that TNI was on during the storm using gas power with walkie-talkies and mobiles BHD, YTD, JIXY, KNA, SXH, RLF, and VXE. TJW, Falmouth EC, reports that during Hurricane Hazel the net was on with QLT, LYV, DVS, UXG, and TJW, with WNM, the club station, as NCS. BB is getting ready for the 160-meter DX tests. BPW is working on Yagi beam and is on 2 meters. The Falmouth Amateur Radio Club has a training program going on at the Recreation Bldg., Wed. at 8 p.m. New members are CCR, AIV, UXH, CMT, and DJK. The Winthrop drill had BDU, CMW, DJ, OIR, MQB, BOX, BB, and XYLS on the air. VIS is busy on the crystal units for their TR4s. BOX is running a code class. PYK and YZP are on 10 meters. Traffic: (Oct.) WUOK 535, EPE 144, EMG 67, AVY 56, UE 42, IBE 32, QLT 32, VTT 25, NUP 10, TY 9, WU 9, WPW 6, BY 4, UTH 3, AHP 2, DWO 2, LLY 2, (Sept.) WUNUP 38, UE 34, IBE 32, BGW 13, ZDQ 4, AHP 2, EMG 2, (Aug., Sept.) WIMWK 26.

**WESTERN MASSACHUSETTS**—SCM, Roger E. Corey, WIJYH—RM: BVR. WNM meets at 7 p.m. EST Mon. through Fri. on 3560 kc. New officers of the Hampden County Radio Assn., Inc., are KUE, pres.; IIRV, vice-pres.; VNE, treas.; and UKR, clerk. RAD, AAY, MVF, and PCQ were elected directors. Proud new owners of Viking Rangers in the Springfield Area are TTL, OBQ, and MNG. JRA will maintain Official Bulletin schedules on 3555 and 3830 kc. daily. For times drop a card to JRA at Amherst College or to the SCM. EFQ has a new tower with a 10/20-meter rotary ready for the DX Contest. UVI conducts a code class twice weekly at his home in Westfield. Any prospective hams who are interested may contact him. The October CD Party produced a record turnout in Western Massachusetts with ABD, YXV, VEC2KC, TVZ, WDW, SRM, ZIO, HRC, JYH, WEF, W2AKJ/WI, CJK, RRR, KFY, WCC, YCG, and AMI taking part. WDK is operator at MARS station KIWAU and has a new Elmac AF-67 at his home station. BVR spoke at the New England Division Convention held at Manchester, N. H. This is my last column as SCM. Your new SCM is Art Zavarella, MNG, 1702 Main St., Agawam, Mass. I would like to thank those who contributed to this column during the last two years and especially BVD, BVR, COL, TVJ, and TAY, who reported every month without fail. My special thanks also to the many throughout the section who gave so much of their time to support ARRL activities in the public interest and in every phase of the hobby. I know you all join me in promising Art the same cooperation that I have had and in wishing him the best of success. Traffic: K2BCB/1445, WUOK 372, WAG 84, HIRV 79, BVR 66, WCC 34, XING 28, UVI 25, TAY 19, WDK 14, PRX 12, WDW 11, JYH 9, ABD 7, YXV 5, OBQ 1, TVJ 1.

**NEW HAMPSHIRE**—SCM, Harold J. Preble, WHIS—SEC: BXU. RM: CRW. Asst. RM: TBS, PAM, AXL. At the request of the new SCM, HHS, GMH is writing this month's report as HS has just been elected and has not had time to get started. All the best to you, Hal. WUU is NCS for the TCPN on Saturday nights. He has the rig formerly owned by GMH with S13s in the final. The Concord Brass

(Continued on page 92)

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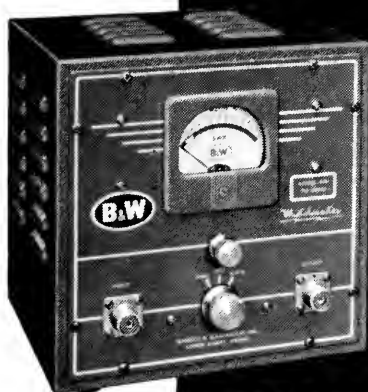
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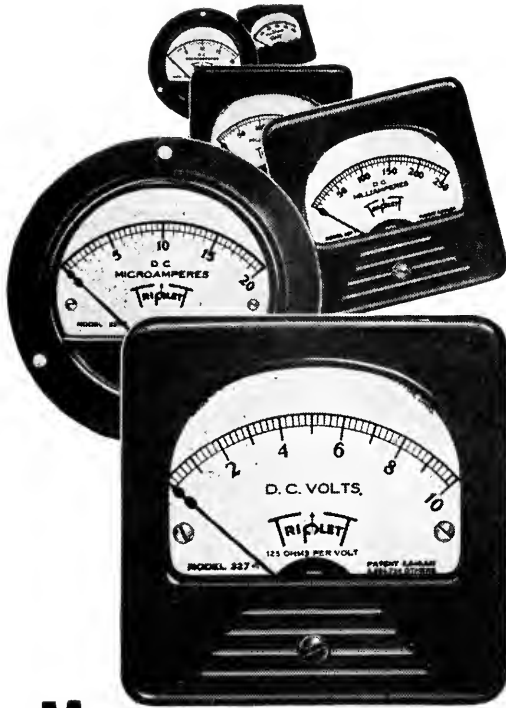
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Pounders held an enjoyable Halloween Party at the Kettle and Crane House in Boscawen, N. H. PTB received honorable mention in the local paper for keeping the c.d. personnel well informed of the progress of Hurricane Edna. YVK has a new 32V-3. TRM is having fun on 40-meter 'phone. WUG has an Elmac A67 and says it is FB. UNV gets to use the Marine station, K4MC, to QSO back home. We welcome BYD to New Hampshire from Pennsylvania. Glad to see PFU has recovered enough from his fractured hip to discard his crutches. 9BQC wants schedules with New Hampshire stations to complete WAS during the Christmas holiday. Write to him at 2811 Custer Ave., Rockford, Ill., if you can help him out. Traffic: (Oct.) W1WUU 54, GMH 50, COC 36, QGU 26, FZ 7. (Sept.) W1QGU 22.

**RHODE ISLAND**—SCM, Walter B. Hanson, jr., WIKKR—SEC: MIJ. RM: BT. RIN meets Mon. through Fri. at 7 P.M. EST on 3540 kc. Meet the gang Sundays at 11 A.M. on 1890 kc. This 160-meter net is growing fast and is the best we've had yet. JFF, YAO, and WN1AYZ did a great job providing communications for the sport car time races at Newport. AYZ's new Gonset at the finish complemented JFF's home-built at the start. In an attempt to learn just how the various towns on Aquidneck Island could perform together when we have our next hurricane, BBN Portsmouth, ULS Tiverton, and JFF Newport acted as control centers on a combined 2-meter 10-meter fixed/mobile test. 4TSD/1, 4CVO/1, ZUX, and ZUL were the mobile end of the team. All the control centers were operated on emergency power. TRX, ZJQ, YAO, YAP, and MMX monitored the test. The NAARO's bean supper and auction on Nov. 4th was attended by about 125 Rhode Island hams. A very welcome letter was received from ZXA which will be turned over to KKR for next month's report. JBB, with the writing of this report, completes his tour of SCM duty and wishes KKR a prosperous two years. Please help KKR as much as you have JBB. Traffic: (Oct.) W4CVO/1 33, W1FDS 8, YAO 8. (Sept.) W1VXC 127, ULS 115, YAO 66.

**VERMONT**—SCM, Robert L. Scott, W1RNA—SEC: SIO. PAM: RPR. RM: OAK. Vermont nets: VTPN 3860 kc., 0930, Sun. only; VTN, 3520 kc., 1900, Mon. through Fri.; GMIN, 3860 kc., 1200-1300, Mon. through Fri.; Vt. C.D. 3993 and 3501.5 kc., alternate Sun., 1000. Several XYs of the Burlington boys are active on Novice frequencies. Is that why we seldom hear the boys from that area on 75 meters? The news comments around the State seemed to have faded out before reaching this QTH, so—Traffic: W1OAK 126, AVP 85, RNA 69, IT 24, VZIE 14, TXY 6, UGW 1.

## NORTHWESTERN DIVISION

**ALASKA**—SCM, Dave A. Fulton, KL7AGU—AOW, formerly of Anchorage, now is looking for KL7 QSOs from home with the call W4BFO. ABT expects to depart for W7-Land early in '55. AWB still is looking for a DXCC prior to his departure sometime in '55. Many KL7s in the Anchorage Area expect to go s.s.b. on all bands in the near future. BEW has worked eight maritime mobiles on 15 meters; she also has 29 states confirmed for her WAS and sure is working hard to get the balance. CP has tied a Viking Ranger to his squashed rhombic and it sounds mighty fine. The Anchorage Amateur Radio Club held an election and the lineup for '55 is as follows: AOT, pres.; ATL, vice-pres.; BHE, secy.; BDU, treas.; PIV, act. mgr. The long-awaited c.d. radio gear has arrived and is in the process of being placed now and should be in operation before too many more months. Traffic: KL7AWB 18.

**IDAHO**—SCM, Alan K. Ross, W7IWU—Twin Falls: NH is busy with PAN trying to find some volunteers with high power for NCS. Kellogg: RQG is the new Emergency Coordinator for Shoshone County. Gifford: VWS is applying for ORS appointment. Lewiston: ONP has his mobile installed in the new Oldsmobile. OOV has recovered after spending four days in the hospital. WN7VIO is looking for some new crystals since he took the Conditional Class exam in October. From hamming radio to Hammond organ is OOW's range. The Lewiston and Boise gang helped the police on Halloween. Boise had a 2-meter link to 10-meter mobile stations. Caldwell: EYR now has a Viking II and is putting up a 20-meter beam. Preston: RKI is active as Official Observer. Boise: GVN is back with us now after 6½ years in Africa. Two meters is active again with a station at the KBOL-TV site, up 7000 feet. Traffic: (Oct.) W7NII 113, RQG 66, RSP 34. (Sept.) W7VWS 6.

**MONTANA**—SCM, Leslie E. Crouter, W7CT—The Great Falls Radio Club is starting a training program in theory and code. WIF and RIL are on 420 Mc. RRI is on mobile. QPK returned to school in California. UWN is on s.s.b. RIL moved across town. JRG rebuilt the s.s.b. exciter and 813 linear final. SFK is building a ham shack. SFK and TGF are NCS for the North Montana 160-meter 'phone net operating on 1995 kc. at 1900 MST. Laurel reports the Simulated Emergency Test was witnessed by the local Red Cross and newspaper representatives. TTC and RDM built new VFOs. SMY and UXA are rebuilding transmitters. LER, JFR, CJN, LNS, LNU, OIO, and CDW, all Butte mobile stations, operated a mobile relay chain (Continued on page 94)



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**R C and L F HALL**  
Houston, Galveston,  
Beaumont, Texas City, Texas

**HARVEY RADIO**  
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**HENRY RADIO STORES**  
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**HUDSON RADIO**  
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San Francisco, Calif.

**RADIO EQUIPMENT**  
Buffalo, Batavia, Niagara  
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**RADIO SHACK CORP.**  
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**SPECIALTY DISTRIBUTING**  
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**J. V. STOUT**  
Baltimore, Md.

**TERMINAL RADIO CORP.**  
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**VALLEY ELECTRONICS**  
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The CD-2 is a combined 2 meter crystal controlled transmitter and double conversion super heterodyne receiver. It is designed for CD fixed and emergency operations, and is engineered to meet all the rigid specifications of the FCDA. The CD-2 is a rugged, quality constructed unit, dependable for the serious work of CD — ideal for just pleasant QSO'ing on two. Compare these fine outstanding features . . .

- **110 VAC AND 6 VDC OPERATION**
- **RCVR SENSITIVITY: 0.5 MICROVOLTS**
- **IMAGE REJECTION: 60 db**
- **HARMONIC SUPPRESSION: 60 db**
- **8 CRYSTAL CHANNELS**
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- **6252/AX9910 P.P. FINAL**
- **PLATE MODULATED**
- **ANTENNA INPED.: 32 - 72 OHMS**
- **PROVISIONS FOR COMPLETE REMOTE CONTROL**
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- **AVAILABLE FOR 6 METERS (CD-6)**

A complete resume available  
on request to CD Division —

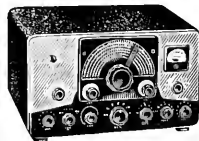
**SONAR RADIO CORP**  
3050 WEST 21st ST., B'KLYN, N. Y.

# LOOK



Plug-in 3 KC filter adapter for SP-400.....	\$ 65.00
Plug-in 3 KC filter adapter for HRO-60.....	65.00
75A-3 receiver.....	530.00
Matching speaker.....	20.00
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Conversion kit for 75A2, with 3 KC mechanical filter...	80.00
Plug-in adapter for 75A1, with 3 KC mechanical filter	65.00

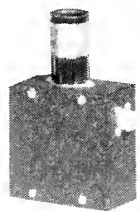
## Johnson Viking "RANGER"



**Viking RANGER Kit**, with all parts, assembly and operating manuals, less tubes.....**\$179.50**

Kit of tubes.....**\$23.00**

**Factory wired RANGER**, tested and ready to go, with full instructions, less tubes.....**\$258.00**



## WRIGHT T-R SWITCH

For break-in operation on CW, AM, or SSSC. Use one antenna for transmitting and receiving. It's instantaneous! No moving parts, no power needed to operate. Coax fitting for connections to feeder and receiver. Will handle 1 Kw. With 75 meter plug-in coil....**\$9.95**  
40, 20 meter coils, **\$1.75** each



## 8/8/8 MFD.

**500 V. D.C.**

Triple 8 mfd. 500 working volt D.C. oil-filled condenser, common negative, solder terminals, hermetically sealed, 5" x 3 3/4" x 2 1/4".....**\$1.95**



## PHOSPHOR BRONZE AERIAL

125 ft. of the finest aerial wire obtainable 42-strand phosphor-bronze with linen center. Will not stretch, very high tensile strength, diameter approximately same as No. 14 copper, very flexible. Excellent for transmitting or receiving antenna, control cable, guy wire. Regular list \$4.95.....**90¢**

All prices F.O.B. Cincinnati  
20% deposit on C.O.D. orders

# Steinberg's

Phone CHerry 1880

633 WALNUT STREET • CINCINNATI 2, OHIO

between Butte and Helena during the Simulated Emergency Test. FUB checks in regularly on Montana and South Dakota c.w. nets. NZJ checks into the North Montana and South Dakota 160-meter 'phone nets every day. CT sends ARRL Official Bulletins Mon. through Fri. on 3520 kc. at 1830 MST. Recent endorsements or appointments: RSJ, FUB, and DSS as EC; NSJ, PCZ, and TDW as OPS; SFK as OO, Traffic; W7CT 56, CJN 32, LBK 28, FUB 14, SMT 7, TTC 5, NZJ 3, QGJ 2, RDM 2, IRN 1.

**OREGON** — SCM, John M. Carroll, W7BUS — OJA now believes that roller skates and radio do not mix and has a broken leg to prove it. SBT uses a bicycle mobile. ISP is new Medford Area EC. IEY is visiting clubs on the Coast speaking on MARS. HUI is out of the hospital and back on the air. JHA has retired from the Navy and plans to spend the rest of his life hamming. WAT is new Asst. ESC and is ORS and OPS for Oregon. QFY and the OARA planning committee are working on the convention to be held in Portland May 7 and 8, 1955. KTL finally got a one-eyed monster. IIDN and NSD are the same fellow. The Teenagers Net in Oswego is going along fine. UAB has WAS. RVN is teaching code classes for the OARS. TNF is a CAP communications officer. NWE finally is planning on s.s.b. SY and family have moved to Salem. AZP and KR have been hunting elk. TVW was reelected president of the Pendleton Radio Club. FFD has turned brick-layer and is building a fireplace. VCII has a new jr. operator. The Cascade Net on 29.2 Mc. had 425 check-ins, with PRU as high check-in station for the month. The Oregon State Net had 24 sessions with a total attendance of 203. The whole net is out for AREC with a c.w. net for AREC stations. Traffic: (Oct.) W7APF 553, WAT 93, ESJ 74, AJN 52, LZG 51, QEI 50, TBT 49, THX 42, PRA 41, WLL 13, IIDN 11. (Sept.) W7HDN 19, KTL 6.

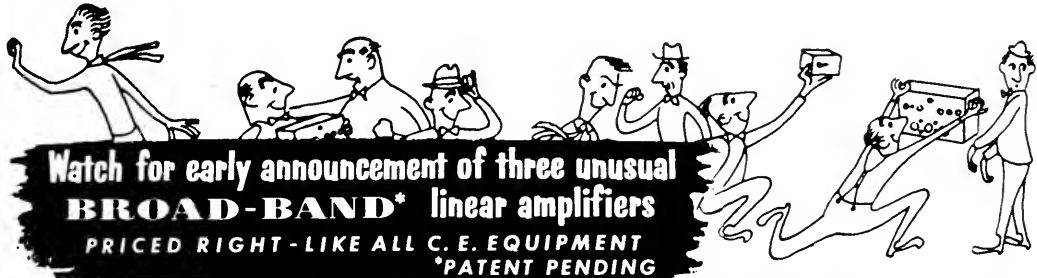
**WASHINGTON** — SCM, Victor S. Gish, W7FIX — The Richland Amateur Radio Club, Inc., meets the 2nd or 3rd Mon. at the QTH of OHS at 8 p.m. Officers are NLI, pres.; RMQ, vice-pres.; KIIJZ, secy.; RJO, treas. The Tacoma Amateur Radio Society meets the 1st and 3rd Fri. at South Park Community Center at 8 p.m. Officers are SOL, pres.; ETX, vice-pres.; GVV, secy. The Radio Club of Tacoma, Inc., meets the 2nd and 4th Wed. at the Red Cross Bldg., 7th & Broadway, at 8 p.m. Officers are AZI, pres.; RNS, vice-pres.; OVW, secy.; QPM, treas. Tacoma's RACES plan has been approved by FCDA and now is in the hands of FCC. EVW and OS attended the Puget Sound RTTY meeting at the QTH of KV. Bremerton Club members attended a Tacoma Club meeting at which there was a discussion of call letter license plates. UYK is mobile with the Babcock transmitter he won. MFG had to unwind his antenna after a recent windstorm. JHX is on 441.36 Mc. video; also the Puget Sound 2-meter Net, 145.8 Mc., at 8 p.m. Mon. UQY submitted an FB 40-meter OO report. 6REF/7 now is at Redmond. Welcome back to the section. Betty! FRU, BA, and PGY made BPL again. PGY is displaying his BPL medallion. BA made BPL in the first half of October and took off for another vacation in K116-Land. LFA is back Stateside after duty in the Far East. EHH lost ten days on the air because of a broken ankle as the result of a hunting accident. FWD sends code practice Mon. through Fri. 1800 PST, 3695 kc., followed by Official Bulletins transmitted at 1845 PST. AIB spent the last half of October vacationing in the Southland. ZU skeds jr. operator (PRZ) on 14 Mc. each Sun. at 20XM. TGO reports school is cutting into his hamming. AMC is setting up a ham demonstration at the state capitol to help get plates. KT talked to six state senators and representatives re license plates. AHQ is building a new 'phone-c.w. rig. AVM is QRL work. SFN is hunting TV Indians. PHO has 94 countries and is handling Far East traffic. ULK's family is 100 per cent ham. ETO is hunting deer. ETX is running l-kw. s.s.s.b. — about 500 watts a.m. OCA reports Army Radio was assigned 3612 kc. by mistake. Happy New Year to all! Traffic: (Oct.) W7FRU 888, BA 825, PGY 740, FIX 69, OEB 64, VAZ 40, USO 34, AMC 23, APS 18, EHH 18, TGO 18, BG 16, AIB 14, WND 14, ZU 13, FWD 12, ETO 11, KT 10, PQT 10, JEY 9, EVW 5, ULK 5, AHQ 4, AVM 4. (Sept.) W7KZ 101, SOI 66, EHH 21, VRL 17.

## PACIFIC DIVISION

**NEVADA** — SCM, Ray T. Warner, W7JU — KOA, of Elko, received very favorable newspaper publicity when he talked down a disabled Douglas Skyraider to safety from the Elko CAA tower. UPS has erected a new 20-meter three-element beam. VIU received his "Worked 25 Nevada" certificate. Virginia, SNP, keeps busy on 75 and 40 meters, 'phone and c.w., since receiving her new ticket. AI, of K7FDB, reports activity in a 2-meter net picking up and increased mobile activity on 7268 kc. K7FDB, who makes BPL every month, handled 1048 during October. VZS, of Las Vegas, is heard on 10 meters when the band is open. VIU, UPS, KOA, and QYL were active during the recent S.E.T. SEC, PAM, and OO appointments are available to qualified members. Traffic: W7JU 8, VIU 8, UPS 2.

**SANTA CLARA VALLEY** — SCM, R. Paul Tibbs, W6WGO — KGBAM is holding daily sked with KL7BEX. K6EER is active on 40 meters. EEX is spending time on v.h.f. UTV is very QRL with color TV. YHS is finishing

(Continued on page 96)



**MODEL 20A**

MULTIPHASE EQUIPMENT is the overwhelming choice of SSB OPS everywhere. Ask any ham who uses it! Listen to it perform on SSB, AM, PM or CW!

### MODEL 20A

- 20 Watts Peak Envelope Output SSB, AM, PM and CW
  - Completely Bandswitched 160 thru 10 Meters
  - Magic Eye Carrier Null and Peak Modulation Indicator
- Choice of grey table model, grey or black wrinkle finish rack model.
- Wired and tested..... **\$249.50**  
Complete kit..... **\$199.50**

### SIDE BAND SLICER

#### MODEL A IMPROVES ANY RECEIVER

Upper or lower sideband reception of SSB, AM, PM and CW at the flip of a switch. Cuts QRM in half. Exalted carrier method eliminates distortion caused by selective fading. Easily connected into any receiver having 450-500 KC IF. Built-in power supply. Reduces or eliminates interference from 15 KC TV receiver sweep harmonics.

Wired and tested..... **\$74.50**  
Complete kit..... **\$49.50**

### Check These Features NOW IN BOTH MODELS

- **Perfected Voice-Controlled Break-in** on SSB, AM, PM.
- **Upper or Lower Sideband** at the flip of a switch.
- **New Carrier Level Control.** Insert any amount of carrier without disturbing carrier suppression adjustments.
- **New Calibrate Circuit.** Simply talk yourself exactly on frequency as you set your VFO. Calibrate signal level adjustable from zero to full output.
- **New AF Input Jack.** For oscillator or phone patch.
- **CW Break-in Operation.**
- **New Gold Contact Voice Control Relay.** Extra contacts for muting receiver, operating relays, etc.
- **Accessory Power Socket.** Furnishes blocking bias for linear amplifier and voltage for optional VFO (Modified BC458 makes an excellent multiband VFO.)
- **40 DB or More Suppression** of unwanted sideband.

## EVERYBODY WANTS MULTIPHASE EQUIPMENT

and for good reason. It's versatile, permits all-band operation 10 thru 160, it's extremely stable and it's a well engineered, dependable piece of communications equipment.



### MODEL 10B SUCCESSOR TO THE POPULAR MODEL 10A

- 10 Watts Peak Envelope Output SSB, AM, PM and CW
  - **Multiband Operation** using plug-in coils.
- Choice of grey table model, grey or black wrinkle finish rack model. With coils for one band.
- Wired and tested..... **\$179.50**  
Complete kit..... **\$129.50**

### QT-1 ANTI-TRIP UNIT

Perfected Voice Operated Break-in with loudspeaker. Prevents loud signals, heterodynes and static from tripping the voice break-in circuit. All electronic — no relays. Plugs into socket inside 20A or 10B Exciter.

Wired and tested, with tube.... **\$12.50**

### AP-1 ADAPTER

Plug-in IF stage — used with Slicer, allows receiver to be switched back to normal.

Wired and tested, with tube.... **\$8.50**

### NEW AP-2 ADAPTER

Combined AP-1 and xtal mixer. Allows Slicer to be used with receivers having 50, 85, 100, 915 KC and other IF systems. One xtal suffices for most receivers. **\$17.50**

### WRITE FOR LITERATURE

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EQUIPMENT**

*Central Electronics, Inc.*

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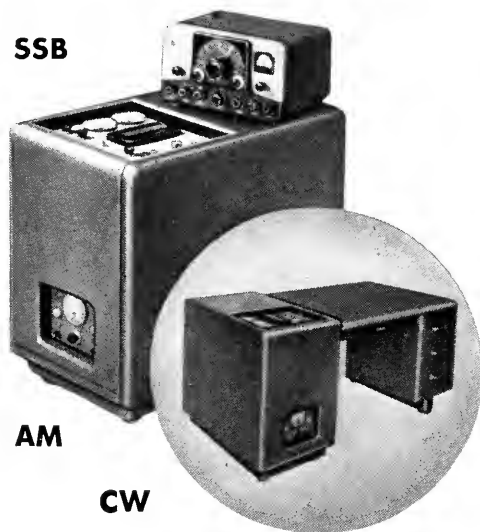
Watch For Early Announcement Of The New DeLuxe MULTIPHASE VFO.

# BRAND NEW!



## JOHNSON VIKING KW AMPLIFIER

**SSB**



**AM**

**CW**

**Frequency range—3.5 to 30 Mc.**

**Power input—1000 watts.**

**Thoroughly TVI suppressed.**

**Drive with your Viking I/II, Viking Ranger or 30 watt exciter.**

**Modulator frequency response, 200 to 3500 cycles  $\pm$  1DB.**

**No coil changing necessary.**

**Pi-network tuning.**

240-1000 Johnson, KW Power Amplifier with tubes, wired and tested...**\$1595.00**

251-101-1 Accessory desk top and right hand pedestal.....**\$123.50**

251-101-2 Accessory desk top and left hand pedestal.....**\$123.50**

**Write, Wire or Call**

**C & G Radio Supply Company**

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Phone  
BR 3181

s.s.b. exciter using surplus crystals. It can be heard being used by TTB, BM has a new QTH in San Jose. Pappy puts in time off the air working at the plant of EL. NX reports working ZLs on 20-meter s.s.b. as early as six in the evening. W1B is using grounded-grid amplifier one 837 driving two in parallel driving up to about 500 watts input in s.s.b. This amplifier is the answer to you boys looking for medium power at little expense. C.w. operators are needed in the section to work on RN6, PAN, and TCC appointments. All those who can give one night a week to this work will find much pleasure helping with an important job. More information can be obtained by contacting IIC in San Jose. Well, gang, this is my first report as your SCM. With your help the section can be one of the most active in the ARRL field organization. You can help by sending reports of your activities as well as those of your friends. Keep others posted on activity in your club through this section in QST. Many of your club members keep in touch with home by reading this each month. Have your reports in the mail by the first of each month. Traffic: W6HC 145, UTV 50, K6BAM 16, EER 6.

**EAST BAY — SCM,** Guy Black, W6RLB — Asst. SCMs: Oliver Nelson, 6MXQ (v.h.f.); Harry Cameron, 6RVC (TVI); SEC: WGM RMs: HPW, JOH, PAM; LL, ECs: CAN, CX, FLT, QDE, TCU, ZZP, K6ERR. A reminder to all ARRL appointees — it's time for most of you to have your appointments renewed. Those who have not made any kind of report for the last year are especially urged to drop me a note. If I do not hear from them it will be assumed that they no longer are interested in their appointments. The Skyriders Radio Club has new officers: NCL, pres.; BSE, vice-pres.; Dot Crill (ZOE's XYL), secy.; MMK, treas. and net control. The East Bay teen-agers have KN6HEJ, pres.; KN6GBZ, vice-pres.; K6EHW, secy.; and KN6HRE, program chairman. HRE also is presi lent of the El Cerrito High School Radio Club. EHW says her QTH seems to be headquarters for the Magoons and the K6NCG gang. Second-hand reports have come this way to the effect that the Richmond gang feels that there is not enough news about them in the column. Shur-ks, gang, don't be so bashful. Let me know what's cooking and you'll see it in print. EJA is reported to be enjoying a receiver, and QDE is reported to be rebuilding. The Richmond Club now has a Viking for a club rig. The Hayward Radio Club's TVI committee includes PUH, LGF, SIF, and AXW. OHTG is the East Bay Radio Club's TVI chairman. FDJ is heading the Oakland TVI Committee. All of these groups report a very satisfactory TVI situation this last year with relatively few complaints. BNE has built a new speech limiter. FDG is working s.s.b. skulls with Japan. ITH reports work on 15- and 40-meter 'phone. YDI had a spell in the hospital. ACN had an operation which it is hoped will get him back in tip-top shape. WZR has a new job. GOP recalls the good old days on 160 meters with flea power. NDR has a new beam due from his XYL. LL reports traffic despite his busy duty as MTN traffic manager. Region 3 civil defense has started a series of drills on 6 meters. 47 Mc., 1761-ke. DCS band. K6ERR will get two different AREC nets going in the Berkeley-Albany-El Cerrito Area. Fifty-eight persons attended the East Bay Radio Club's dinner. The Mt. Diablo Radio Club's 3rd Fri. at 8 P.M. in the Coast Counties Gas. Co. Bldg., Walnut Creek. The teletype gang has set up a Sunday brea s-hedule 8 a.m. on the last Sun. of the month, percolator, Oakland. See FDJ for more details. Traffic: (O-A) K6FDG 1281, W6QPY 243, K6GK 156, WAF 108, W6LL 80, JOH 77, EFD 63, ASJ 35, ITH 34, YDI 9, EJA 8, CIB 6, K6EDN 4, W6OUU 1. (Sept.) W6LL 90.

**SAN FRANCISCO — SCM,** Walter Buckley, W6GGC — SEC: NL. Congratulations to the new officers of the San Francisco Radio Club: AIHH, pres.; PHS, vice-pres.; QMO, secy.; and Harry Witzke, treas. Harry always keeps the books in the black instead of red. Although it was thought best for the club to change officers every two terms we couldn't spare Harry. The HAMS have decided to go on 6 meters. Those interested and new members are expected to join the group. The San Francisco Naval Shipyard Club is busily making plans for the Christmas Dinner to be held at the Naval Shipyard. AJF, of Sonoma, is busy rebuilding the rig, is doing additional work on the 2-meter beam design, and has completed a new v.h.f. receiver. The 29ers lost FVK to Uncle Sam. Gordon was a very faithful net control on 10-meter transmitter hunts and always Johnny-on-the-spot for c.d. drills. SLX was stationed at Treasure Island during October. Friends saw him at the San Jose Hamboree but he must have had very little free time as he never showed up at any of the local amateur club meetings. Ed said he was taking notes from the Bay Area back to Eureka with him. The 14 Mobileers and their families took a trip up to Carson City, Nev., to handle communications for the Admission Day Parade. EJY acted as net control in his new Oldsmobile. CTH sat at the judges' stand, acted as relay station, and watched all the beautiful girls as they marched by. GGC had the portable Elmec rig set up. ISO helped set up the antenna and the XYLs made corrections, omissions, and additions on the parade sheets for the announcer. Oh, yes, they also called the two amateurs to attention when the boys were too busy to hear net control contact them. They

(Continued on page 98)

# Technical Bulletin for Amateurs and Experimenters

## A Note About Crystal Tolerance:

In the manufacture of crystals, certain limits must be adhered to when finishing the unit. Such limits are often held to better than .001% for commercial applications. Tolerances of this magnitude mean nothing unless the oscillator in which the crystal is to operate is an exact reproduction of the oscillator in which the crystal was calibrated. This same thing applies to wider tolerances. Persons doing work where close tolerances are required, (Broadcast, Commercial Two-Way, Civil Defense, CAP, etc.) should keep this in mind. The FA-5 and FA-9 Crystals are guaranteed to be calibrated to better than .01% of the specified frequency. The average FA-5 or FA-9 Crystal is held to better than .005%. This tolerance applies only when the crystal is operated into 32 mmf, for fundamental crystals and anti-resonant operation for overtone crystals. The information shown in Table I is of value in setting the crystal to frequency. (Crystals of closer tolerance, and for special circuits, are available from our commercial line.)

TABLE I

	OSCILLATOR LOAD CAPACITANCE			
	32 mmf	50 mmf	20 mmf	10 mmf
MEASURED	2000	1999.950	2000.060	2000.200
CRYSTAL	3000	2999.800	3000.200	3000.600
FREQUENCY	4000	3999.700	4000.400	4001.000
IN	7000	6999.200	7001.200	7003.300
KC	14000	13998.0	14003.1	14008.1

Watch this space each month for useful notes, circuit diagrams, etc., published by the Technical Services Division of International Crystal Mfg. Co., Inc. Write for FREE booklet.

## ONE-DAY Processing

Spot Frequencies 2000 KC to 54 MC

## PRICES

FA-9\* (Pin Diameter .093)\*  
FA-5 (Pin Diameter .050)

Pin Spacing .486 (\*FA-9 fits same socket as FT-243)

RANGE	TOLERANCE	PRICE	
Fundamental Crystals		FA-9	FA-5
2000-9999 KC	.01%	\$2.80	\$2.70
10000-15000 KC	.01%	\$3.90	\$3.80
Overtone Crystals (for 3rd overtone operation)			
15 MC—29.99 MC	.01%	\$2.80	\$2.70
30 MC—54 MC	.01%	\$3.90	\$3.80

**.01% TOLERANCE**—Crystals are all of the plated, hermetically sealed type and calibrated to .01% or better of the specified frequency when operated into a 32 mmf load capacitance.

Orders for less than five crystals will be processed and shipped in one day. Orders received on Monday thru Thursday will be shipped the day following receipt of the order. Orders received on Friday will be shipped the following Monday.

## HOW TO ORDER

In order to give the fastest possible service, crystals are sold direct and are not handled by any jobber. Where cash accompanies the order, International will prepay the Airmail postage; otherwise, shipment will be made C.O.D. Specify your exact frequency and the crystal will be calibrated to .01% or better of this frequency with the unit operating into a 32 mmf load capacitance.

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# EVERYONES BUYING DELUXE "PHASEMASTER-JR." EXCITERS

Only  
\$194.50



## NEW DELUXE "PHASEMASTER-JR" CHECK THESE EXCLUSIVE FEATURES

- ✓ SSB with Switchable Sidebands also AM-PM and CW operation
- ✓ 50W Average Voice Power Input
- ✓ Heterodyning Phasing Type Exciter
- ✓ All band 160M thru 10M supplied with heterodyning crystal and coils for 80M operation
- ✓ 40DB or more SB suppression
- ✓ New Carrier Level Control - inserts carrier for AM operation - zero beating VFO—or tuning, without disturbing carrier suppression
- ✓ Superb Anti-Trip Voice Control operation with ATVC plug-in unit
- ✓ RCVR muting and final amplifier blocking bias
- ✓ New Eye Indicator — for carrier balancing — tuning — AM modulation
- ✓ Simplified operating controls

OTHER FAMOUS SSB EQUIP.  
Phasemaster-Jr. Exciter

Kit \$74.50 wired & tested \$92.50

P-500 Linear Final \$197.50

ATVC Voice Control plug-in Unit \$23.50

New Electronic Tenna Switch \$23.50

Write for complete catalog



**INDUSTRIES**

408 COMMERCIAL STREET MANITOWOC, WISCONSIN  
MANUFACTURERS OF PRECISION ELECTRONIC EQUIPMENT

were very busy watching the beautiful girls, also. The boys have taken over the 49ers Motel at Carson City each year and latest reports have it that the owners of said motel intend to spend the winter studying the code and hope to have W7 calls next year. 7ZT held his usual party for the gang the evening of the parade. Carson City certainly gives the amateurs a royal welcome each year. W6 calls heard in W7-Land were CTH, EJY, GCG, ISO, PAZ, UJ, UUQ, BMY, YPM, FNC, LFZ, OPU, and GGC. Sunday morning the boys had their usual club breakfast before setting off for home — all with a little lighter pocket-book. The 2-meter boys on c.d. have been invited to join the East Bay C.D. Net, 2 meters. ACN recently underwent an operation. Archie worked hard to get the license plates for the W6 boys. Calls were heard on MTN for blood donations and many responded. Congratulations to PHT on the BPL total. SWP didn't get his usual high score in as his wife was in the hospital. Reports are that she is well on the road to recovery now. Traffic: W6PHT 831, SWP 452, QMO 357 GGC 34, MWF 12.

**SACRAMENTO VALLEY** — SCM, Harold L. Lucero, W6JDN — Asst. SCMs: Ronald G. Martin, W6ZF; Edward V. Fuller, K6BMU; Gerald R. Hobbs, W6TMP. SEC: JEQ. Asst. SEC: EKP. OBSs: FNS, MWR, ILZ, SBN, AKF. OPSs: FNS, MWR, LJ. ORSs: ASX, SYY, FYK, LJ, OMR. ECs: ULC, AYU, EXP, JKA, NCV, SIY, SLV, CFZ, JDN. PAM: TYC. OESs: LSB, QAC. RM: OPY. OOs: BIL, FYK, FNS. These calls are for your future field and other ARRL contests. From now on the winter will bring us added contests as to our ability to cope with any emergency so, fellows, let's really be on the ball. We have lost one of our main traffic stations, REF. Betty has moved to Washington State. Luck to you at your new location, Betty. TYC reports that he is getting along very well with the PAM appointment. OPY is the man to get the c.w. nets on their way and I believe Harvey is doing everything possible. Keep up the good work, Harvey. SUP, K6GKR, and KN6HLO are father, mother, and son. SBH is more than filling his schedule as OBS. New officers of the Tehama County Amateur Radio Club are OEY, pres.; SBH, vice-pres.; TMP, secy.-treas. This is a very fine choice and the Club should go far. The new SJVN is now going and has several members in this section. I hear that this net is to change its name to the Central Valley Net. We are sorry to report that BHV had an auto accident and broke his back. 6ANR has moved to Nevada and now has the call 7ANR. Well, fellows, the appointments are coming along fine. Let's have more. Traffic: W6MWR 20, K6CFZ 15, W6JDN 10.

**SAN JOAQUIN VALLEY** — SCM, Edward L. Bewley, W6GIW — SEC: EBL. RM: K6BGM. PAMs: ZRJ, WJF. The SJVN is active again on 3635 kc. After getting poor results on CCN, our RM decided to try to get the old SJVN gang active again, and so far it looks hopeful. Any of you who are interested in handling some traffic, check in on 3635 kc. at 1900. A net has been started on 3900 kc. at 1100 Sun. by EBL in an attempt to bolster AREC activity and to help formulate ideas for the good of the section. It is hoped that all ECs and representatives from all the clubs in the section will check in regularly, and inform the rest of the section of the local activities. This also should help to coordinate activity between the various clubs. TXM is the new Kern County EC. FKY is in Detroit for a visit. A club is beginning to take shape in the Sonora Area. This will take in a large mountainous area, with hams widely scattered. These are adverse conditions for a club, but the gang is determined and we are sure it will be a success. A 2-meter transmitter hunt held by the Turlock Club was won by SQR, who was accompanied by GYN. The Stockton Club visited a TV station, watched a studio program, and then took a tour of the entire station. K6DUU and W6ZRJ presented very interesting and informative talks to the Turlock Club on incorporation and c.d. K6BGM is NCS on PAN Sat. nights. OHB is hunting in Wyoming. DVI attained an excellent rating in the last Frequency Measuring Test. Traffic: K6FAE 898, W6ZRJ 290, TTX 133, EBL 43, FEA 21, WJF 18, SJJ 15, ADB 10, K6BMM 3.

## ROANOKE DIVISION

**NORTH CAROLINA** — SCM, C. H. Brydges, W4WXZ — SEC: ZG. RM: VHH. PAM: ONM. OO: SOD. NCN is trying to get a new start on 3605 kc. There might be a few hams who remember the c.w. alphabet. YPZ has a new Telrex 20-meter beam. The Gastonia C.D. Net meets at 7 o'clock on 29,300 kc. A project by the members is to build portable transmitters and receivers with batteries for fixed or portable operation. The Charlotte C.D. Net meets on 3825 kc. at 9 A.M. Sun. Plans are now being looked over for a state-wide emergency organization in case of another "Hazel." FUS is making a roster of stations and their hours of operation during the hurricane. If your station has not been reported, mail information to FUS, Maiden, N. C. The call letter license plate bill is one we all have to work on. It is not a one-man or a group job. I have lots of information from the Virginia group which pushed it through in that State, and we have lots of work ahead of us. CZR is a new Official Bulletin Station. He transmits on 3860 kc.

(Continued on page 100)

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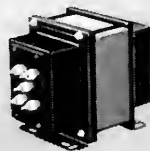
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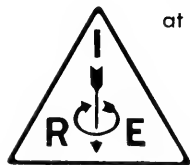
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**You'll hear** the presentation of scientific and engineering papers of vital interest to you, carefully arranged into related groups of technical sessions.

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at 2015 Mon. through Thurs. YPY has p.p. 813s and will be on with a "killer-watt" in the near future. A wide-spaced beam is used on 20 meters. I would like to take this opportunity to congratulate everyone who helped during Hurricane Hazel. All did a noteworthy job, especially the Wilmington boys, who were red hot. MVP and TLA are new ECs and VHH is the new RM. Happy New Year to all. Traffic: W4WXZ 20.

**SOUTH CAROLINA**—SCM, T. Hunter Wood, W4ANK—South Carolina amateurs did an outstanding job in providing emergency communications during Hurricane Hazel. Reports from ECs in Georgetown and Florence, W4FFH in Charleston, our PAM, and W9MQV/4, who operated from Myrtle Beach, have been consolidated in a report to the NEC. W9MQV/4 now is K4AQQ. ZIZ reports that his activity must be reduced because of the doctor's orders. LXX reports from Florence that FGX is working DX on 20-meter c.w., TSU has a new Harvey Wells transmitter, and LXX still is working toward WAS. ANK and TL in the last Frequency Measuring Test made average errors of 3.0 and 5.0 parts per million, respectively. WN4HOZ has worked 22 states with his 60 watts and reports that ERN, FM, HQC, and SBR have been a big help to him and he hopes to pass his General Class exam soon. WN4HGW has an HQ-129X and Heathkit transmitter. ANK and 3111/4 attended the Roanoke Division Convention and were the only South Carolina hams there. Traffic: W4ZIZ 88, FM 2.

**VIRGINIA**—SCM, John Carl Morgan, W4KX—VN and VSN meet on 3680 kc.; VFN on 3835 kc.; VON on 1820 kc., and ODN on 3845 kc. An outstanding job was done by the Virginia gang during Hurricane Hazel. The Blue Ridge ARC, Roanoke, keeps PCC fired up. The RARC is to be congratulated on its usual fine job of putting on a bang-up Division Convention. The Shenandoah Valley ARC's new club house now is under construction. New officers of the PVARC are 3GRF, pres.; KXV, veep and act. mgr.; AMZ, secy.; CC, treas. NRO, back at William and Mary, says the college club and PYN are back in business. Ex-PYNers 2KJE and 3UQU now are Mr. and Mrs. ZFV, back at V.P.I., reports a club is in formation there. The University of Virginia club station, SK1, was quite active during the summer. 3QQE really is keeping the Quantico Marine Hobby Shop station, PFC, rolling as evidenced by traffic totals. 3WDP does likewise at K4MC but complains of lack of outlets for southbound traffic, which indicates the need for more Virginia participation in 4RN. CHK, now Gen. Class, is NCS of the Southeastern Novice Net (3735 kc., Mon., Wed., and Fri. at 1700 EST). YHD, now back at M.I.T. and 1MX, says he worked 87 countries during the summer vacation from his home QTH in Loudoun County. LW is taking time out between issues of his *PB Virginia Bulletin* to build a new VFO and an all-band transmitter. JUJ has a new B. & W. 5100. CGE is trying new skywires to squeeze more out of 40 watts. JOS moved to North Carolina. KFC reports a mess of new plumbing atop a 50-foot pole. IF is complaining of skip snafu-ing VN. RJW says, "Back to the salt mines in mobile." YVG does music-making five nights, watch-repairing every night, yet keeps the rig mighty warm. Traffic: (Oct.) W4PFC 882, TFZ 138, K4MC 122, W4BLR 106, YKB 106, VYZ 72, YVG 70, KX 67, DWP 58, RJW 45, PCC 30, TYC 27, YZC 24, OLD 13, IF 9, LW 9, CKI 7, BYZ 5, BZE 4, ZYV 3, JUJ 2, ZFV 2, HJK 1, PYN 1. (Sept. corrected) W4PFC 740.

**WEST VIRGINIA**—SCM, Albert H. Hix, W8PQQ—USO has a new 20-meter beam. LXG has mobile rig on 40 meters. JUW is home from 5A3-Land and is at K4AF. HNC has a new rig with p.p. 810s at a kw. QHG has a new Ranger and is building new high-power final. KDQ has the new c.w. break-in system working well. GCZ got his 2nd-class telephone commercial ticket and is active on both nets. VCT should be back from Texas before too long. The following attended the Roanoke Division Convention in Richmond: GBF, JWX, PZT, BOK, NYH, CLX, and PQQ. NLT had a ham get-together at his home recently. PQQ was in Texas for a month. BK1 had DX as a guest recently. He is doing a lot of 2-meter work. ATF, now in Weston, will be on soon with new all-band rig. YPR, the SEC, has the AREC plan for this State worked up and it is urged that clubs get a copy of same in order to make final criticism and comments before it is printed and distributed. If any groups have suggestions and ideas as to what can be done to further organize for emergency operations, please contact YPR by letter as soon as possible. Tests are being conducted on 160-meter phone to determine what its possibilities are in being used for emergency communications. Traffic: WSAUJ 130, GEP 67, HZA 36, JWX 33, ETP 29, NYH 29, DFC 21, KDQ 3, HNC 7, LXG 5, PQQ 4.

### **ROCKY MOUNTAIN DIVISION**

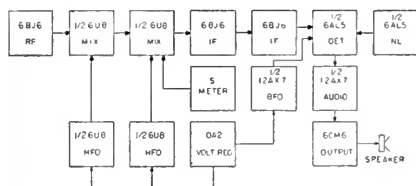
**COLORADO**—SCM, Karl Brueggeman, W0CDX—SEC: MMT. RM: KQD. PAM: IUF. Congratulations to KQD on her appointment as RM and to IUF as new PAM. KQD also was elected to the Pacific Area Staff as member-at-large. The new officers of the Ski-Hi Radio Club are DRY, pres.; OIB, vice-pres.; OXS, treas.; W. H. Kadesch, secy. 7QHF and family have moved to Alamosa from Phoenix. (Continued on page 102)





*Also Worth waiting for!*

## THE *Harvey*-WELLS BANDMASTER RECEIVER R-9



### T-90 MATCHING TRANSMITTER

90 watts — The Midget with the mighty punch! Same size as R-9 Receiver to make a complete Station in only one cubic foot. Factory built and tested and complete with tubes.

Price **\$179.50\***



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This is a double-conversion, super-heterodyne receiver featuring a high signal to noise ratio and sensitivity. The low frequency second I.F. stages provide high selectivity. Minimum frequency drift for phone and CW operation is assured by stabilization of the variable H.F. Oscillator, Fixed H.F. Oscillator and the B.F.O. This is accomplished by the use of temperature compensating capacitors and voltage regulation of the d.c. supply to the oscillators.

The circuits employed on all five bands consist of one stage of radio frequency amplification, a first detector and high frequency oscillator, one stage of 1600 Kc. intermediate amplification with another detector, and a stabilized high frequency oscillator. This is followed by two stages of low frequency intermediate amplifiers (260 Kc.) followed by a detector of the diode type, a noise limiter, a high gain audio stage, and the audio output stage. Automatic volume control, beat frequency oscillator, voltage regulator, and rectifier circuits are included.

The audio output stage provides a full five watts of audio which is sometimes needed in mobile or marine installations having high ambient noise conditions. The unit is designed to operate from either 115 V 60 cycle power, 6, or 12 volts d.c. An illuminated "S" meter and rear lighted lucite dial assure ease of operation.

A socket mounted on the chassis provides a mounting place for a crystal filter or a crystal calibrator which will be available as accessories.

Rigid steel construction affords reliable performance under the most trying conditions, such as marine and mobile installations where vibration effects become very serious. This performance packed receiver is packaged in a very small case measuring only 12 3/4" x 10 1/2" x 6 3/4" overall.

R-9 receivers have self-contained 115 V 60 cycle a.c. power supplies. For mobile or marine installations, 6 or 12 volt d.c. vibrapacks are available. No modification to the equipment is necessary for operation with 6 or 12 volt d.c. supplies.

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- Image Rejection: 30 to 60 db. from Band A to Band E.
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For example . . . as a Class C amplifier it will deliver output of 60 watts at 600 volts . . . 74 watts at 750 volts . . . 110 watts at 1000 volts . . . driving power is less than  $\frac{3}{4}$  watt in each case. And for higher-power use, output of 250 watts at 2000 volts, with 0.8 watts drive!

PL-6549 is an aligned-grid pentode, conservatively rated at 75 watts plate dissipation. Its quick-heating, 6-volt thoriated tungsten filament . . . its rugged construction . . . make it ideal for mobile applications.

The suppressor grid of the PL-6549 gives it excellent current-division characteristics . . . thus screen power requirements are very low. It offers excellent power gain and output, either as an audio or radio-frequency amplifier.

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Ariz. The Hi-Noon Net handled 231 messages in 18 sessions. WVZ is bucking the Rio Grande RR extra board and is home a lot working DX on 20-meter c.w. LZY will be keeping the same OBS schedules. They are Mon., Tue., and Wed. at 1200 noon on 7094 kc. Elmer is working nights and can't keep any net schedules. IA has a new Class B final that puts out about 100 watts. Gene reports that there still is no activity on the Colorado Army MARS. The Colorado Slow-Speed Net will be active this winter, meeting on Mon., Wed., and Fri. at 1715 hours on 3570 kc. K0WBB and W0KQD will alternate as NCS. The Fort Collins group has applied for affiliation with the League. The Club's name is the Trout Route Mike and Key Club. Our Director, IC, has prepared all the necessary paper work for the introduction of the auto license bill to the State Legislature. It is now up to all of us to contact the officials of our districts and acquaint them with the bill before it is introduced. If we all do our part, fellows, we'll get this through; so don't shirk, just work. Traffic: W0KQD 473, CYT 49, AMR 39, IUF 36, HOP 13, IA 9.

UTAH — SCM, Floyd L. Hinshaw, W7UTM — The UARC program for October embraced a discussion of s.s.b. which was very ably directed by JPN, OOK, of the Club's TVI Committee, gave details of its activities. The Club is conducting a drive for new members and expects a large increase because of the prizes being offered by NMK. SAZ is mobile with war surplus and junked car receivers. Bert uses modified vibrator pack for filament supply. His signals are very FB even if the gear is not "commercial." RQT is sporting a new all-band whip antenna. RPY and QDJ won the second transmitter hunt held by the Ogden Club. Six mobiles participated in the hunt. KUX has a new 10B exciter and is running about 500 watts on s.s.b. now. Ery also is active on 2 meters. VEX, VHV, WMM, and RVX recently received General Class licenses and are now heard almost daily on 75 meters. The Novice Net still meets at 2 P.M. every Sun. on 3735 kc. Traffic: (Oct.) W7PIM 141, UTM 10, QWH 2. (Sept.) W7QWH 5.

## SOUTHEASTERN DIVISION

ALABAMA — SCM, Joe A. Shannon, W4MI — SEC: TKL, RM: KIX, PAM: RNX. New appointments: TKL as SEC; DZF, WOG, and WOH as ECs; WOG as OBS. Welcome to the following newcomers at the section: KNAS AIW, ALL, and AIP in Huntsville; AJG in Tuscaloosa; AJJ in Childersburg; and KN4FMI and W4BHF in Tuskegee. S.s.b. is hopping in Birmingham with EBD, KNW, RKS, and YEG each striving to get on first. DFE, now has Old Timers Club certificate. WJX, ARR, and YYJ took in the YLRL picnic in Virginia and visited with KYL, SIB, CXL, and ZOI in Kannapolis, N. C. The Birmingham Club held a hot dog supper for members with about fifty turning out. The Montgomery Club is holding raffles of parts to raise money for a new club house. FMV does the honors as auctioneer. Transmitter hunts again are being held the 2nd Sun. of each month at 1400 on 3825 kc. HEK, in Northport, now has his General Class license and is making plans for a new rig to work 75 meters. OR reports that activity is increasing in Cullman and lists the following newcomers at St. Bernard College: BFT, GUR, and WNAs EFTO and HFZ. Welcome, fellows. Traffic: (Oct.) K4FDY 730, W4KIX 140, WJG 96, TXO 39, YRO 29, TKL 26, DXB 24, PWS 22, EJZ 17, OAO 14, OR 11, VIY 8. (Sept.) W4UHA 69, PWS 28, WHW 7.

EASTERN FLORIDA — John W. Hollister, Jr., W4FWZ — Birthday greetings to the Flamingo Net. In the October S.E.T. held near Palatka five ECs and 19 stations participated in a joint drill. The Miami S.E.T. brought out 45 stations. Thanks to ECs UHY, DVR, OBB, UHC, WEM, and IYT. A new net is the Transcontinental C.W. Net, on 3790 kc., starting at 4 A.M., with BMY as NCS. Use it to QSP the left-overs or to originate; it has very wide coverage. There will be plenty of net traffic for all at the State Fair at Tampa which starts Feb. 5th. The Novice Hurricane Net Bulletin (by YJE) is full of news about the gang. Get a copy. The NHN is going places. Ft. Lauderdale: FNR reports twenty 144-Mc. stations are expected as the result of renewed interest. AB, club station, uses Viking and NC-240D. PM says JZV, EUV, and ZUJ are using 20-meter VP beams. EC PPR turned out a good drill for the S.E.T. Jacksonville: The DCEN mobile gang meets Thurs. at 1931 on 29.0 Mc. and now includes 7 stations. The JARS sets up traffic-taking booths wherever they can. Key West: DRT finally got WAS. ELS reports a ham club on board at the NAS with 20 very active members. Merritt Island: FIQ reports new club officers are FIQ, FXH, and GED. Ken uses a Viking II, Miami: Here's a new wrinkle: The club auctioned off kits! IEH moved to Ft. Lauderdale. BSX, an Asst. EC, moved to Oklahoma. DRD got a Coast Guard citation for doing a good job with the Auxiliary Net. PBS has a 500-watt emergency generator for use with DEN work. The DEN has 36 active members on 29,044 kc. Clippers and compressors are being built like mad, says PBS of the gang. Ocala: That traffic booth at Silver Springs made BPL for DVR again. Orlando: We grieve with DQA in the loss of his jr. operator. BMY has p.p. 813s for a kw. on c.w. St. Augustine: WN4FJE

(Continued on page 102)

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60 countries in 4 months, says Leo, W4ERK, Miami

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40 Meter QRM no Bogey for Mel, W8GQY, Denver.

"...the 40 Meter (Vest Pocket) Beam has proven very satisfactory. We have not lost a single contact from being covered up with QRM. ...I think this beam is really worthwhile."

Expanded Ham horizon for Bill, W0RFC, Waverly, Ia.

"I am very well satisfied with my Mosley V-P Beam. I hear countries I have not heard with any other antenna in my 20 years as a Ham."

"Such good reports hard to believe", says Frank, VE6AC, Calgary, Alberta, Canada.

"...I have found it hard to believe my ears. My power input ranges from 22 to 50 watts ...yet my reports are, almost without exception, much better than those I am able to give. My Mosley V-P Beam (is) a joy beyond words."

"Outstanding results" for Whitey, W4PQ, Miami.

"...the performance and results obtained have been outstanding. W.A.C. and W.A.S. accomplished in a matter of days after the Vest Pocket Beam was installed, with many fine DX contacts."

Zed-L's say S-9 on 40 meter sig now, reports Nick, W0MUU, Salina, Kansas.

"Just a few lines to tell you how pleased I am with the (Mosley) 40 Meter Vest Pocket Beam. It is the best antenna, possible, for a city lot. It solved all my problems. I have been getting S-9 reports from New Zealand consistently. I have had several reports of 35 Db front-to-back. (I) do hope others will be able to enjoy the same advantages I have found."

Write for specifications and data sheets:

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Called stations answer Mac, W9CVQ, Wilmette, Ill.

"...I have found the Vest Pocket Beam highly satisfactory. Its power gain appears to be virtually equal to that of full sized beam antennas. I think I can summarize its performance by saying that when I call stations on the V-P Beam, they come back! Assembly of the beam was a straightforward, simple task in view of the clear instructions and color coding. I assure you I am well pleased with the MOSLEY Vest Pocket Beam Antenna."

and remember, when choosing Your beam—

MOSLEY 'V-P' Beams are made as small as possible, consistent with True Beam Performance. Element lengths are correctly proportioned to the loading coils to practically eliminate end-fire. Boom lengths and element spacings are such as to provide outstanding forward gain and front-to-back ratio with negligible SWR over a convenient bandwidth.

MOSLEY 'V-P' Beams are built up to high standards ...not down to a low price for false economy. Quality materials and good design assure Long Service Life and True Beam Performance. MOSLEY Beams for 20 and 40 are available NOW! A V-P Beam for 10 and 15 will be announced soon!

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Once you've used the PR-1 on your rig—once you've gotten the "feel" of the over-all band picture, send continuously—you'll never again want to feel your way without these eyes!

## FEATURES!

- Visual displays up to 200 kc. wide • 3-inch Cathode Ray Tube • Phone output for use of PR-1 as a second unisignal aural receiver • Cathode Ray Tube connections for use as external scope.



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says he lost his good antenna that really snagged the QSOs. At Ketterlinus are AGK, AGU, WN4FJE, and KN4AHA, a good group for EC UHC, St. Petersburg: With a sad heart we report the death of EYL, Tampa: New club officers are YIL, LAW, YFI, and ALP. Traffic: W4DVR 579, PJU 514, LAF 139, WEO 114, BMY 100, IYT 61, DRD 71, WS 47, TRN 34, RWM 255, FWZ 24, ZIR 21, DSC 18, FSS 12, FIQ 5, YV 4, WEM 3, YNM 1.

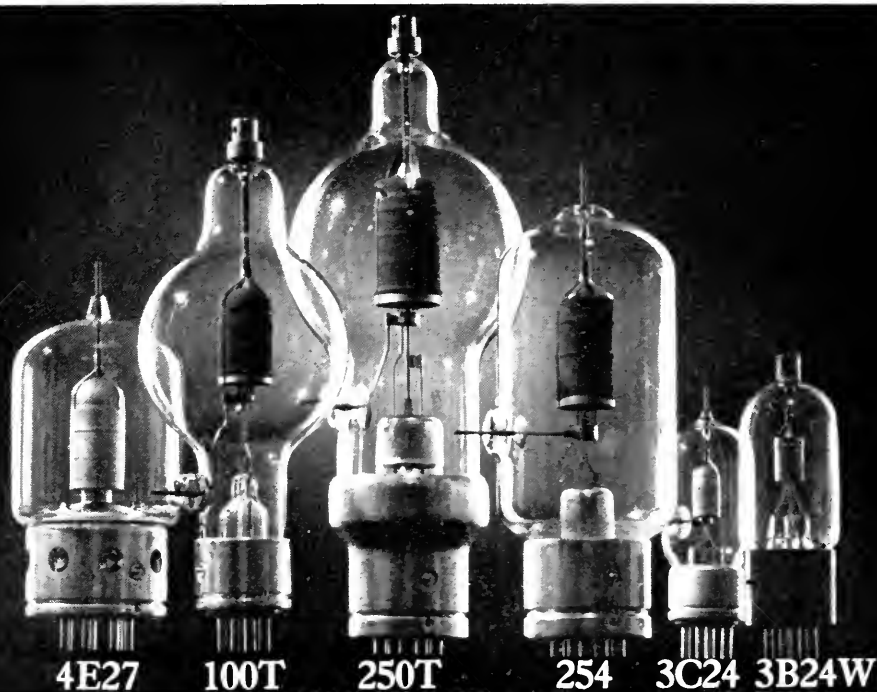
**WESTERN FLORIDA**—SCM, Edward J. Collins, W4MS/RE—SEC: PLE, ECs: HIZ and MIF, QK has a pair of 813s going on 75 meters. CCY is perfecting his mobile gear. JPD has put up 40-meter antenna for the winter season. TTM had transformer trouble with the HT-9. 9CPI/4 is enjoying 20-meter c.w. on the B. & W. HJA is looking at the s.s.b. unit for his B. & W. DAO/DEF is QRL with the club station. K4ALI, UYS, YRF, BGG, BBU, HBK, KN4AGM, and W4AYS are planning big things for the Pensy High School Radio Club station, K4AEF. GMS keeps weekly ssked with Pensy from Tallahassee. UUF keeps the 144-Mc DX stations jumping. KN4AEP is having transmitter trouble. MUX reports from Rome, Italy, while on vacation. OWN reports many early morning QSOs on 40 meters. EAR meets the gang on 10 meters. ZFL has FB vertical and gets out FB on 20-meter c.w. The gang wishes Mrs. UCY a speedy recovery. MS is working on linear amplifier for 10B exciter. WKQ worked 303 in 54 sections during the CD Party. CPE has a new converter in the car. ROM is back on 10 meters. RKH has the monitor for 10 meters going full time.

**GEORGIA**—SCM, George W. Parker, W4NS—SEC: OPE, PAMs: ACH, LXE, RM: MTS, OCG, Nets: Georgia Cracker Emergency Net meets on 3995 kc. Sun. 0803, Tue. and Thurs. 1830 EST; Georgia State Net (c.w.) 3590 Mon., Wed., Fri. at 1900. New appointments: IKK as OES, CFJ and FZO as OPS. The Atlanta Radio Club has a new meeting place in the Red Cross Building on Peachtree St. Meetings are held the first Thurs. of each month at 7:30 p.m. All Atlanta hams and visitors are invited to attend. KN4ANZ now is on in Moultrie. FGH, of Quitman, and CFJ, of Atlanta, are building on TV stations. BXV has a new 348-R. OCG reports that the c.w. net is picking up; he still needs more Georgia outlets and more Georgia traffic. IKK, in Rome, EUK in Marietta, KGD in Dahlonega, and CFJ in Atlanta, are getting rigs on 420 Mc. IKK wants to hear from anyone who would like to try for Rome on 220 or 420 Mc. WN4HYV, the XYL of OGG, is on the Novice bands in Augusta. YRX, active on 75 meters in Warner Robins, is looking for traffic. K4WBP operated from the Southeastern Fair this year. FZO got 32 states on 40-meter 'phone in October. LXE has a new mobile rig. IPL is rewiring his mobile for a new 12-volt car, and is moving his home rig into a new pine-paneled shack. The Macon Club meets every other Mon. at the City Hall. All Macon amateurs and visitors are welcome. WKP is getting a new mobile from Santa this year. Thanks to the club secretaries and others for all the news this month. Happy New Year. Traffic: K4WAR 1171, W4OCG 285, YRX 166, IMQ 140, K4WBP 127, W4BWD 107, WN4HYV 76, W4ZW/T 63, MTS 44, NS 22, MA 11, FZO 3, BXV 2.

**WEST INDIES**—SCM, William Werner, KP4DJ—SEC: HZ, ZW received ORS appointment. DV renewed ORS, OBS, and OO appointments. WD and MS have Tel Rex beams on 20 meters. RK built a short beam for 20 meters. WR has a 300-watt Eldico on 15 meters. The PRARC meets at the N. G. Officers Club the first Tue. of each month. ZV is ex-W4KZT, W6PXC, DL4XD. WF sends greetings from the U. of Miami; WXC sends greetings from the U. of Maryland. KD worked HI6TC for No. 209. ES, CI, BI, and EE loaned the Ponce c.d. their Gonset Communicators when c.d. equipment failed during the floods. The first 2-meter contact from Red Cross station ID was with AAN and CX, using Gonset Communicators. AC and PK are using 430 Mc. ID will call the roll of the P. R. Emergency Net at 7 p.m. AST because of skip at 8 p.m. on 3925 kc. The Antilles Net, YX NCS, meets at 7 a.m. and 6 p.m. on 3865 kc. OOs DV, KD, and RL qualified in the September F.M.T. 2-meter activity in the San Juan Area now includes VX, CX, HZ, DV, EA, JM, and AAN, all using Gonset Communicators. HN uses a Millen 75-watt job; the frequency is 145.26 Mc. MV built a copy of the Tel Rex beam for 20 meters. K2BLN and W3IOU visited KP4-Land. YX has new 75A-3 receiver. W4DKW now is ABC. W7SVJ/KP4 and W8DRT/KP4 are on 75 meters. KH6ABS/KP4 is on 20-meter c.w. AAO is a Navy 'copter pilot. ML is back from stateside military training. ZN was sent a 100-signature scroll from Rosario, Argentina, thanking him for sending a vitally-needed drug that saved a lady's life. QA sent reports to a Colombian amateur station on their team's progress in the international bicycle race here. PRARC's Work KP4 Contest will be held in January. Traffic: KP4ZW 5, GP 3, RK 3, ZD 1.

**CANAL ZONE**—SCM, Roger M. Howe, KZ5RM—WA replaced RM as SEC. DG is the new PAM, and DE and GF continue as RMs. GF finally got that hundredth card. W5FJA spent a week here as the guest of WA and had a fine time. He even had the privilege of seeing those "mad beam erectors," the washer crew, in action at GF's QTH. DG and KA are "witches" No. one and six, respectively, and handle quite a bit of traffic for the Maritime Mobilers  
(Continued on page 106)

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on 15 meters. Ex-KZ5BL, now K4AEE, is on the air at Miami Springs, Fla. Your former SCM, NM, has been very ill but is improving daily. For a while FL, DG, and XYLLM were keeping daily skeds with W5TAF to report on his condition to his family. DL6NU was in town and attended the monthly meeting of the CZARA, which was held at the home of club proxy, RV. The CZARA station, KZ5JW, is on the air with a Viking I and NC-125. Traffic: KZ5WA 57, KA 5, RM 2.

### SOUTHWESTERN DIVISION

**LOS ANGELES** — SCM, Howard C. Bellman, W6YVJ — Latest happenings include the appointment of Hank Garman, 6BHC, as Assistant SCM, with Bill Schuch, 6CMN, taking over Hank's job as RM of SCN. The last Traffic Breakfast of the year was held at Clifton's again and BHG was the chairman. The next meeting will be held in January. The following qualified as Class I Observers in the September F.M.T. in order of accuracy: AXV, LIY, RW, NKT, MUR, MSG, CK, ENR, and K6FA. Although not qualifying, K6HB also took the test. Included in the *Oscillator*, the magazine of the Associated Amateurs of Long Beach, are two pages of "Cures for TVI Caused by Fundamental Blocking." SCW, scoutmaster, informed me that his Explorer Post 177, sponsored by the Whitney High Handicapped School, has a radio unit with a 300-watt, 20-meter layout. The financial backing comes from the Studio City Rotary Club. One of the Explorers is KN6IC1, of Canoga Park. Ages run between 14 and 18. Bob, the scoutmaster, used to be 7MIQH. NCP was visited by K17ANT, ex-W6ZEV. LVQ reports that the Whittier 50 Club had seven mobiles patrolling the city on Halloween at the request of the police. The boys also participated 27 hours in the S.E.T. in Whittier. LDR is running 1 kw, now and says he is sporting a new 20-meter beam. ORS tells of a rig blowing up at UID/6 while mobile on 2 meters. LYG is bragging about his Viking Ranger. He now needs outlets in Santa Ana and Newport Beach on 2 meters. K6BEQ is trying to form a 40-meter net. For details see K6DDI and/or K6EZM. Walt went bike-mobile with a buzzer and worked a mobile. LPE, of K6FCZ, wants to start a 20-meter net on 14,260 kc. Dave Wersen, K6CV, announces that the Frank Wiggins Radio Club, YAS, is a member of the Council of Radio Clubs in Los Angeles. K6DIM and CV are delegates to the Council while KPQ is alternate. New officers at the Club include K6DIM, pres.; KN6EBJ, vice-pres.; IPS, secy.; K6IDW, treas.; K6IDX, sgt. at arms; KPQ, station mgr.; and K6CV, sponsor. The members will accept traffic from 1600 to 2200 Mon. through Fri. on 14.1 Mc. Traffic: (Oct.) W6LYG 648, K6FCZ 542, W6CMN 384, K6FCY 278, W6FMG 180, GYH 94, NCP 94, USY 64, BHG 46, CK 24, K6BWD 22, DQA 17, W6ORS 16, K6BEQ 13, W6DWP 13, F1 13, NTN 11, K6COP 6, KN6HOV 6, W6LVQ 6, AM 2, PZN 2. (Sept.) K6FCZ 1063, DQA 89, W6GYH 86, GJP 27, PZN 6. (Aug.) K6DQA 84, W6GYH 50, PZN 10. (July) W6GYH 30.

**ARIZONA** — SCM, Albert H. Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH; Dr. John A. Stewart, 7SX. SEC: VRB, PAM; KOY, Arizona 'Phone Net: Tue. and Thurs., 7 p.m., 3865 kc. Arizona C.W. Net: Tue. and Thurs., 8 p.m., 3690 kc. In accordance with the recent policy of our new SEC, VRB, of having the ECs in various sections around the State sponsor alerts, October saw the AREC in action in a statewide "Operation Car Count," sponsored by Tucson, with LAD, local EC, in charge. The purpose of the alert was to spot mobiles on the main highways leading to and from Arizona communities; to count all incoming and outgoing vehicles; to report same to a local fixed control station, which in turn would relay this information to headquarters at Phoenix. The alert was a huge success, thanks to the following ten fixed and mobile stations located in ten communities around the State: BFA, CDQ, DRQ, HUV, IRX, KUJ, LAD, LHF, LND, LVR, MQE, MVV, MWD, NYT, OEE, PJY, PSH, QHD, QHT, RBA, REO, ROZ, SQX, STQ, TJT, TNY, TOA, UCA, UCX, UNL, UXK, VRB, VVJ, 6SBK, K6BAW, and KB6AN. RUX received MARS appointment. ULP and VAG got General Class licenses. TVJ is new EC for Douglas Section. 5BDB/7 is moving back to Dallas. VOZ is back from Alaska. VRB won a Worked All Tucson (WAT) certificate. Traffic: W7LVR 15, RUX 8.

**SAN DIEGO** — SCM, Don Stansifer, W6LRU — Asst. SCMs: Tom Wells, 6EWU; Shelley Trotter, 6BAM; Dick Huddleston, 6DLN. SEC: VFT. ECs: BAO, BZC, DEY, DLN, HFQ, HRI, IBS, KSI, KUF, and WYA. RM: ELQ. K6DBG, OBS, in Santa Ana, now is putting out bulletins on 145.3 Mc. Mon., Wed., and Fri. nights. The Rohr Club is giving instruction on Tue. and Thurs. for beginners in both code and theory. K6DBG is building a Ranger Kit. GBG tells the gang to try 21 Mc. more often with good openings from sunrise on noted. The Orange County gang went all out in the recent S.E.T. with 33 stations participating. The AREC in San Diego County held a very successful S.E.T. on 75, 10, and 2 meters with the majority of its members participating. The organization was much better than last year, and the speed of traffic-handling because of frequency allotments was noted. GBM passed his exams for Naval Air Cadet. K6HKX is a new amateur in Santa Ana.

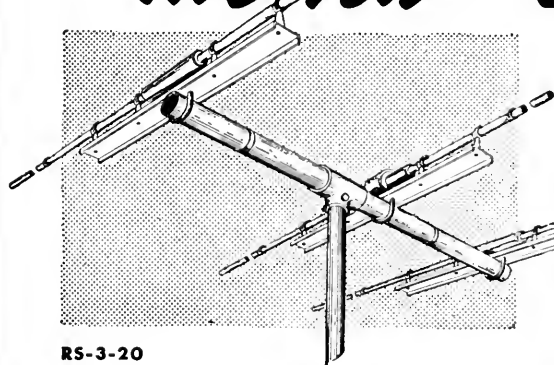
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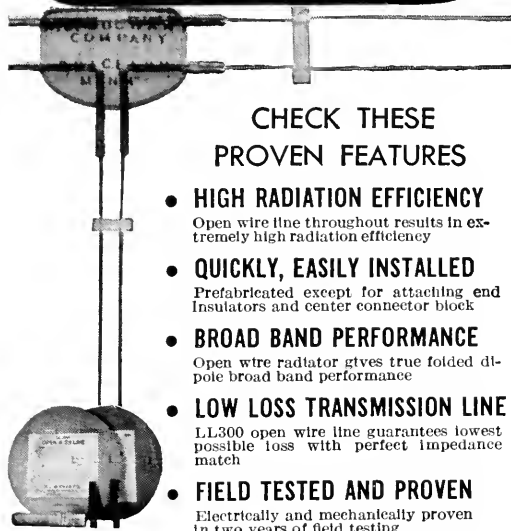
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MGT is chasing DX, and is up to 50 countries. Nine San Diego DX men attended a DX meeting at the home of LRU in November. We are glad to note more activity in this field locally, which should have more representation DX-wise considering the number of active amateurs. For information on meetings, contact LRU or BZE. KN6DVF has a new HQ-140. K6BEC has an LM frequency meter now. K6CUZ has a new VFO and 33-foot vertical, and swears he might work out of the State now. The Convair Club is very successful with its classes, and many are taking their Novice and General Class exams as a result of the knowledge gained attending this worthwhile activity. Happy New Year and good hunting in 1955. Traffic: W6IAB 3028, IZG 538, YDK 439, KYB 207, ELQ 169, K6DBG 38.

**SANTA BARBARA**—SCM, Vincent J. Haggerty, W6IOX—The traffic report from K6NBI by radiogram was delivered by JPP. K6CRJ reports of 2-meter signals from Santa Maria being heard in Santa Barbara, which constitutes an extensive "over the hills" jump. IID is building an amplifier to go with his 20A s.s.b. exciter. FYW is active on CARS and runs skeds with JFP on 145.8 Mc. Art Monsees, HJP, reported from Offutt Air Force Base in Nebraska to say he will be locating his antenna system in the Santa Barbara Area one of these days. Members of the section are reminded that it is time to be considering a replacement for the present SCM, who wishes to retire at the end of his term. Traffic: K6NBI 121, CRJ 7, W6FYW 2.

## WEST GULF DIVISION

**NORTHERN TEXAS**—SCM, T. Bruce Craig, W5JQD—SEC: RRM, PAMs: IWQ, PAK, RMs: PCN, QHL. The Dallas Amateur Radio Club had an interesting program on Transistors with a movie on "The Atom Goes to Sea" as part of the Nov. 22nd meeting. A new Novice in Dallas is WN5HHK. Our Vice-President, NW, has every QST since the beginning except Jan. 1943. K5FBE reports the BC-610 is back on the air with 3-band vertical. JLT reports the visit of a Navy buddy, 01GP, recently, the first time since 1945. SYL reports as one of the operators at the Dallas Fair where 200 operators made over 2000 contacts and handled 308 messages. PTK has completed the 300-watt rig, complete with VFO power supply, speech amplifier, etc., all in 8 3/4 panel. He uses a 4-125A final with a pair of 811A modulators. KVA is completing the kw. rig with 4-400, 100TH modulator, and power supply all in a 17 1/2-inch panel space. DYU reports as one of 55 amateurs in the Fort Worth c.d. test on Oct. 31st. Sixteen mobile units were employed and 25 "handy-talkie" units. CVA headed the Fort Worth amateurs. YIJ, at Marlin, is handling traffic for vets in the hospital there. The October SEC report shows a gain to 311 reporting stations. The Terry County Amateur Radio Club has been issued the call HPI. The club (NFO, pres.) has 30 members and meets the 1st and 3rd Tue. of each month. SNX, OES, reports a v.h.f. meeting was held in Brownfield on Oct. 23rd with 50 present. Fellows, please have your club secretary send in a postal card with activities to your SCM. The v.h.f. boys are making progress and we are still hoping to get a complete link of 2-meter operation across the entire northern half of Texas. Traffic: W5TFB 638, K5FBE 548, W5YPI 207, AIC 172, KFB 162, PAK 121, UBW 63, UFP 54, ACK 47, ZWR 33, CF 30, SYL 24, TPT 21, RRM 18, DYU 9.

**OKLAHOMA**—SCM, Dr. Will G. Crandall, W5RST—Asst. SCM: Ewing Canady, 5GIQ. SEC: KY, PAMs: PML, SVR, ROZ, RM: GVS. While on a Goodwill Tour of the South American countries for the Federal Department of State, Governor Murray of Oklahoma kept in regular touch with his office in Oklahoma City by means of amateur radio via GZK. The North Fork Amateur Radio Club of Western Oklahoma obtained excellent state-wide publicity on its Simulated Emergency Test on Oct. 17th with very favorable editorial comment in the *Greer County News of Mangum*. Publicity of this sort should be the aim and object of every amateur and amateur group as it amply justifies the retention of amateur frequencies for public service. KY, as SEC, has definitely enlivened the State for AREC by appointment of many new county ECs and is holding a weekly EC round table following OPEN on Sun. morning. The Will Rogers High School Amateur Radio Club has been organized with 15 members and has the club call ETJ. Officers are DCC, pres.; CEG, vice-pres.; DCA, secy.; WN5DBZ, treas.; and ZWT, trustee. Newly-elected officers of the Enid ARC are GIQ, pres.; PCQ, vice-pres.; KWF, secy.-treas.; REC, asst. secy.; WN5HBL, custodian. A new code class also has been started. Many thanks to those sending in news and traffic reports. Traffic: W5MRK 192, PML 35, SVR 32, SWJ 25, FEC 23, AIQI 20, QAC 20, KY 17, TNW 16, RST 15, ADC 14, WSM 12, EHC 10, TC 9, REC 8, VAX 8, MFX 7, PAA 5, PNG 5, BYC 2, WTA 2.

**SOUTHERN TEXAS**—SCM, Dr. Charles Fergagh, W5FJP—ZIH, MRV, and RP11 detected a faint c.w. signal on 75 meters from RES mobile in the hills of New Mexico. His car was broken down "60 miles from nowhere." They made a long distance call to Hobbs, N. Mex., and had repair parts taken to him. New officers of the Temple ARC: VLF, pres.; VRN, vice-pres.; WDW, secy. The TARC is sponsoring a local mobile emergency net. Drills

(Continued on page 110)

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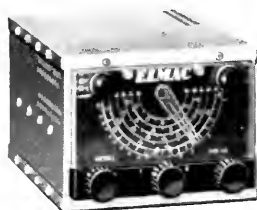
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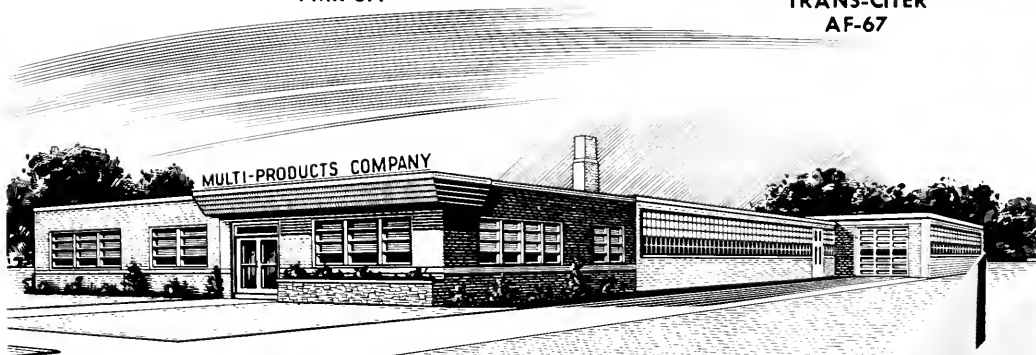
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are held Tue. at 5:30 P.M. on 3855 kc. PNP is NCS. UPO and VLF are now mobile. VRN found the hidden transmitter at the Oct. 24th family picnic. AET, Hidalgo County EC, reports a considerable amount of activity on the border. The Rio Grande Valley staged the 1st Red Cross simulated disaster just a few weeks before the recent flood. FZO, control station for STEN Zone 4, and member of TSG and MARS, has a kw. power unit for emergency work. The RGARC in Edinburg is doing an FB job and many new amateurs will be heard in the near future. The boys in Harlingen have organized a new club and had a transmitter hunt in cooperation with the Harlingen AFB amateurs. SZB found the transmitter and AET was second. The Rio Grande Valley has organized a motorcycle corps of Boy Scouts, industrial mobiles, USNR, National Guard, State Guard, Border Patrol, amateurs, etc. SZB reports from the RGARC. AET changed his mobile loop to a center-loaded whip. YDI has a new mobile. SU is putting up a new 15-meter beam. BRD is on 40-meter c.w. working DX. TVL is back with a new rig. WN5BWT took the Tech. Class exam. CRA has a new B. & W. transmitter. AUO has a new mobile converter on all bands. VIT has a new TCS. NVQ has a new 813 rig on the air. MBU has a new low-drain emergency rig. FZO has a vertical on 75 meters and a 40-meter vertical beam. PAR is operating on *Padre I*, with a kite antenna. PBU is building a new shack. BYI has a 40-meter beam which is a pair of 40-meter dipoles fed 135° out of phase. GLA has an 11T-9 on the air. Mary Ann reports the GCARC club house is coming along FB. YDO is spraying it. OGG is giving code lessons. AUN is looking for a pair of 813s. VUS is putting up a vertical for his 813. Gateley is now WN5HWS. Devaney has been racking up a lot of DX with a new ground plane. BPF also is doing FB with DX. DJD is decorating the club walls with QSL cards. OGG is custodian and trustee of the club transmitter. URU has been elected to the board of directors of the HARC. FJF, recently in Washington, passes along 73 from Mr. and Mrs. George Ashenden, formerly of the F.C.C. office in Houston. JQ made all-40-meter c.w. WAS. IUU is operating mobile. The HARC is conducting a drive to raise funds for a new club house. Traffic: W5MN 1089.

**NEW MEXICO** — SCM, G. Merton Sayre, W5ZU — SEC: KCW, PAM: BIW, V.I.I.F. PAM: FPB, RM: JZT. The NMEPN meets on 3838 kc. Tue, and Thurs. at 1800. Sun. at 0730; NM Breakfast Club every morning except Sun. 0700-0900 on 3838 kc.; the NM C.W. Net daily on 3633 kc. at 1900. GEM has taken NCS for NMEPN until BIW gets the big rig back on. On Oct. 9th WBJ, THA, UDM, GEM, EDN, OME, BIW/DRA, and 1RII/5 helped out with "Seaborn Collins Day" at Las Cruces. The Tularosa Valley ARC's new officers are JMM, pres.; DVA, vice-pres.; FVV, secy-treas.; ORP, program ch.; DGR, station mgr.; Lou Oliver, pub. mgr. The Caravan Club is very active in the Albuquerque Area. SUC won the award for the most outstanding Junior Amateur in the West Gulf Division at the Kerrville Convention. RFF won the V.H.F. Award for New Mexico in West Gulf competition. AYU in Texas, and SCX in Oklahoma. VWU has worked 7VMP in Phoenix on 2-meter c.w., and has been copying meteor scatter from 4HHK. He now has 32-element 2-meter beam operating. FAG also copies VMP. HZC, IIZG, HZH, and HZP are new Novices in Albuquerque. In the Sept. 16-17 F.M.T. the following average errors in parts per million were made: QHK 5.7; BIH 13.0; GRI 40.3. This qualifies them as Class I Observers. Ruidoso in 1956! Traffic: W5ZU 115, WPA 40, AQO 35, HJF 33, BXP 13, ZSL 10, GEM 7, WBC 6, CEE 5, QR 5, UTS 5, ZGG 5.

## CANADIAN DIVISION

**MARITIME** — SCM, Douglas C. Johnson, VE1OM — Asst. SCM: Fritz A. Webb, 1DB. SEC: RR. PAMs: VE1OC, VO2AW, VO6N. ECs: VE1DQ, VO2G, VO6U. RM: VO6X. New appointees are VE1HJ as RM, W7SNR/VO6 as OPS. HJ reports formation of the Maritime Provinces C.W. Net (MPN) which meets on 3570 kc. daily except Fri. and Sun. at 7:15 P.M. AST. Give this net your full support. We regret the passing of FJ. Back home to the Halifax Area are ex-VE1EP (VO6EP) and ex-VE1HT. OC is active on 14- and 21-Mc. phone. PB is signing portable VO2 from Torbay. A recent visitor to Halifax was VE6HM. During Fire Prevention Week FRAC members set up club station VE1ND for exhibit and operated 75 meters. EC VO2G reports 7 AREC members in the Gander Area and hopes for a permanent club station set-up soon. VO2JH is rebuilding the station, including the winding of his own power transformers. W4KVM/VO6 is active on all bands. W1UBW/VO6 transmits Official Bulletins regularly. VO6N is getting good results with 4-65A final. VO6X is QRL with bartending. New calls at Goose are VO6Q and VO6AB. Traffic: (Oct.) VO6N 409, VE1EQ 176, VO6U 135, VO3AH 59, VO6S 51, VE1UT 39, VE1ME 28, VE1OM 22, VE1OC 18, VE1HJ 12, W4KVM/VO6 7, VO6X 5, VE1DB 1. (Sept.) W4KVM/VO6 5.

**ONTARIO** — SCM, G. Eric Farquhar, VE3IA — Thanks are extended to all hams who assisted in emergency work during Hurricane Hazel. NG and NO are this section's

(Continued on page 112)

**Your Rig is only as effective as the Antenna you tie it to!**

$$\begin{aligned}\frac{\partial(e_3 E_v)}{\partial v} - \frac{\partial(e_2 E_v)}{\partial w} &= -j\omega\mu_2 e_3 H_w \\ \frac{\partial(e_3 H_w)}{\partial v} - \frac{\partial(e_2 H_w)}{\partial w} &= j\omega e_3 e_2 E_v \\ \frac{\partial(e_2 E_v)}{\partial u} - \frac{\partial(e_1 E_v)}{\partial v} &= -j\omega\mu_1 e_2 H_w \\ \frac{\partial(e_2 H_w)}{\partial u} - \frac{\partial(e_1 H_w)}{\partial v} &= j\omega e_2 e_1 E_v\end{aligned}$$

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1000° of bandspread  
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latest members of the Brass Pounders League. DFE gave his antenna system its annual pre-winter overhaul. AEH and BMV have completed mobile installations. DRE has an antenna rotor. AXZ, at Carnat, operates a Mark Nineteen set on batteries. DLN is trying hard for Class A. AIG, who visited VE2FL and OB recently, hopes to be working mobile soon. There was an uplift in 10-meter activity in October. The Hamilton Emergency Radio Corps gave fine demonstrations at home and school association of the Prince Philip School. BSW covered 3300 miles on his vacation trip to the Deep South. NN gets good reports on 10-meter f.m. mobile. The Quinte Club held a successful auction. VZ, manager of OSN, which operates nightly on 3535 kc, solicits your traffic. AJR contacted WSRP/VE3, who was mobiling in the Windsor Area and piloted him and his family right to her festive board. Up Kapuskasing way AVS has formed a northern net in an effort to provide coverage to northern Ontario and Quebec and to provide traffic-handling experience for amateurs situated in the Bush Country. The Net operates twice weekly at 1915 EST Mon. on 3680-kc. c.w., and Wed. on 3755-kc. 'phone. Newly-elected officials of the West Side Radio Club of Toronto are AYO, pres.; IZ, vice-pres.; AIB, secy. At the helm of the Mohawk Radio Assn. we find CC, pres.; DQU, vice-pres.; BLT, secy. This club has a fine 2-meter mobile program well under way. The Hamilton Amateur Radio Club officers are CJM, pres.; IQ, vice-pres.; DFE, secy. BNQ is editor of the club's monthly bulletin. Traffic: VE3NG 260, NO 220, BUR 129, BJV 126, AJR 113, VZ 94, TM 87, ATR 82, GI 82, AUU 73, DQX 61, AOE 45, CP 37, DFE 14, AVS 5.

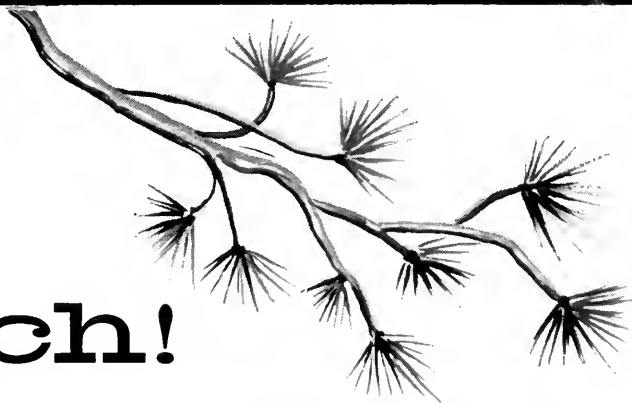
**QUEBEC**—SCM, Gordon A. Lynn, VE2GL—WW has five-element beams on both 20 and 15 meters, also a six-element beam on 10 meters, and placed guys on the supporting mast after Hurricane Hazel! JR has 120 watts on 20-meter 'phone with a two-element beam. PZ has 500 watts 'phone on 20 meters. APH is using three-element beam on 20-meter c.w. AAO took part in the Frequency Measuring Tests with gratifying results. EC reports with regret the death of XV. VE1YW now is VE2ANK. AM and VA are newcomers in Victoriaville. AUH is on 3.7 Mc. from Forestville. ACS, LE, and AME are now operating VE2CL, the club station at Laval University. KG has completed walkie-talkie and gave it a workout during the C.D. Test and is converting the home rig from 814 to 833A. PL reports formation of the Northland Net on 3755 kc, at 1915 hours Wed. with 13 reporting stations, all members of AREC. ZZ visited several of the boys in Trois Rivières. AON has flea power on 75 meters. ADK has had the call changed to IQ. UQ, formerly VE3DPG, has Command transmitters on 80, 75, and 40 meters with 1155 receiver. H again is active with battery-operated equipment from his summer place at Wallis Lake, with 175 watts c.w. on 80 and 40 meters and Elmac AF-67 on 'phone with S-76 and NC-240D receivers from Sherbrooke. AGG now has the big rig operating from Drummondville on both c.w. and 'phone. CP has been appointed alternate PQN net control and EAN liaison TRN Wed. DR reports conditions poor with net work difficult. Traffic: (Oct.) VE2DR 104, GL 32, EC 25, ATQ 10, FL 9. (Sept.) VE2EC 21.

**ALBERTA**—SCM, Sydney T. Jones, VE6MJ—XG has been appointed Route Manager and is in the process of organizing a new net to be known as the Pipe Line Net on a frequency of 3620 kc. This net meets daily except Sun, at 1930 hours, and will have outlets to OSN, WSN, RN7/VE7, and the Polar Net. Harry is interested in hearing from all who may wish to take part in this net activity. AL is a new ORS. OS is a new OBS. HMI has returned from a visit to Halifax. A new radio club has been formed at Coaldale with AM, pres.; CK, vice-pres.; and TS, secy.-treas. WC reports he will have to rebuild to get away from TVI. The Northern Alberta Radio Club has code classes under way on 3687 kc, on Mon., Wed., and Fri. at 1930. Comments regarding reception would be appreciated. Calls of the code practice stations are 6CE, 6WR, 6YP, and 6ZR. Your SCM will welcome applications for any of the ARRL appointments. Emergency Coordinators are needed in all the larger centers in Alberta. Traffic: VE6HM 47, OD 22, WC 8, YE 8, MJ 7.

**BRITISH COLUMBIA**—SCM, Peter McIntyre, VE7JT—Congratulations to ASR, who was nominated by the W group of RN7 to take over the management of the RN7 traffic net. As he has accepted, your cooperation with Whitey would be appreciated by him. Also congrats to AV upon winning the BCARA Trophy Cup. Denny Readville has been untiring in his efforts in amateur affairs and has been president of the BCARA for three terms. Both he and his capable executive have just been reelected for another term. Others who had been nominated for the BCARA Trophy were FY, QC, JB, US, and XW, all of whom have contributed to the betterment of amateur radio in one form or another. The thanks of the British Columbia amateurs is extended to them for the work they have done in their individual fields for amateur radio. A new revised edition of the *Amateur Radio Telephone Directory* is being revised and brought up to date as soon as possible and the listings will be as of the latest DOT address listing, so if any errors in QTHs are made you didn't get your change of address in soon enough for the "Book."

(Continued on page 114)

# new branch!

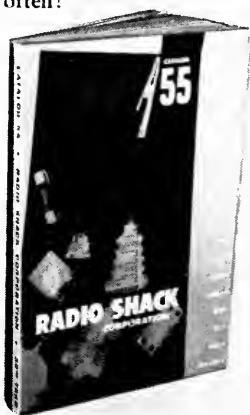


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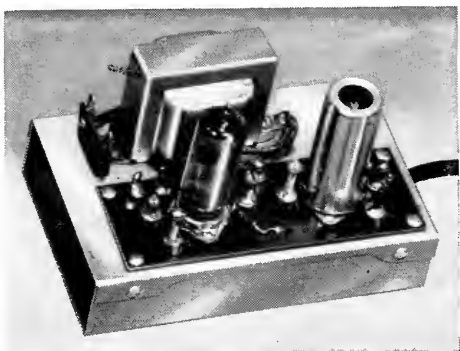
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Additional Details in *CQ Magazine*: Page 32, Dec., 1953



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AQS and his XYL have left for the Barbadoes. The Island seems to be having a surge of mobilitis, with more reports of fellows going mobile. The interior gang wants to start a 2-meter net. Anybody want to start the ball rolling? Traffic: VE7TF 118, QC 70, DH 39, KL 27, ZV 19.

**MANITOBA** — SCM, Leonard E. Cuff, VE4LC — NW has been doing some experimenting recently and finds that using a lamp bulb as a dummy load is just the thing to work up to 50 miles on 75 meters. GY, the Air Force Club station, has been heard again on the 75-meter band putting out a big signal. AY, at Haskett, is being heard again after a long lay-off with a very good signal. YR has moved to a new home in the same locality. AP is reported to have been visiting AI at Binscarth. AN is a new one on 75-meter 'phone. KG went hunting in the Dauphin Area but did not report what he was hunting or what success he had. HL paid one of his periodic visits to Winnipeg and informs us that he has new antennas on 80, 40, and 20 meters. AI is a frequent visitor to Winnipeg these days. The Manitoba C.W. Net is in full swing on 3700 kc. daily at 1900 CST. Anyone interested in the c.w. net, please contact HL, the RM. The NCSS for this Net are AZ, KL, and KN. Those of you who wish to keep up to date with the ARRL Official Bulletins should tune in to JM, who is an OBS and may be heard at the following times on 3760 kc.: Mon., Wed., and Fri. at 1830 CST, and Sun., Tues. and Thurs. at 1230 noon. Traffic: VE4AI 33, GE 19, EF 17, HL 14, KG 7, RB 5, GB 4, QD 4, NW 3, JW 2, MK 2, MO 2, WS 2.

**SASKATCHEWAN** — SCM, Harold R. Horn, VE5HR — CW reports from Regina that local AREC members had a good workout in the Oct. 9-10 Simulated Emergency Test. JK, JW, GH, RH, HA, DM, DP, ZZ, and CW, as control station, made 112 points. Besides the home stations 1 mobile and 2 walkie-talkies were used. New officers of the Regina Club are CW, pres.; TS, vice-pres.; HA, secy. The Club visited the local TV station and gained considerable knowledge but no equipment. OC is on a new shift and should find it better for chasing the rare ones. EO is now on 'phone and is a new member of the 'phone net. HJ has moved to Lloydminster; GK also is a new ham there. JZ is new at Pelican Narrows. 5RE did better than the VEOs, getting 100 per cent check-in on their 'phone net. TH is in VE3-Land for a few months. RC took unto himself an XYL. FY says amateur frequencies are poor at Uranium City. YF is heard occasionally between home and school meetings. DN advises that activities at Prince Albert are at a low ebb. JO and DA work 21 Mc. with good results. The XYL of MV presented him with a young YL. Traffic: (Oct.) VE5HR 28, DS 22, CW 17, DR 14, FG 13, RE 12, BF 10, GC 10, BZ 8, JN 8, GX 6, LU 6, GO 2, KG 2, QL 2. (Sept.) VE5DS 29.

## Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1GWA, Thomas J. O'Brien, South Windham, Me.  
W2JQI, Harry C. Condon, Albany, N. Y.  
W2VDM, Harry Green, White Plains, N. Y.  
W2VZ, Samuel Woodworth, Jordan, N. Y.  
ex-W3AWT, A. A. DeVine, Palo Alto, Calif.  
W3ME, Charles Robert Sherrer, Baltimore, Md.  
W4EY1, Wilton C. Spence, St. Petersburg, Fla.  
W4WHG, L. O. DeLonchaw, jr., Bellflower, Calif.  
W6FTH, William Race, Sherman Oaks, Calif.  
K6GLO, Thomas T. McCoy, Oakland, Calif.  
W6GPN, Richard G. Cowell, Sacramento, Calif.  
W6LLJ, Damon D. Barrett, San Francisco, Calif.  
ex-W6YEZ, John C. Leo, San Mateo, Calif.  
W7KTD (ex-W6MBN), Harry J. Henke, Portland, Ore.  
W8DWB/WSKTD, Ralph H. Babcock, Cedar, Mich.  
W8FWK, Virgil E. Farrell, Hamilton, Ohio  
W8JRS, Lawrence T. Johns, Aurora, Ohio  
W9MDO, Dr. Worrall S. Kelly, Chicago, Ill.  
W9PZM, J. Michael Murphy, West Lafayette, Ind.  
W9BDO, Bud Crawford, Broken Bow, Nebr.  
W8CPA, Graham C. Dodge, Denver, Colo.  
VE2LP, Luc Bernier, Ville Lemoyne, Que.  
VE3DCE, Russell Sudden, St. Catharines, Ont.  
EI9T, Rev. Fr. P. Macartney, Dublin, Eire  
PZ1AL, Eugene Van Leeuwaarde, Paramaribo, Surinam



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## Auroral Propagation

(Continued from page 16)

visible portion of such formations, but one might expect that a good returned signal could be obtained from the ends of the arc which appear near the horizon. The rotary Yagi showed, however, no signals coming from those directions. This is another case of no signal coming from the brightest part of the visible aurora. This is in agreement with Figs. 7 and 8, showing that signals are rarely observed in the east or the west, but only in the northern quadrant.

V.h.f. auroral radar echoes have been studied at several other places in the northern hemisphere, where the above-described large ranges and restrictions of the echoes to the north have also been found. At most locations, however, the visible aurora has occurred predominantly at large distances from the observing site, and so the radar results were to be expected. For example, at Ithaca, New York, most visible aurora is at low angles in the north. Overhead visible aurora is seen only for a total of a few hours over the whole year, and southern aurora is even more difficult to study. For high latitudes, with generous quantities of aurora, the experimental observations require some unusual process to be involved which will limit the echoes to the ranges and azimuths that are found.

### An Explanation

Supported by these observations, Booker, Gartlein, and Nichols<sup>11</sup> at Cornell have enlarged upon a theory by Moore<sup>12</sup> which considers the auroral ionization to be composed of numerous streaks of ionization running parallel to, or concurrent with, visible auroral rays. Aurora is believed to be caused by charged particles shot from the sun which are able to enter the earth's atmosphere only if they follow the lines of the earth's magnetic field. Indeed, auroral rays are sloped slightly with respect to your horizon, because they are following the lines of the earth's magnetism. A corona (overhead star-shaped formation) is a bundle of such rays viewed up from the bottom, the center appearing slightly to the south. Now meteor trail ionization has been previously studied and has been found to give v.h.f. radio reflections best when looking perpendicular to the trail.<sup>13</sup> The perpendicular requirement becomes more severe as one uses higher frequencies. The strength of the reflected signal fluctuates during formation and during wind distortions of the meteor trail, because the contributions to the total signal from the different parts of the trail interfere with each other.<sup>14</sup> The Booker, Gartlein, and Nichols theory im-

(Continued on page 118)

<sup>11</sup> Booker, Gartlein, and Nichols (to be published). Presented at URSI-IRE Meeting at Ottawa, Canada, October, 1953.

<sup>12</sup> Moore, *Journal of Geophysical Research*, 56, p. 97 (1951).

<sup>13</sup> Lovell, Banwell, and Clegg, monthly notices of the Royal Astronomical Society, 107, p. 164 (1947).

<sup>14</sup> Manning, Villard, and Peterson, *Journal of Geophysical Research*, 57, p. 387 (1952).



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agines the auroral ionization to be composed of hundreds of such "meteor" trails. This would explain the observed fast-fading or growl of the aurorally-propagated signal. It would also require that the radio-ray paths be nearly perpendicular to the trails, or in this case, the earth's magnetic field. (See Fig. 10.)

Calculations have been made by Chapman<sup>15</sup> for locating the feet of perpendicular lines from the receiver and transmitter to the lines of the earth's magnetic field. These calculations relate the height above the earth, the range of expected echoes, the angle of elevation of the radio path, and the latitude of the echo point for a given magnetic latitude of the observing site. Theoretically, auroral echoes should be limited to northerly directions in the northern hemisphere and should occur only at large distances having low angles of elevation. This, as shown in earlier paragraphs, is verified by experiment.

Since auroral reflections can come only from low angles of elevation with respect to the horizon, the amateur should design his antenna to favor these directions. The antenna should be very sharp in the vertical plane and pointed at the horizon. Thus, vertical stacking is highly recommended. Low-angle radiation requires that the antenna be high above the surrounding terrain and emphasizes the importance of a good QTH and a tall tower. The perpendicularity theory would suggest a greater spread in azimuth than in the elevation angle, and indeed, simultaneous echoes have been obtained from separated directions in the north. It would, therefore, be wise to leave the horizontal pattern as broad as 30 degrees or so, meaning that the antenna should not be wider than about 4 dipoles. Frequently, during violent aurora, there is difficulty in finding the direction that gives maximum signal. It is tempting to think that such behavior is due to signals arriving from high angles of elevation, where the auroral light appears brightest, but this explanation is probably false. The perpendicularity theory may explain why aurora seen visually does not give a signal because of its position. (In addition, it is felt by some that active ray forms will give stronger signal than quiet arc forms.) In general, sufficient low-angle radiation is a more important aid in getting strong auroral signals than was previously expected.

### Acknowledgements

A large vote of thanks is due the many amateurs that have sent in auroral reports via Tilton and QST. Here is a further example of amateur radio supplying research information difficult to obtain in any other way. Assistance has been rendered by Ken Bowles, W2MTU, and Ed Tilton, W1HDQ. Financial aid has been provided by the U. S. Army Signal Corps at Cornell and the Geophysical Institute at the University of Alaska.

<sup>15</sup> Chapman, *Journal of Atmospheric and Terrestrial Physics*, 3, pp. 1-29 (1952); see also *Journal of Geophysical Research*, 58, September, pp. 347-352 (1953).

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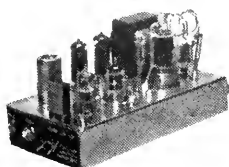
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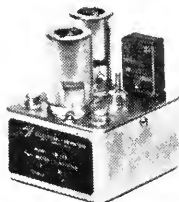
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## Mobile Converter

(Continued from page 20)

The r.f. amplifier may now be lined up, band by band, by tuning in a signal from a generator or the antenna, and then adjusting the amplifier grid and plate coils for maximum response. The grid-coil slug should be adjusted with signals near the high-frequency end of the band, and with  $C_3$  set near minimum capacitance. The antenna coupling should then be adjusted to the point where a slight peak in signal or background noise is heard within the range of  $C_3$ .

At 3.5 and 7 Mc., it is important that the receiver used with the converter be well shielded if broadcast-band interference is to be avoided. Most car receivers are well shielded, but some of the less-expensive communications receivers may not be. However, the converter will be most useful to a communications receiver at the higher frequencies where feed-through will usually be negligible. When interference from local broadcasting stations is experienced, the slug of  $L_1$  should be adjusted to minimize the strongest b.c. signal toward the low-frequency end of the b.c. band, while the slug of  $L_2$  should be likewise adjusted for the strongest signal toward the high-frequency end of the band. These two adjustments will usually serve to attenuate most other b.c. signals between the two extremes of frequency. However, other combinations may be advisable, depending on the frequencies of the local stations. In most cases, it should be possible to wash out b.c. interference, by adjustment of these two traps to the point where it is no longer bothersome.

In some parts of the country, the second harmonic of the 2900-ke. crystal will beat with WWV's 5-Mc. signal, so that it will be heard when the b.c. receiver is tuned to 800 kc. (or signal frequency of 3700 kc.). This can be used as a check point for the frequency alignment of the b.c. receiver.

With the crystal frequency known, ham-band frequencies can be determined quite accurately (if the b.c. calibration is correct) by simply adding the h.f.-oscillator frequency, given in the table, to the reading of the b.c. dial.

Measurements with a signal generator showed that recognizable audio output could be obtained with a signal input as low as 0.1  $\mu$ v. Most of the background noise disappeared with the input signal raised to 0.3  $\mu$ v., and solid reception was possible with an input signal of about 0.5  $\mu$ v.

The cost of a complete set of components for this converter will run about \$65.00. The crystal and set of three coils required for each band runs about \$7.65, so that the cost will be reduced by this amount for each band that is not needed.

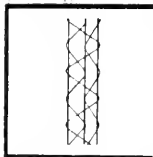
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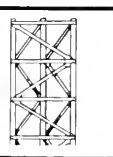
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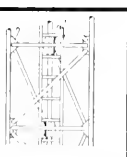
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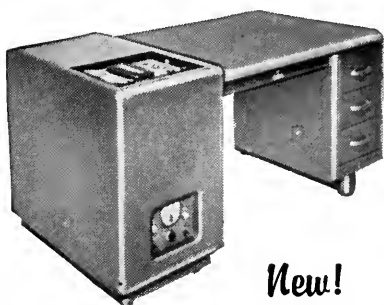
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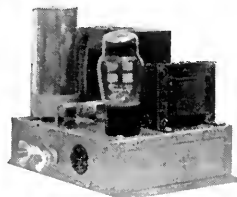
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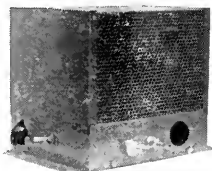
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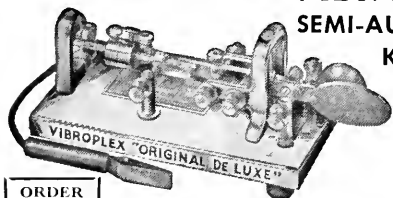
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## Cubical Quad

(Continued from page 23)

loop are at equal distances from the center. A permanent joint can then be made between antenna wire and pole by wrapping several turns of bare copper wire tightly around the pole where the antenna touches it, threading the ends of this bare wire through small holes drilled in the bamboo pole, and then soldering together as shown in Fig. 3. Use a good grade antenna wire so it will not stretch later.

The main boom consists of a 12-foot piece of 2 X 2 pine with another 6-foot piece used as a center brace to prevent the ends of the boom from dropping. This boom is mounted at its center by bolting it to a piece of angle iron welded to the top of the rotator shaft. A lower boom composed of a 12-foot piece of 1 X 2 pine is mounted by means of a small bracket 8 feet 4½ inches down the rotator shaft parallel to and in the same plane as the main boom. The completed radiator and reflector are fastened to the ends of the main boom by means of the mounting brackets, and the center insulators for the radiator and reflector are fastened to the ends of the lower boom which also serves to support the feed line and the reflector stub. This lower boom is probably unnecessary but it does make the beam neater and stronger.

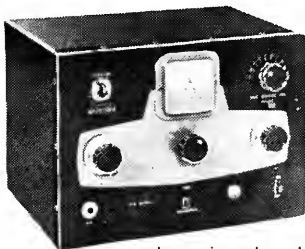
The radiator and reflector are made exactly the same. Small insulators are placed in the center of the bottom side of both reflector and radiator and the stub is fastened to the one and the feed line to the other. Seventy-two ohm coax will give a very close match, but 52-ohm coax has been used here with very good results, even though there is some mismatch. The stub for the reflector is 6 feet long and spaced 3 inches. A very simple sliding short can be made by putting a Fahnestock clip on each wire of the stub and then soldering a wire between these clips. This "short" can be easily slid along the stub from the top of the antenna tower or pole by means of a small stick. Remember to use bare copper wire for the stub or the sliding short will not work. After the beam is in place atop the tower, the reflector may be tuned by sliding the shorting bar up and down the stub until a minimum S-meter reading is obtained from a local ham located off the back of the beam. That is all there is to it; you are now tuned on the nose and ready for business.

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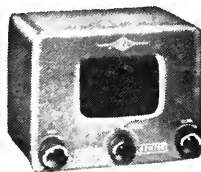
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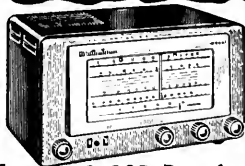
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## Receiver Performance

(Continued from page 27)

extremely large signal-handling capabilities required. Several tubes recently announced show some promise, but until they are proven the receiver designers laughingly suggest a 4-125A or similar for the receiver r.f. stage.

To prove cross-modulation when operating "on the air," the received signal can be reduced with a 20-db. resistive attenuator. This will reduce an S9 signal to about S6, which is still readable, but at the same time drop a 1-volt signal, due to that kilowatt next door, to 0.1 volt. If the splatter disappears when the attenuator is placed in the antenna lead, then the difficulty is in the receiver. Remember not all modulation splatter is in the receiver. A few inconsiderate amateurs are guilty of severe overmodulation. A more simple test is to remove the normal antenna and connect any short piece of wire that will reduce the desired signal to a just readable level, and then note the presence or absence of splatter. Either test is acceptable for tracing the source of this type of interference.

If you are not looking for weak signals, either of the above methods for reducing input signal level can help receiver cross-modulation. A separate r.f. gain control (variable cathode resistor) is also sometimes helpful in reducing the cross-modulation that occurs in the mixers.

This receiver discussion has been handled in general terms. A later article will give some hints as to how the 75A-3 can be adapted best to serve the amateur with special interests like DX work on one hand or just local rag-chewing on the other.

I would like to express my appreciation to the many Collins engineers who assisted in this discussion of receiver performance.

## Appendix

So-called thermal noise is generated in any resistance whether it is the antenna resistance, the parallel tuned impedance of the r.f. stage grid circuit, or an actual resistor. Noise power is proportional to absolute temperature, bandwidth, and resistance. Noise power is given by

$$N = \frac{E_n^2}{R} = \frac{4KT \Delta f R_{eq}}{R}$$

where

$K$  = Boltzman's constant =  $1.38 \times 10^{-23}$ ;

$T$  = Absolute temperature, 300° at room temperature;

$\Delta f$  = Bandwidth in cycles;

$R_{eq}$  = Noise resistance of the receiver plus the dummy antenna; and

$R$  = Sum of the receiver input resistance plus the dummy antenna resistance.

Signal power is given by  $S = \frac{(mE_c)^2}{R}$

where  $m$  is the percentage of modulation divided by 100 — sometimes called modulation factor;

$E_c$  is carrier voltage of receiver signal; and  $R$  is as above.

A perfect receiver is one which has no noise due to coupling circuit, r.f. stage shot noise, mixer noise, or any other noise contribution except that of thermal noise given by the above expression.

Noise figure =  $N.F. = \frac{S/N \text{ theoretically perfect receiver}}{S/N \text{ actual receiver}}$

(Continued on page 126)



*Gratitude is  
a debt I  
intend to repay.  
Uncledave*



← Then

Now →



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My best wishes for a healthy, happy and prosperous New Year.

73 — CUL

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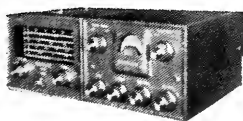
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As the actual receiver approaches theoretical performance, the above expression approaches 1.0, or 0 db. If the receiver noise is zero except for thermal noise across  $R_{eq}$ , and the antenna matches the receiver input resistance, then  $R_{eq} = 2R$  and the noise figure is 2.0 (3 db.), because the noise power is doubled over that of the ideal receiver.

### Example 1:

Assume a perfect receiver of 6-kc. bandwidth and a 100-ohm antenna with no input circuit losses or set noise. What is the required input level at  $m = 0.3$  for a signal-plus-noise-to-noise ratio of 10 db.?

$$\text{If } \frac{S+N}{N} = 10, \frac{S}{N} = 9$$

$$\frac{S}{N} = \frac{(mE_c)^2}{4KT \Delta \text{ant } fR} = 9$$

$$E_c = 0.98 \text{ microvolts.}$$

If the receiver is matched to the antenna (which should be done in the practical case), then the noise is 3 db. greater and, to preserve the same signal-to-noise ratio, the signal must increase 3 db.

$$E_c = 0.98 \times 1.4 = 1.39 \text{ microvolts.}$$

### Example 2:

Suppose the receiver of Example 1 was found to have a signal-plus-noise-to-noise ratio of 10 db. with an input of 1.8 microvolts in a matched case. What is the noise figure?

From Example 1:  $1.39 \times 10^{-6}$  volts for  $N.F. = 3$  db.

$$N.F. = 3 + 20 \log \frac{1.8}{1.39} = 5.2 \text{ db.}$$

## Grounded-Grid

(Continued from page 36)

near cut-off. An oscilloscope is necessary for proper adjustment. With the 'scope connected to the r.f. output of the linear the loading, bias and excitation should be adjusted until the waveshape of a 400-cycle tone is a replica of the same tone being applied to the driver. When modulation is removed the amplifier input should not vary and the height of the r.f. envelope on the 'scope should be reduced to half the full-modulated size. For adjustment with single-sideband exciters refer to the 1954 ARRL *Handbook*.

A copper plated, expanded steel shield was used over the top of the chassis and no TVI complaints have been filed.

Don't forget that every point in this circuit contains potentially dangerous r.f. or d.c. power. Pull out the wall plug before monkeying with the works.

The final test is an 8 P.M. CQ on forty. The blast of QRM answering on your frequency is very satisfactory!

## FEED-BACK

The following errors have been detected in Burns, "Sideband Filters Using Crystals," in the November, 1954, issue:

Page 39, reference 14, should be *Electrical Communications*, December, 1949.

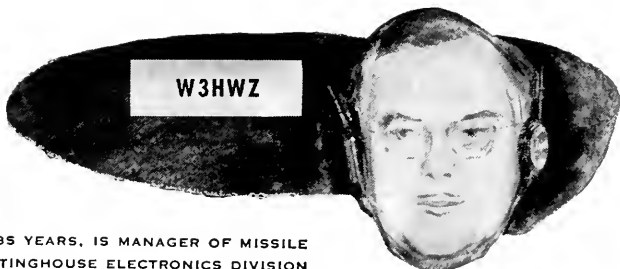
Page 148, seven lines from the bottom of the column,  $C_c$  should appear instead of one of the  $C_{D's}$ .

Page 150, third line, replace  $C_c$  with  $C_D$ .

Page 150,  $f_{L2C2}$  and  $f_{L3C3}$  in the equations of Appendix I should each have an exponent "2." In other words, the correct values will be the square roots of those determined by the formulae as shown.

**CQ**  
= : - : =

W3HWZ



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## Noise Reduction

(Continued from page 37)

really big advantage of the traps is that they do not interfere with motor performance. The decreased motor performance will bother the amateur who loves his car, as he does his ham rig. Here in the Cumberland Mountains, the loss in power on grades when suppressors were used was distinctly noticeable.

The traps are easily constructed, and the mounting problem solved, by drilling through standard commercial suppressors to open their resistance (not strictly necessary, but it will increase the  $Q$  of the circuit), and then winding the coils around them. If no grid-dipper is available, 7 turns of No. 20 wire, close-wound, tuned with a 50- $\mu$ f. disk ceramic condenser, will be effective over the entire ten- and eleven-meter bands. If only one-band operation is desired, these traps are well worth the effort spent in constructing them. Similar traps should effectively solve your noise problems in circuits where simple by-passing fails.

In case anyone is worried about it, removal of the suppressors did not result in an increase in noise on the b.c. band.

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W1WRJ	A. Murray Rommé, "mr"
W1YYM	Ellen White, "ln"
W1ZCS	Marie L. Page, "rie"
W1ZDP	Phil Simmons, "phil"
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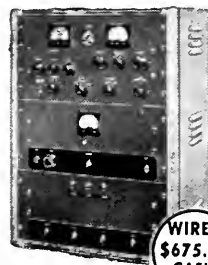
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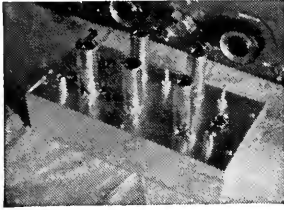
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## Happenings

(Continued from page 49)

Des Moines, Iowa: Sometime in January and April.  
Detroit, Mich.: 1029 Federal Bldg.: Wednesday and Friday.  
El Paso, Texas: March 29.  
Fort Wayne, Ind.: Sometime in February and May.  
Fresno, Calif.: March 18, June 17.  
Grand Rapids, Mich.: Sometime in January and April.  
Hartford, Conn.: March 8.  
Hilo, T. H.: April 5.  
Honolulu, T. H.: 502 Federal Bldg.: Monday through Friday.  
Houston, Texas, 324 U. S. Appraisers Bldg.: Tuesday and Friday.  
Indianapolis, Ind.: Sometime in February and May.  
Jackson, Miss.: March 9, June 8.  
Jacksonville, Fla.: April 16.  
Juneau, Alaska, 7 Shattuck Bldg.: By appointment.  
Kansas City, Mo., 3100 Federal Office Bldg.: Friday.  
Klamath Falls, Oregon: Sometime in May.  
Knoxville, Tenn.: March 23, June 22.  
Lihue, T. H.: April 12.  
Little Rock, Ark.: January 12, April 13.  
Los Angeles, 539 U. S. Post Office and Courthouse: Wednesday, 9 A.M. and 1 P.M.  
Louisville, Kentucky: Sometime in May.  
Manchester, N. H.: June 8.  
Marquette, Mich.: May 11, 10 A.M.  
Memphis, Tenn.: January 7, April 7.  
Miami, Fla., 312 Federal Bldg.: Thursday.  
Milwaukee, Wisconsin: Sometime in January and April.  
Mobile, Ala., 419 U. S. Courthouse and Customhouse: Wednesday and by appointment.  
Nashville, Tenn.: February 2, May 4.  
New Orleans, La., 400 Audabon Bldg.: Monday through Friday except Monday through Wednesday only at 8:30 A.M. when code test required.  
New York, N. Y., 748 Federal Bldg., 641 Washington St.: Monday through Friday.  
Norfolk, Va., 402 Federal Bldg.: Monday through Friday except Friday only when code test required.  
Oklahoma City, Okla.: January 13-14, April 14-15.  
Omaha, Nebr.: Sometime in January and April.  
Philadelphia, Pa., 1005 U. S. Customhouse: Monday through Friday, 8:30 A.M. to 2 P.M.  
Phoenix, Ariz.: Sometime in January and April.  
Pittsburgh, Pa.: Sometime in February and May.  
Portland, Maine: April 12.  
Portland, Ore., 433 U. S. Courthouse: Friday, 8:30 A.M. for 20- and 13-w.p.m. code tests.  
Rapid City, S. D.: Sometime in May.  
Roanoke, Va.: April 2.  
St. Louis, Mo.: Sometime in February and May.  
St. Paul, Minn., 208 Federal Courts Bldg.: Friday.  
Salt Lake City, Utah: March 18, June 17.  
San Antonio, Texas: February 3, May 5.  
San Diego, Calif., 15-C U. S. Customhouse: By appointment.  
San Francisco, Calif., 323-A Customhouse: Friday.  
San Juan, P. R., 323 Federal Bldg.: Thursday, and Monday through Friday at 8 A.M. if no code test required.  
Savannah, Ga., 214 P. O. Bldg.: By appointment.  
Schenectady, N. Y.: March 16-17, June 15-16, 9 A.M. and 1 P.M.  
Seattle, Wash., 802 Federal Office Bldg.: Friday.  
Sioux Falls, S. D.: March 9, June 8, 10 A.M.  
Spokane, Wash.: Sometime in May.  
Springfield, Mo.: Sometime in June.  
Syracuse, N. Y.: Sometime in January and April.  
Tampa, Fla., 410 P. O. Bldg.: By appointment.  
Tulsa, Okla.: January 17-18, April 18-19.  
Tucson, Ariz.: Sometime in April.  
Wailuku, T. H.: April 8.  
Washington, D. C., 415 22nd St., N. W.: Monday through Friday, 8:30 A.M. to 5 P.M.  
Wichita, Kansas: Sometime in March.  
Williamsport, Penna.: Sometime in March and June.  
Wilmington, N. C.: June 4.  
Winston-Salem, N. C.: February 5, May 7.



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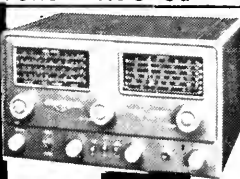
1200 FT. REEL  
Genuine Plastic Base  
**RECORDING TAPE**  
Shpg. Wt. 14 oz.

LAFAYETTE made a terrific deal with one of the leading manufacturers of recording tape to supply us with their regular tape which sells for almost twice our price. **WE GUARANTEE ABSOLUTE SATISFACTION OR YOUR MONEY BACK.** The finest, professional-quality recording tape obtainable. Highest performance for thousands of playings. Red Oxide Base in a smooth, uniform coating; greater signal strength; with maximum fidelity; uniform frequency response from 40-15,000 cps.

**\$1.89** per roll plus postage (C.O.D. accepted)

In lots of 10 rolls - **1.75 ea**

**LAFAYETTE**  
Has a  
**COMPLETE LINE**  
**NATIONAL**  
**RECEIVERS**  
In STOCK



NC-88 "World-Master"..... **119.95**

## CARDWELL UHF CONVERTER SALE!

List **42.50**  
Net **13.95 ea.**  
Lots of 3

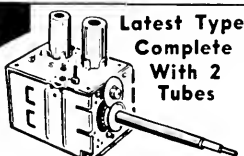


Singly **14.45 ea.**

Outstanding Value! The Cardwell ES-1 UHF converter covers the entire UHF spectrum—channels 11-83. Has 6AF1 oscillator, 6CB6 IF amplifier and 1N72 crystal diode. Features printed circuit oscillator; high overall gain (3 to 4 times), high sensitivity, constant L/C ratio tuner, 25-1 gear drive. Has AC cord and plug, 3-pcs. switch for UHF, VHF and OFF. Handsome wood cabinet 8 3/4" x 6 1/2" x 3 1/4" with easy reading dial. Shpg. Wt. 4 1/2 lbs.

CARDWELL ES-1 Converter—Lots of 3 each..... **13.95**  
Singly each..... **14.45**

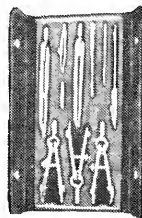
## SARKES TARZIAN VHF TUNER



Latest Type  
Complete  
With 2  
Tubes

Brand new—covers entire VHF spectrum. It is an exact duplicate of thousands now in use in many chassis including the Sylvania 510 and 520 series. Has 7" long concentric shafts. Excellent gain, noise factor, image and I.F. rejection. For 40 mc. IF systems. Complete with 6BC5 and 6X8 tubes and shields. Shpg. Wt. 4 lbs. Worth 3 times the price!

TL-24—In lots of 3 each..... **4.45**  
Singly each..... **4.95**

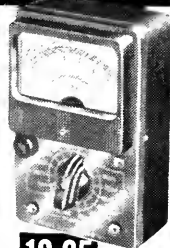


**PRECISION DRAFTING SET**  
11 Pieces—Fitted Felt-Lined Case  
Made in Germany, of heavy brass, nickel plated and polished. Instruments include 3/4" Compass with pencil and pen points and lengthening bar, 5/8" Divider, three 3 1/2" sidewheel bow dividers with needle point, pen point and pencil point. 5" Ruling pen, extra handle for pen or pencil, capsule with extra leads. Interchangeability of these many parts makes this an exceptionally versatile set. Your money back—if this set is not worth twice our price!

F-13..... Net **2.75**

## HIGH SENSITIVITY AC-DC MULTITESTER 20,000 ohms per Volt

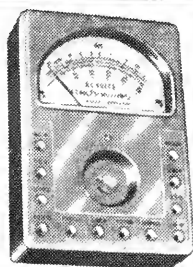
The new Lafayette High Sensitivity Multitester is a complete instrument (not a kit). Here is an instrument packed with every desirable feature found only in instruments costing twice as much. One of the most sensitive multitesters ever offered. **20,000 ohms per volt DC; 5,000 ohms AC**, having a high sensitivity 15 microamps meter. Full scale AC-100 voltage ranges are 0-10V, 0-50V, 0-250V, 0-500V, 0-1000V; DC current ranges 50 microamps, 2.5 ma, 25 ma, 250 ma. Resistance: 0-5K ohms, 0-50K ohms, 0-500K and 0-5 megohms. Decibel range: -20 +5 db; +5 +22 db (0 db -0.75V -600 ohms). Extreme versatility and accuracy. 1/2" precision resistors; 3" meter; beautiful plastic front, with metal bottom for ruggedness. Size: 3 3/4" x 5 1/2" x 2 1/2". Complete with batteries and leads. Shpg. Wt. 4 lbs.



RW-30G..... NET **19.95**  
In lots of 3 **19.25**

## NEW POCKET AC-DC VOM MULTITESTER 1,000 ohms per Volt

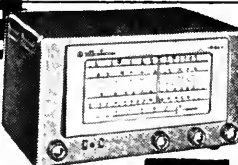
This instrument is one of the best buys that Lafayette has ever offered in a Wide Range AC-DC MULTITESTER. An ideal portable unit that meets the need for a compact, yet rugged test instrument. Has ease of operation usually **FOUND ONLY IN MORE EXPENSIVE INSTRUMENTS.** Has 1000 ohms/volt sensitivity on both AC or DC. Uses full 3" rectangular meter with large easy to read scale. Uses 1/2" precision resistors, jeweled D'Arsonval microamp meter movement. Ranges: AC-DC and output volts 0-5, 0-25, 0-250, 0-1000V; DC current 0-1, 0-10, 0-100, mA; Resistance 0-10K and 0-100K ohms. In handsome sturdy bakelite case. Size: 4 1/2" x 3 1/4" x 1 1/2". Supplied Complete with test leads and batteries. A Must for every serviceman, shop, Laboratory or experimenter—and at Lafayette's Price you can afford to own one. Shpg. Wt. 2 1/2 lbs.



MODEL RW-27C—Complete  
In Lots of 3 **9.45**  
Single, ea. **9.95**

**9.95**

## LAFAYETTE Has a COMPLETE LINE of HALLICRAFTER RECEIVERS In STOCK



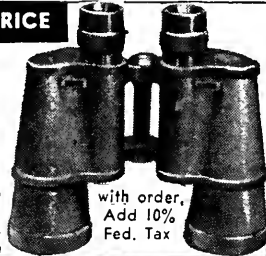
HALLICRAFTERS S-38D  
220 Volt Adapter Cord for above

Net **49.95**  
Net 2.00

## NEVER BEFORE AT THIS PRICE

### IMPORTED DIRECT PRISM-COATED LENSES BINOCULARS

- ALL-METAL CONSTRUCTION
- INDIVIDUAL FOCUS
- COMPLETE WITH LEATHER CASE & STRAPS



F-86, 8x30 with case Net **19.95**  
F-15, 7x35 with case..... Net **22.50**  
F-103, 7x50 with case..... Net **24.95**  
F-104, 12x50 with case..... Net **32.50**

with order, Add 10% Fed. Tax

Write for **FREE Bargain Packed Catalog!**

**Lafayette Radio**  
DEPT. VA  
Include postage with order

NEW YORK, N.Y. 100 Sixth Ave.  
BRONX, N.Y. 542 E. Fordham Rd  
NEWARK, N.J. 24 Central Ave.  
PLAINFIELD, N.J. 139 West 2nd St.  
BOSTON, MASS. 110 Federal St.

# ROTARY BEAM KITS

**3 ELE 20 METER** 24' 2" SQ. BOOM, Tilting beam mount, 1 1/2" ele., 1 1/4" telescoping ends.  
@ \$100.75

Same as above with 1 1/4" ele. with 1" ends @ \$89.95

**3 ELE 15 METER** 18' 2" SQ. BOOM, Tilting beam mount, 1 1/4" ele.  
@ \$74.95

**3 ELE 15 METER** 12' 1 1/4" ROUND BOOM, Fixed beam mount, 3/4" ele.  
@ \$30.95

**3 ELE 10 METER** 12' 1 1/4" ROUND BOOM, Fixed beam mount, 3/4" ele.  
@ \$28.50

All above kits furnished with either "T" or Gamma match. Write for complete listing.

## 3SH14 Perforated Aluminum Sheet

Cut to Your Dimensions

.032—1/8" Holes—Spaced 3/8" @ \$ .85 sq. ft.

.031—1/8" Holes—Spaced 3/4" @ \$1.20 sq. ft.

Most sizes of aluminum tubing, plain sheet, angle, channel, rod, screws, nuts and bolts.

## RADCLIFF'S

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## Evans RADIO

"YOUR FRIENDLY SUPPLIER"

HEADQUARTERS FOR TRIAD ELECTRONIC TRANSFORMERS

Service to hams by hams • Nationally accepted brands of parts, tubes and equipment. Trade-ins and time payments. Write W1BFT.

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CONCORD, N. H.

## RADIO-LABORATORY MAN

Need experienced lab man for amateur pre-production prototype work. Receiver-transmitter VHF experience necessary. Submit full qualifications in first letter.

### GONSET COMPANY

801 S. Main Street, Burbank, California

## DX Competition

(Continued from page 67)

c.w. section is 18, and contacts made on the same band with the same country after the quota is filled will not count. Thus complete exchanges with 6 stations in one country on one band fill the band quota for that country. The maximum number of points per country per band which may be earned by VE/VO stations in the c.w. section is 24, and contacts made on the same band with the same country after the quota is filled will not count. Exchanges with 8 stations in one country on one band are thus permitted Canadian participants. There is *no quota* for stations in the c.w. section outside of the U. S. and Canada. There is *no quota* for any station in the 'phone section.

11) *Reporting*: Contest work must be reported as shown in the sample form. Each entry must include the signed statement as shown in that example. Contest reports must be mailed no later than April 29, 1955, to be eligible for QST listing and awards. All DX Contest reports become the property of the American Radio Relay League. No contest reports can be returned.

12) *Awards*: To document the performance of participants in the Twenty-First ARRL International DX Competition, a full report will be carried in QST. In addition, special recognition will be made as follows:

a) A certificate will be awarded to the high scoring single-operator 'phone and to the high-scoring single-operator c.w. entrant in each country (as shown in the ARRL Countries List) and in each of the 73 U. S. and Canadian ARRL sections (see page 6 of this issue) from which valid entries are received. In addition, a certificate will be awarded to the high scoring multiple-operator station in each section or country from which three or more valid multiple-operator entries are received.

b) A suitable certificate will be awarded to the operator making the highest single-operator 'phone score in each ARRL-affiliated club, provided the club secretary submits a listing of a minimum of three 'phone entries by bona fide resident members of such club, and provided further that these scores are confirmed by receipt at ARRL headquarters of the individual contest logs from such members. The highest single-operator c.w. scorer in each club will be awarded a certificate under the same conditions.

c) ARRL will award a gavel to the affiliated club submitting the greatest aggregate 'phone and c.w. score by bona fide resident club members, whether single- or multiple-operator entries, provided such scores are confirmed by receipt at ARRL headquarters of the individual contest logs from such members.

13) *Judges*: All entries will be passed upon by the ARRL Award Committee, whose decisions will be final. The Committee will void or adjust entries as its interpretation of these rules may require.

14) *Disqualifications*: Each participant agrees to observe the contest rules as well as all regulations established for amateur radio in his country. Some examples of grounds for disqualification are: off-frequency operation as confirmed by a single FCC citation or advisory notice or two ARRL accredited Official Observer measurements; low tone reports in logs; working countries on the "banned list" — footnote information applies to U. S. A. amateurs only.

<sup>1</sup> As we go to press, prefixes to be avoided are F18, PK (except PK7), EP-EQ, HL, HS, 3W8 and XW8.

## Strays

Patience, practice and persistence have paid off for W3TOC of Etna, Pa. Licensed as a Novice three years ago, he qualified for his General Class license in November. Suddenly stricken by blindness sixteen years ago, the code was quite an obstacle. Bill isn't resting on his laurels, though — he's now busy helping five blind friends become hams!

# where to buy it?

## you can make your best deal at Burghardt's

**Terrific Trade-Ins**—As liberal as anyone in the country... and yours may be worth more at Burghardt's. Trade-ins usually cover down payment on your new gear.

**10% Down—Easy Terms**—10% down lets you "take it away." Up to 18 months to pay on balances over \$200. Burghardt's own financing saves you money—lets us adjust terms to your budget. All time payments based on 1/2 of 1% per month based on original unpaid balance. Full payment within 90 days will cancel all interest or carrying charges.

**Speedy Delivery—Personal Attention**—No order too large or small for personal attention. All inquiries acknowledged and orders processed day received.

**Prepaid Shipping**—Here's a real money-saver. All orders totaling \$50 or more net, after trade-in allowances, will be shipped to you prepaid!

100% Guarantee

**Satisfaction Guaranteed**  
or your money refunded  
after 10 day trial.

**VIKING KILOWATT POWER AMPLIFIER**—The new Viking Kilowatt has every conceivable feature for safety, operating convenience, and peak performance. Low power or maximum legal input AM, CW, or SSB may be selected with the flip of a single switch. Tuning is continuous over the range 3.5 to 30 mc. with no coil change necessary. A compact pedestal contains the complete unit, including RF power amplifier, modulator, power supplies, and all control equipment. This unit rolls out of the pedestal, providing complete accessibility to all electrical components for adjustment or maintenance. Excitation requirements are 30 watts RF and 15 watts audio for AM and 10 watts peak for SSB. The Viking "Ranger" transmitter/exciter (shown above) is an ideal RF and audio driver for AM and CW, and the new Viking SSB transmitter/exciter will drive the Viking Kilowatt to full output on SSB.

**Viking Kilowatt Power Amplifier**—wired, tested, complete with tubes... Only \$159.50 down ... \$86.92 per mo. for 18 months.

**Viking Kilowatt** complete with Matching Accessory Desk Top and 3 drawer pedestal ... Only \$171.88 down ... \$93.65 for 18 months.

**VIKING RANGER**—A rugged, compact transmitter—the Ranger may also be used as a flexible exciter unit without modification. As an exciter it will drive any of the popular kilowatt level tubes and provides a high quality speech driver system for high powered modulators. As a transmitter it is a self-contained 75 watt CW or 65 watt phone input unit with 100% AM modulation, 10 through 160 meter amateur bands. Extremely stable, built-in VFO—or may be crystal controlled.

**Viking Ranger Kit**, less tubes, crystals, key, and mike ... \$17.95 down

Also available wired and tested, less tubes ... Only \$25.80 down

**VIKING II TRANSMITTER**—TVI suppressed. All amateur bands from 10 to 160 meters, 100 watts phone output, 130 watts CW. Instant band-switching—VFO input provision—dual power supplies. All stages metered. Pi-network coupling output amplifier. Self-contained—no plug-in coils. 100% amplitude modulation.

**Viking II Transmitter Kit** complete with tubes, less crystals, key, and mike ... \$27.95 down

Also available wired and tested ... Only \$33.70 down ... \$18.36 for 18 months.

**VIKING ADVENTURER**—Big transmitter features in a new, compact CW kit. Single-knob bandswitching 80 through 10 meters—50 watts input—TVI suppressed. Easy to assemble and operate. Self-contained power supply wired for use as "extra" station power source when transmitter is not in use. Clean, crisp break-in keying.

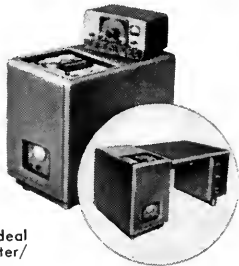
**Viking Adventurer Kit** with tubes, less crystals and key ... \$5.45 down

**VIKING VFO KIT**—Variable frequency oscillator with 160 and 40 meter output for frequency multiplying transmitters.

**Viking VFO Kit** ... \$4.25 down

**Viking VFO** wired and tested, with tubes ... Only \$6.40 down ... \$5.06 for 12 months.

**VIKING "MATCHBOX"**—Performs all antenna loading and switching functions required in most medium power Amateur stations. Only \$4.95 down ... \$7.70 for 6 months.



**TOP TRADE-INS**—10% cash discount on the following with no trade:

Viking I	\$175.00	Hallicrafters S40B	\$ 75.00
Elmac A54H	99.00	Hallicrafters 538C	35.00
Central Electronics 10A Wired	120.00	Hallicrafters S38-38A-38B	25.00
Lysco 600	80.00	National NC 57	75.00
Harvey Wells TBS Series	60 to 95.00	National NC 125	120.00
Meissner Ex Shifters	30.00	National HRO 50	275.00
Hallicrafters SX71	165.00	Gonset Tri-Band	29.00

We have hundreds of additional items of standard equipment in our trade-in department. Write for our free bulletin

"Your confidence is our most valuable asset."

**Burghardt RADIO SUPPLY**

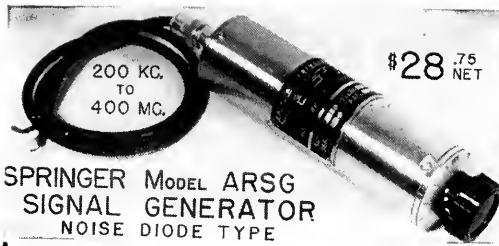
P. O. Box 41, Watertown, South Dakota Phone 749

## World Above 50 Mc.

(Continued from page 56)

simple means for obtaining a c.w. beat note with receivers like the 522 and Gonset Communicator. W6NOB suggests a b.f.o. method that may not have occurred to some owners of these receivers. He has a Command transmitter hooked up near his Communicator. Turning on this unit and tuning it so that it beats with the Communicator i.f. does the trick very nicely. A simple crystal oscillator on a frequency about 1000 kc. away from the receiver i.f. will also do.

Such makeshifts will allow you to copy the c.w. sigs you hear, but remember that they will not give you a full appreciation of the value of c.w. in weak-signal reception until you go to the higher selectivity that c.w. makes possible. Narrow the passband down to a few hundred cycles and you'll be amazed to hear the way the readability of weak c.w. shoots up. This, however, also shows that the tunable oscillators in these receivers are rather unstable. The next step is, of course, a crystal-controlled converter, a must for any real 2-meter DX enthusiast.



### SPRINGER MODEL ARSG SIGNAL GENERATOR NOISE DIODE TYPE

Length—6½" Dia.—1½" Weight—12 oz.

- Self contained, operates with Burgess Z4, 6 volt battery.
- Ideal for receiver sensitivity checks and "Touch Up" alignment to improve signal to noise ratio of AM receiving equipment.
- Generator signal output connection provided thru 24" length of 52 ohm concentric line.
- Average maximum signal output level of generator is 15 microvolts.
- Calibrated linear dial provided for output control.

**EARL W. SPRINGER AIRCRAFT RADIO CO.**  
Sky Harbor Airport, Route 11, Box 330  
INDIANAPOLIS 19, INDIANA



## U. S. N. R.



An ardent amateur radio operator is the commanding officer of Naval Reserve Electronics Division 8-12, Paris, Texas, which won the Hooper trophy in national competition for excellence in Naval Reserve electronics training. He is Cmdr. Paul H. Daniels, USNR, W5CTM. He has held an active amateur license for 30 years and a commercial license for 28 years.

Cmdr. Daniels' interest in amateur radio activities helped him to progress rapidly in the Naval Reserve. He enlisted as a radioman first class in 1931. Three years later he was chief petty officer in charge of USNR Communication Reserve Unit No. 7, Junction City, Kans. At that time he was discharged to accept a commission as ensign in the Naval Reserve. He reported for active duty to the Commandant, Norfolk Navy Yard, as assistant communications officer in April, 1941.



Cmdr. Paul H.  
Daniels, USNR.

During World War II Cmdr. Daniels served on the staff of Commander, Operational Training Command, U. S. Atlantic Fleet. In 1947 he was designated to command Volunteer Electronics Warfare Company 9-146, Emporia, Kans. He was relieved of command when he moved to Paris in 1949. Cmdr. Daniels was assigned to Volunteer Electronics Warfare Company 8-51, Paris, as training officer. He assumed command of the company in August, 1950. On deactivation of the volunteer company in 1951 and activation of Organized Electronics Company 8-12, Cmdr. Daniels was named commanding officer.

He has made his hobby his profession. In civilian life, he is chief engineer for the Paris radio station, KPLT.

Six members of Naval Reserve Electronics Platoon 8-50, Clarksville, Ark., hold amateur radio licenses. They are Lt. James K. Harrison, W5WXN, officer in charge; Russell E. Murray, CWO, W5VUL; Phillip B. Latimer, ETC, W5JPY; Grover F. Krohn, ATC, W5SXM; Frank Carl Eichenberger, SA, W5WUP; and Joseph V. Murray, SN, WN5BGX. W5WXN, WN5BGX, and W5WUP obtained their General Class licenses through membership and training in the Clarksville unit.

Last year W5JPY organized a code class for members of a Boy Scout troop to qualify them for a code merit badge. Eight scouts continued their study and four now hold Novice licenses.



### New "TENACLIP" (Pat. Pend.) attaches to car... stops antenna whipping

Clear plastic clip quickly fastens to resin molding... holds right or left antennas. Prevents damage to antenna from low hanging limbs or driving into garage. See your dealer or order direct. No C.O.D.'s please.

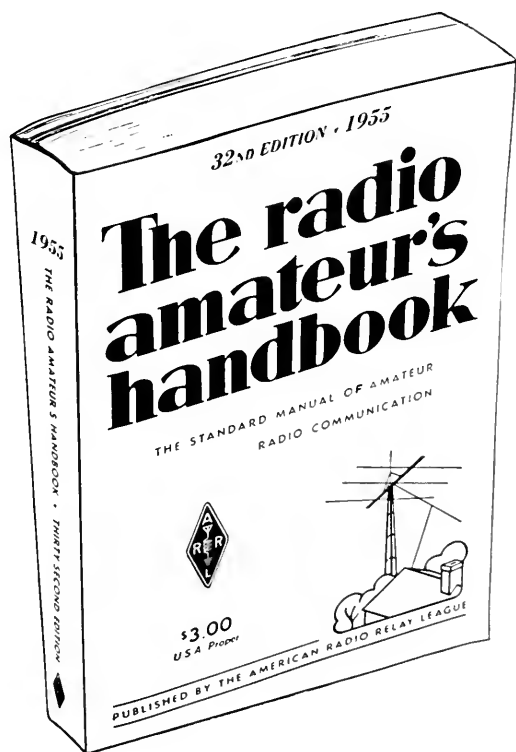
PLASTICLES, 4207 GRAND RIVER, DETROIT 8, MICH.

**\$1.98**

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...wants Radio Amateurs owning our antennas as Sales Representatives in their own local areas. Selling our Automatic Multi-Band Sky-hooks to hams who KNOW that "Your Rig Is Only as Effective as the Antenna You Tie It To" can be very profitable, for these Electromagnetic Decoupling radiators are a major advance in the state of the art of communications. Prices are REASONABLE and start at \$99.00! See our full page ad on page 111 and then write Bob Jackson personally at the address given.



# 1955 EDITION

*Big...*

*Revised...*

*Complete...*

Internationally recognized, universally consulted. A complete and comprehensive treatment of radio and electronics from simple to advanced radio theory and technique. A valuable asset, a constant reference source for the bookshelf of every amateur, engineer, experimenter and technician. Theory, construction, application—all are covered in this widely accepted Handbook—plus a complete catalog section featuring leading manufacturers and suppliers of electronic equipment, components and tubes, providing an excellent buying guide for purchasing agents as well as individual users of parts and equipment.

**\$3 USA proper**

**\$3.50 US Possessions and Canada**

**\$4 Elsewhere**

**Buckram Bound Edition \$5 Everywhere**

**The AMERICAN RADIO RELAY LEAGUE, Inc.**  
WEST HARTFORD 7, CONN.

# Go Mobile

## NEW BABCOCK

### MT-5B

#### MOBILE D-X MITTER 6 Band Bandswitching



5" x 8" x 7" deep

Vibration-Proof, Shock-Proof, Small, Compact

New exclusive meter, D'Arsonval movement, new crystal oscillator circuit using 6CL6 tube. VFO-XTL crystal switch and VFO connector now on panel. Same professional performance and fine quality as found in Babcock military radio equipment. Constant solid signal, every tube, every part tied down. Lifetime gray Hammertone metal case, easy to install. Examine—compare—buy Babcock!

Price complete with tubes, plugs and instruction book, Ham net..... **\$119.50**

Contact your dealer or write for literature

**BABCOCK RADIO ENGINEERING, INC.**

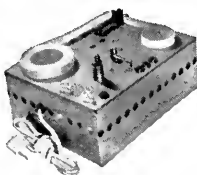
7942 Woodley Ave., Van Nuys, Calif.

Export, Frazar & Hansen, 301 Clay St., San Francisco, USA

## Facts About Learning Code

**TELEPLEX** is the method that teaches all phases of Code: Unlimited number of practice tapes contain actual sending of many different operators. **TELEPLEX** records your own sending and repeats it back to you. You **SEE** and **HEAR** your own signals. Perfect way to learn to use bug. Automatic CQ'ing. Perfect automatic transmission to put Code practice on the air. You can try it before you rent or buy it. Speed range 5 to 75 words. "Facts About Learning Code" is free and interesting. Write for it today. See it at **Blan's**, 64 Dey St., New York City

**TELEPLEX CO.** 415 G. St., **MODESTO, CALIF.**



## RME HEADQUARTERS



**DB23A Preselector.** Peps up your receiver performance. Read those unreadable signals for only..... **\$49.50**

**RME 100 Speech Clipper** provides the shortcut to 100% Q5 reports on your QSOs for only... **\$39.50**



**C & G Radio Supply Company**

2502 Jefferson  
Tacoma 2, Wash.

Phone  
BR 3181

## YL News and Views

(Continued from page 51)

for ham licenses. Eleanor was also elected president of the Unit for the coming term. . . . The daughter of W4MS, SCM of Western Florida, recently became K4AGM (Gwen). . . . YLs who attended the ARRL West Gulf Division Convention were W5s DEW EGD JAD KQG RYX SPV WXT YAJ. . . . Ten hours after the birth of her first child, KN6HJP, Laura Lee, began a series of two-meter QSOs from her hospital bed with OM KN6ELR at their home in Santa Barbara. The baby's pediatrician was K6CRJ (this item by way of OM K6ATX). . . . YLs who attended the October hamfest of the Federation of Long Island Radio Clubs were W2s EEO IGA JZX KDP MWY; K2s AFR CFF EBU; KN2JHIQ. . . . OM W3IIX points out an article in the *National Radio-TV News*, Oct.-Nov. '54 issue, which briefly describes the educational use of amateur radio by WSNEJ and XYL WSNEK, Marianne, in connection with their work on the Seney National Wildlife Refuge in Michigan. . . . The licensing of four more YLs who work at Headquarters (see photo, December *QST*, page 52) brings the total of YLs at 38 La Salle Road to ten, thanks in large measure to W1YYM, Ellen, who has conducted classes during lunch hour for months. Several of the girls who started as Novices have gone on to General or Technician Class licenses. Calls of the Headquarters girls are W1s YYM ZCS ZIB ZID ZIM ZJE; WN1s CIE CIJ CIM CLC.

### YLs You May Have Worked

Since acquiring her license in August, 1953, W0OMM, Donna Illosey, has worked various frequencies daily from morning until late at night. Active in RACES, a member of



W0OMM

the Independence Three Trails Radio Club, the Missouri Emergency Net, the Kansas Net, and the YLRL, Donna particularly likes to handle traffic going into Kansas City. She usually makes several telephone calls a day to deliver messages from servicemen and college students. Donna works 10, 20, 40, and 75. Her OM is W0QZY and her son is W0OMP.

### 1955 FIELD DAY DATES

ARRL is pleased to announce that the 1955 Field Day will be held the week end of June 25th and 26th. Whether you plan to participate with a club or on an individual basis, it's not too early to start thinking about Field Day. Watch *QST* for complete rules.

**HARRISON HAS IT!**

My Sincere 73 for your  
Merriest of Christmases  
and Happiest of New Years

*Bil Harrison, W2AVA*



**HARRISON HAS IT!**



**MILLEN** for the **HAM**  
PRODUCTS



**GRID DIPPER**

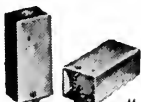
The best! No shack or Lab. should be without one! 1.7 to 300 Mc in seven coils.

#90651 \$61.50 net

**S.W.R. BRIDGE**

For 52 or 75 ohm co-ax cable  
Read S.W.R. on 0-1 ma. meter

#90671 \$16.80 net



**PHASE SHIFT NETWORK**

Precision adjusted, for 5SB Receiver or transmitter use.

#75012 \$9.75 net

**ABSORPTION WAVEMETER**

Handiest tool for any RF work!

#90605 (3 to 10 mc) \$750

#90606 (9 to 23 mc) net each

#90607 (23 to 60 mc) #90600 all four,

#90608 (50 to 140 mc) in wooden case \$30.00



**90 WATT EXCITER XMTR**



New model! Modern design, TVI suppressed, band switching 4 to 28 mc. 5763 - 6146.

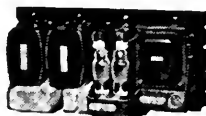
#90801 Less tubes \$75.00 net

**Modulator**

High gain 40 watt output. For use with 90801.



90831 (Less tubes) \$60.00 net



**POWER SUPPLY**

Delivers 700 VDC, 235 ma., for 90801 and 90831.

Millen Quality!

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Deluxe Rack Cabinet to house complete three units. 17 1/2" panel space.

\$19.20 net

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**MILLEN** for **INDUSTRY**  
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Black plastic knob with brass insert. 3/4" dia., 1/2" high

A006 \$4.42

Same except 1/4" dia., 3/8" high A019 .36

Same except with 3/8" OD Skirt A018 .39

Same except with 5/8" OD plastic dial with 5 index lines. A007 48

Right angle drive 1/4" 32 mfg. bushing. A012 \$3.90

Shaft Lock. Nickel plated brass A061 .39

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Shaft coupling M003 .30

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**ONE INCH OSCILLOSCOPE**

For Instrumentation. Panel Bezel matches 2" meter

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Insulated shaft extension for sub-miniature pots. M023 \$1.35



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Nov. 1954, p. 143

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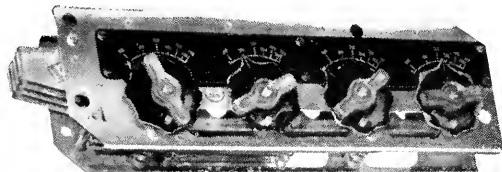
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Hlgate 4-7011



**W A N T E D !**



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RECEIVING  
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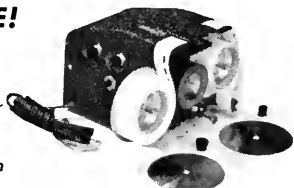
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## Correspondence

(Continued from page 50)

### FOGEY

8637 9th Court So.  
Birmingham 6, Ala.

Editor, QST:

Keep up the good work ("Fulminatin's from Ol' Fogey," Nov. QST). To me, a great deal of the pleasure of amateur radio operating is gone today because of the sloppy techniques that are in use—even in my favorite game of traffic handling. . . .

— Marc Molyneux, jr., W4MVM

1917 Glenview  
Park Ridge, Ill.

Editor, QST:

. . . Such articles as "Fogey's" are very exasperating to me; you may as well devote the space to advertising. . . .

— Jim Strandberg, W9JBZ

### SEEK YOU

Rice Rd., R.R. No. 2  
East Aurora, N. Y.

Editor, QST:

I just got my Novice about two months ago, and am I ever having fun!

One thing which is very noticeable on the Novice band is the time spent on calling CQ. A lot of the Novices call CQ ten times or more before giving their call. I feel that a CQ consisting of CQ three times, the call three times, and then that again is very adequate. Also, after making a contact with a station it is only necessary to give his call and sign yours once, or at the most twice. I am quite sure that when someone calls CQ for a seemingly endless period of time, he loses contacts because a lot of people don't want to wait until the call letters come around.

So, Novices, let's make our CQs a little shorter, thus our QSOs a little more interesting and numerous.

— Nancy Townsend, KN2JIR

### PI-NET SAFEGUARD

Chatham, Mass.

Editor, QST:

There are many transmitter circuits in QST and the Handbook which use a pi-network output circuit. In most of these circuits danger exists in case of failure of the d.c. blocking condenser. This can place the d.c. plate voltage on the antenna and feeder. In commercial designs this possibility is anticipated and protection provided by the use of an r.f. choke between the output terminal and ground. Examples of circuits in which this danger could exist may be found in Dec. 1953 QST, p. 18, June 1954 QST, p. 18, and the 1952 Handbook, pages 171, 156, 138.

After giving a little thought to this situation I think you will agree that you should bring this point to the attention of readers of your publications.

This problem is not based on theory only. I know of an instance where a serious shock resulted.

— William C. Ryder, W1JNM

[Editor's Note — This source of danger has been recognized in the ARRL Safety Code which appeared in the June, 1952, issue of QST. This measure also reduces the peak voltage across both input and output condensers, since it provides a d.c. short across the capacitors. Since the failure of the blocking condenser may cause the choke to burn out, the primary of the plate transformer should be fused, not only as a measure of personal safety, but also to save the equipment.]

### HAMFEST CALENDAR

**District of Columbia** — The Old Timers Club of the Washington and Baltimore area will hold their winter dinner and meeting the third Saturday in February in Washington, D. C. Tickets for the event will be \$3 per person, and reservations may be obtained from Dr. A. J. Dalton, 1007 Paul Drive, Rockville, Maryland.

1st Annual  
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372	394	415	437	501	522	440	461
374	395	416	438	502	523	441	462
375	396	418	481	503	525	442	463
376	397	419	483	504	526	444	464
377	398	420	484	505	527	445	465
379	401	422	485	506	529	446	466
380	402	423	486	507	530	447	468
381	403	424	487	508	531	448	469
383	404	425	488	509	533	450	470
384	405	426	490	511	534	451	472
385	406	427	491	512	536	452	473
386	407	429	492	513	537	453	474
387	408	430	493	514	538	454	475
388	409	431	494	515		455	476
390	411	433	495	516		456	477
391	412	434	496	518		457	479
392	413	435	497	519		458	480

99¢ each — 10 for only \$8.00

CR-1A	FT-171B	BC-610
SCR 522-1/2	Banana Plug,	
Pin, 1/2" SP	3/4" SPC	
5910	7350	2030
6370	7380	2045
6450	7390	2065
6470	7480	2082
6497	7580	2105
6522	7810	2125
6547	7930	2145
6610		2155
		2220
		2360
		3202
		3850
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49¢ each — 10 for \$4.00

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4280	5660	6240	6806	7625	7906
4300	5675	6250	6825	7640	7925
4330	5700	6273	6850	7641	7940
4397	5706	6275	6875	7650	7950
4490	5725	6300	6900	7673	7973
4495	5840	6325	6925	7675	7975
4535	5750	6350	6950	7700	8260
4735	5773	6373	6975	7706	8273
4840	5780	6375	7450	7725	8275
4930	5806	6400	7473	7740	8300
4950	5840	6406	7475	7750	8325
4980	5852	6425	7500	7773	8630
5030	5873	6673	7506	7775	8683
5205	5875	6675	7525	7800	8690
5300	5880	6700	7540	7825	
5385	5906	6706	7550	7840	

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1015	6125	6600	7175	8075	8475
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3735	6175	6640	7306	8140	8550
3800	6200	6650	7325	8150	8575
3885	6440	7000	7340	8173	8600
3940	6450	7025	7350	8175	8625
3955	6473	7050	7375	8200	8650
3990	6475	7073	7400	8340	8700
6000	6500	7075	7425	8350	8733
6025	6506	7100	7440	8380	
6050	6550	7125	8000	8400	
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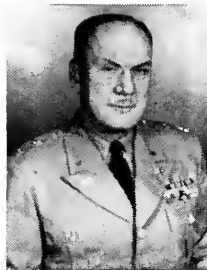
# M. A. R. S.



## Army-Air Force Observe MARS Sixth Anniversary

The Military Affiliate Radio System has entered upon its seventh year of operation. MARS will continue to emphasize the training of amateur radio operators who want to learn more about military radio practices and procedures.

Efforts are being made to establish an effective in-place system which can be made available



Maj. General Back



Maj. General Blake

to military commanders for planned use in the event of peacetime disaster or national emergency.

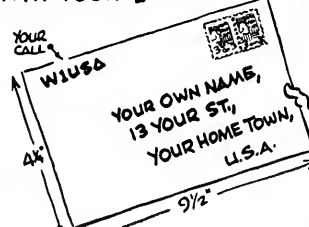
The Chief Signal Officer, U. S. Army, and the Director of Communications, U. S. Air Force, sent the following message to all MARS members on the anniversary date:

SPECIAL BROADCAST — 26 NOVEMBER 1954

To All MARS Members

The Sixth Anniversary of the Military Affiliate Radio System, 26 November 1954, marks another year of integrated radio operation and training between Army and Air Force communications and United States licensed amateur radio operators. Events of the past year have proved that military unit stations at Army and Air Force Bases can be netted with personally-owned and operated amateur facilities to provide a reliable system for training and for MARS administrative traffic. Personal messages handled for Armed Forces personnel and their families and friends have contributed to the high morale of our servicemen everywhere. The Chief Signal Officer and the Director of Communications unite in extending sincere thanks for your loyalty and support. We urge you to continue to carry on the advancement of MARS. Sgd Major General George I. Back, Chief Signal Officer, United States Army; and Major General Gordon A. Blake, Director of Communications, United States Air Force.

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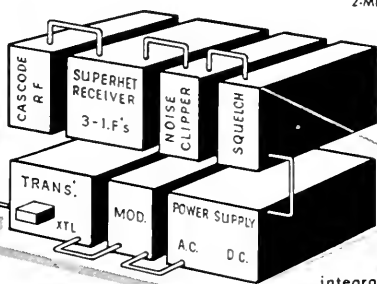
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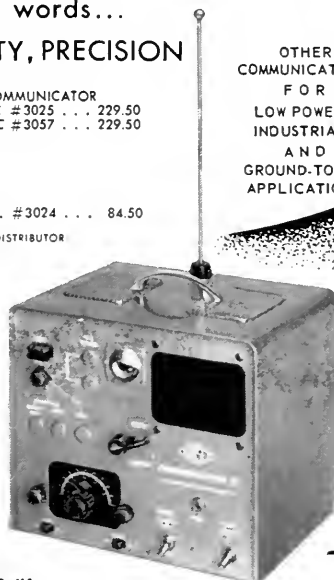
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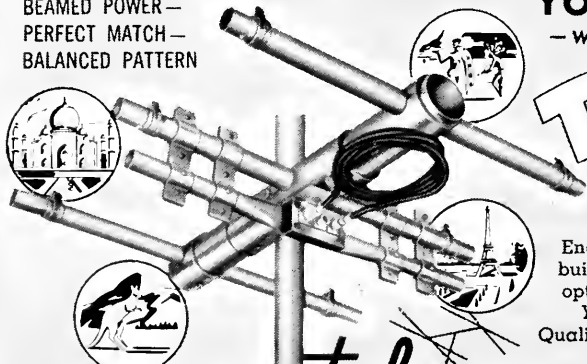
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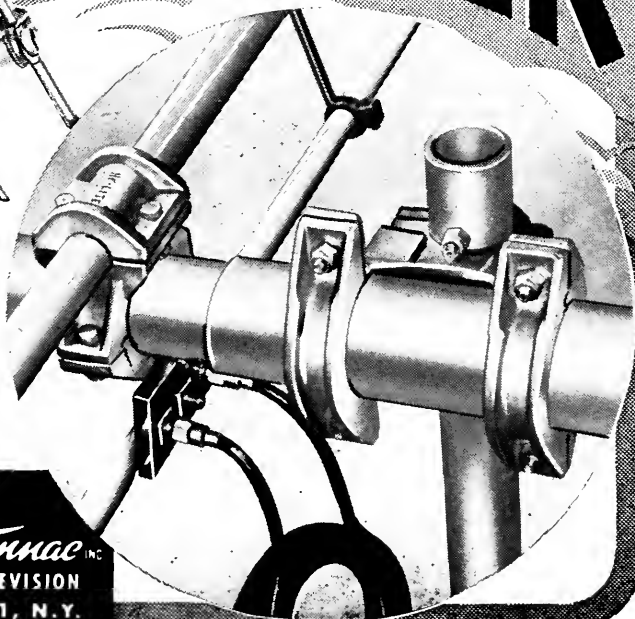
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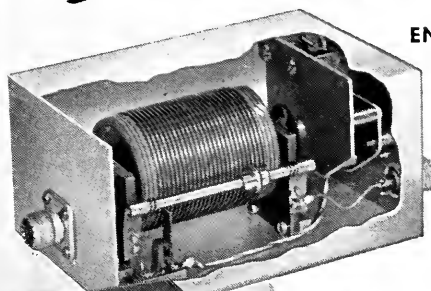
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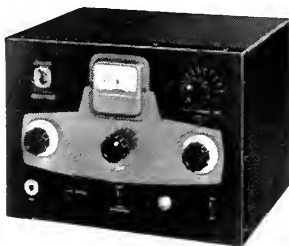
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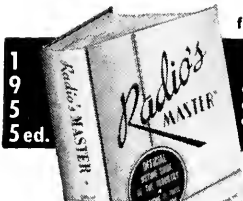
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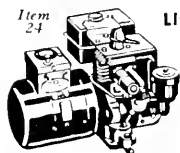
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# HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.  
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*Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.*

**QUARTZ**—Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

**MOTOROLA** use communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

**SUBSCRIPTIONS**, Radio publications. Latest Call Books, \$3.50. Mrs. Earl Mead, Huntley, Montana.

**WANTED:** Cash or trade, fixed frequency receivers 28/42 Mc. W9YIV, Troy, Ill.

**WANTED:** All types of aircraft radios, receivers and transmitters. Absolutely top prices. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

**WANTED:** Early wireless gear, books, magazines and catalogs. Send description and prices. W6GHI, 1010 Monte Drive, Santa Barbara, Calif.

**CODE slow?** Try new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

**URGENTLY need** AN/APR-4 items. New high prices. Littell, Far Hills Branch, Box 26, Dayton 9, Ohio.

**WANTED:** Cash paid for BC-610 xmtrs and BC-221 frequency meters. In addition we buy technical manuals. Also TCS sets, R5A0 ARN-7, ART-13, DY-17, others. Amber Company, 393 Greenwich St., New York 13, N. Y.

**DON'T** Fail! Check yourself with a time-tested Surecheck Test. Novice, \$1.50; General, \$1.75; Amateur Extra, \$2. Amateur Radio Supply, 1031 Seventh Avenue, Worthington, Minn.

**MICHIGAN HAMSI** Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel. 8-8696, No. 8-8262.

**WANTED:** Bargains in transmitters, receivers, laboratory and test equipment, also miscellaneous and unusual gear, etc. What have you? Please state price desired. Especially interested in husky power supplies, large filter chokes and condensers, etc. Also need plate transformers putting out about 4,000 V or more each side center. Harold Schonwald, W5ZZ, 718 North Broadway, Oklahoma City 2, Oklahoma.

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**COLLECTING** War Dept. Technical Manuals, etc., in communications and electronics. What have you got? Write to: Bob Briody, 140 West 57th St. (1 RE), New York 19, N. Y.

**FOR Sale:** 2 BC-611F Handie-Talkies, in excellent condition. W4MFW, Robert J. Moore, 402 Edgewood Avenue, Rome, Georgia.

**WANTED:** A U.I.F. Resonator 3-element or Telrex 5-element 20-meter beam. Also, a 66 ft. whip. John Wilson, W8ZWZ, Lawyer St Club, Ann Arbor, Michigan.

**WANTED:** ART-13 transmitters. Write James S. Spivey, Inc., 4908 Hampden Lane, Washington 14, D. C.  
**TOP!** Dollar paid for ART-13s, dynamometers, parts, racks and all other component parts. Write to Harjo Sales Co., 4109 Burbank Boulevard, Burbank, Calif.

**QSL'S? QSL'S? Get America's finest and largest variety super-gloss QSL samples, 25¢ (refunded). Sakkers. W8DED, Holland, Michigan. QSL's-SWL's Meade W9KXL, 1507 Central Avenue, Kansas City, Kans.**

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**QSL'S! Two colors, \$2.00 hundred. Samples for stamp, Rosedale Press, Box 164, Asher Station, Little Rock, Ark.**

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**W6HTN, Riesland, prints QSL'S. \$1.00 for 100.**

**QSL'S! Want 'em fast? Reasonably priced? Cleanly printed "Super speed Specials" are the answer. Dozen samples, 10¢. Robinson, W9AYH, Dept. U, 1281 Sacramento, Blue Island, Ill.**

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**QSL'S distinctively different. Postpaid. Samples free. Roland J. Dauphinee, W1KMP/6, Box 78374, Los Angeles 16, Calif.**

**BE Admired. Be recognized. Your call-letters on a beautifully finished Rhodium tie-bar, \$2.00. Val's, 22 Brookshire Road, Hyannis, Mass.**

**GONSET Communicator converted to new power supply for 12 volt ignition. New 12/11 volt Communicator with warranty, \$219.50 or your Gonset converted, \$24.50. Pacific Engineering Co., 839 N. June St., Los Angeles 38, Calif.**

**FOR Sale: 1 base station transmitter, 2 car transmitters and a number of different types of receivers for base station and cars. The transmitters are set at 24.58 Kcs. For information on these please write or contact Mr. Grover C. Harrison, Police Commissioner, Electra, Texas.**

**REAL bargains:** New and reconditioned Collins, National, Hallcrafters, Hammarlund, Johnson, Elmac, Gonset, Morrow, Rabcock, RME, Barker, Ely Williamson, Harvey Wells, Miller, Meissner, Lysco, Edico, Sonar, Central Electronics, others. Reconditioned S38, \$29.00; S38C, \$39.00; S40A, \$69.00; S40B, \$79.00; S76, \$129.00; SX71, \$159.00; NC57, \$59.00; NC88, \$79.00; NC98, \$119.00; NC125, \$129.00; NC173, \$149.00; HRO5A1, \$159.00; HRO60, \$189.00; 32V1, \$345.00; 32V2, \$445.00; Meissner EX, \$39.00; VHF152A, \$49.00; RME45, \$89.00; HQ129X, \$169.00; SX62, \$179.00; 75A1, \$279.00; 75A2, \$349.00; 75A3, \$429.00; Viking I, Viking II, many others. Shipped on trial. Easy terms. Satisfaction guaranteed. List free. Henry Radio, Butler, Mo.

**BARGAINS (with new guarantee):** R-9-e, \$14.95; Gonset Triband, \$27.50; S-72, \$59.50; S-38C, \$35.00; S-40, \$65.00; NC-57, \$65.00; RME-45, \$99.00; Lysco 600, \$109.00; S-27, \$99.00; SX-43, \$129.00; S-76, \$149.00; SX-71, \$169.00; SX-42, \$189.00; HRO-50, \$275.00; HT-17, \$32.50; DX Shifter, \$39.00; Hickok 198, \$30.00; 288X, Wells, Sr., \$69.00; DeLuxe, \$89.00; Viking I, \$209.50; New SS-75, \$189.00; HT-19, \$159.00; Globe King, \$275.00; 32V1, \$395.00; 32V2, \$475.00; 32V3, \$595.00. Free trial. Terms financed by Leo, W6GFO. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

**WANTED:** ART-13, DY-12, CU-25, BC-610, BC-614, BC-939, BC-729, BC-348, BC-342, BC-312, ARC-1, ARC-3, ARN-7, RTA-1B, TCS, Teletype, keyboard perforators, Boctone equipment, BC-221, L.M. TS test equipment, technical manuals, Signal Corps catalogs, APR-4, APR-5. Any parts for these sets. Cash or trade (will take any amateur or surplus equipment in trade) for new Johnson Viking, Ranger, Barker & Williamson, Hallcrafters, Hammarlund, National, Gonset, Elmac, Telrex, Central Electronics, Harvey Wells, etc. Terms: cash, 10% down, balance 30 days. Write to: J. J. Harrison, Box 19, Boston 1, Mass. Richmond 2-0048.

**CENTRAL Electronics 10B, \$139.95; Collins 32V1, modified, \$175.00; 32V3, \$595.00; Deltronic CD-144, \$129.95; Edico MD-40P, \$44.95, MT-2, \$39.95, MR-2, \$44.95; Elenco BSM-3, \$50.00; Hallcrafters S-38B, \$39.95; S-53A, \$64.95; SX-62, \$250.00; SX-71, \$159.95; HT-17, \$39.95; HT-18, \$75.00; SR-75, \$39.95; Heath AR-2, \$24.95; AT-1, \$24.95; Hickok 198, \$30.00; 288X, \$79.95; Harvey APS-50, \$29.95; TRS-50A, \$79.95; TRS-50C, \$79.95; TRS-50D, \$99.95; Millen 92101, \$17.50; 90800 19.95; National HFS, \$99.95; HRO-M, \$125.00; NC-46, \$69.95; NC-183, \$199.95; NC-1831, \$299.95; SW-54, \$34.95; RME DB-20, \$29.95; Sonar MR-3, \$39.95; other used items available. Free list from Carl, W1BFT, Evans Radio, P.O. Box 312, Concord, N. H.**

**FOR SALE:** All the equipment of W2NFU consisting of following: one transmitter running a Kw with pr. of 813s in final modulated by a 6X4, 6000 cycles, 1000 watts, 1000 cycles, 1000 cycles, 1000 cycles. All are mounted in a 6-ft. deluxe rack. One 522 transmitter and rcvr with a W1 Rey front end for continuous tuning; an "S" meter circuit is built-in and it has a high gain xtal stage in transmitter; all built into a 3-ft. deluxe enclosed rack. One Collins 75A-1 modified to the A2 by Winters Lab (factory rep). Assortment of parts, tubes, all equipment in excellent condition. Reasonable. Yr. reasonable offer will be refused. Reason for selling: moving to city apt. Sid Tritsch, 2 Center Dr., Flower Hill, Roslyn, L. I., N. Y.

FOR Sale: Moving! Transmitter, 1000 w. C.W. and F.M. 750 w. phone; shielded and de-TV'd final, pair of RK65s tetrodes, complete band-switching 10-75. Py-L network. Modulator 810s. Meissner signal shifter and FM unit mounted in Par-Metal rack; SX-25 receiver. Best offer \$2600. Merty, 3992 Clarke St., Seaford, N. Y. Tel. SUNset 1-4110.

WANTED: Collins 75A2 or 1 rcvr. Cash for best deal. Write to Fred W. Rudolph, Straker, Ohio.

FOR Sale: BC221, original circuit, calibration chart with instruction book and built-in V.R. A.C. power, \$65.00; Regen grid dipper (p. 473 of 1952 ARRL Handbook), coils, power and 3" 500  $\mu$ ma meter, \$15.00; Collins 310V-1 exciter for rack mounting with 5 band turret, plus extra speaker panel and speaker for side tone oscillator, \$195.00; 350V (after filter) 100 Ma., new plate dfrmr, \$3.00; dual 2-1/2 h., 100 Ma. exciter two in one casing, \$2.25; 2-5V 10A fil. xrmr \$2.50; Triplett mod., 3256 freq. meter, \$10.00; unused National 697 (similar to 5886 but for 25/60 cycle) power supply, \$8.00, W8NKK, Parker, 1240 Bedford, Detroit, 30, Mich.

WANTED: HRO-7 in tip-top condition, with coils, pwr supply and speaker. W. C. Johnson, WIFGO, Norwich, Vt.

SELL: Complete fixed and mobile ham station complete or in part: HQ129X receiver, Globe Champion transmitter coils for 10, 20, 75, antenna tuner, 10-meter Hy-Lite beam, rotator, 10 ft. tower. Babcock mobile DX-mitter mod. M15A with PS4A power supply, L-S antenna tuner, ElectroVoice 208 mike, Morrow SBR converter. Equipment in the very best condition. Must sell. Dick Giese, W8SGN, Withee, Wisconsin.

SALE: Underwood teletype, communications model, "mill." Good condition: \$45.00, W6ODD, Wilkerson, Box 776, Camarillo, Calif.

1.EICA: Focomat enlarger and complete dark room equipment. Want Viking I or II, W2JSM, 316 George St., Babylon, L.I., N. Y.

WANTED: An early model UV-203 RCA 50-watt tube to complete collection. Must be in good mechanical order, burned-out filament acceptable. Will buy for cash. Please advise your price. Paul Watson, 27 Price Street, West Chester, Pa.

SELLING out: 32V1 with spare final tube, \$325.00; 75A1 for \$225; Eldico Electronic bug, \$20; all in very good condition. E. T. Pennington, 202 Chestnut St., Huntington, W. Va., W8WUH.

RECEIVERS repaired and aligned by competent engineers, using factory standard instruments. Prompt service, at low cost. Our nineteenth year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

VIKING I, local, \$129. GF-12 transmitter, 4 sets coils, manual, \$16.00, W1TKW.

DRAFTED! NC-98, speaker, never used, original packaging, \$145.00. C.O.d. Grand Rapids, Mich. W8NQS, 309 Briarwood.

FOR Sale: Collins 310B exciter, like new, \$200. Unused Precision E-200-C AM signal generator, \$50.00. Five amp. Variac, \$9.00; Eico VTVM, \$15.00; unused 75 meter Amphenol antenna, \$5.00; Balun coils, mounted, \$3.00; coax antenna relay, \$5.00; Silver wave-meter, \$8.00; RCA Image Orthicon, \$7.00. George Kravitz, W2OTR, 7919 20th Ave., Brooklyn 14, N. Y.

FOR Sale: Johnson or Heath VFO, both wired for Viking II. Will sell either one. W9LQI, Boyd, Ashton, Ill.

FOR Sale: HRO-60, practically new, used less than 10 hours, perfect without a mark or fingerprint includes coils for all the bands, xtal calibrator. Guaranteed perfect. Will ship anywhere. A steal at \$393.00. Cooper, W9IOS, 901 S. 86th St., Omaha 3, Nebraska.

PRESERVE your operator's permit in Plastic! Billfold size, 25c. Hualmar Perma-Seal Service, 303 No. Tillotson, Muncie, Ind.

SELL: Gardiner "Type S" Automatic sender, good as new, with 10 original tapes, \$21.00 postpaid. John M. Scowcroft, W9HVH, 7739 Birch Drive, Hammond, Ind.

COLLINS 32V3, \$500; Collins 75A3, \$450. Both in original boxes, SS75, SSSB exciter with extra 807, 100 watts, \$175.00. Good reason for selling. All splendid equipment. W4ODK, 480 Skain Street, Lexington, Ky.

EVANGELICAL Missionaries, EX-W3KJV, grateful for old equipment. TVI no problem. Write David Hartt, Bananier, Guadeloupe.

SELL: 750 volt at .75 amp, Variac controlled and 300 volt at .1 amp, plus 6.3, 1.2, 25.2 volts filament power-chassis mounted power supply, \$29.95; WRL exciter 30 watts with one set of coils, \$18.95; Bendix TA-12D 100 watt, \$24.95; transmitter 160-40 meters, \$24.95. Prices include tubes, postage collect. Henry H. Harris, Jr., W4VPU, P.O. Box 1187 Charlottesville, Va.

FOR Sale: Used Instructograph code machine, A-C operated with oscillator and 10 tapes. First \$30 takes it. R. C. Cromer, 6673 Biscayne Avenue, Cincinnati 11, Ohio.

SELL: 750W, rig in 6 ft. closed relay rack, speech amp. 811s Cl. B, with 1500 v. supply, 2 RF units, 10 meters and 20-75, VFO, 807, 814 pp HF100s, 1500-2000 V supply; new tubes: three 304T1, two 866A, three 807, three VT127A, two 810, nine 826 and one 832A; one BC221AA. W. Asbury, 1185 Soundview Road, Huntington, N. Y.

FOR Sale: Elmac AF67 xmttr, Elmac PNR 6A rcvr, home-built supply for rcvr (Vibrator) Master Mobile all bander, top and bottom whip sections, used less than 20 hrs. \$250.00, W2PBC, RFD, Perry, N. Y.

IRE Proceedings 1953 and 1954 for sale. \$150.00 per year, W2EC, Thiede, 169 Buckingham Rd., West Hempstead, L. I., N. Y.

NEW Johnson Match-Box and S.W.R. bridge, \$42.50. W9ET, 210 Van Buren, Terre Haute, Ind.

SELL: Two-meter receiver and transmitter, deluxe rack and panel, conversion of SCR-522, separate power supply, single-switch relay controlled, metal, xtals, mike, 8-element Hy-Lite beam, built-in speaker, schematic, spare xmitter for parts, complete station ready to operate, nothing else to buy. \$95.00 takes all. W2NGR, 61 Henry St., Merrick, L. I., N. Y.

GROUND-ED GRID 304th final amplifier as described in this issue. Complete equipment includes power supply (plate and bias) plus 350 watt 304TH bias shift modulator, all fully metered, with tubes, \$350. W0VPI, 8506 Broadmoor, Omaha, Nebr.

FOR Sale: 400 W. 6AG7-2E26-813, pi network rig, no TVI, \$75; BC453 converted with power supply, \$20.00; BC459 converted, no TVI, \$20. Ralph J. Roode, W8SNJ, Worthington, Ohio.

RADIO Diagrams \$1.00, Television \$2.00. Give make, model, Diagram Service, 672-St. Hartford 1, Conn.

FOR Sale: Power supply 2500 V, DC 900 KVA, \$35.00. F.o.b.; Escanaba, Paul Eden, W8K2I, Escanaba, Mich.

FOR Sale: Eldico TR75TV xmitter, good working condn. K6BBD. SELL or trade: Conservatively rated 350-watt Onan gasoline generator, 110V, 60 cps plus 12 VDC automatic start. Pulled Viking and receiver for field day. Want mobile gear or cash, W0PVY, 1908 Vermont, Lawrence, Kansas.

SELL or trade: Model 26 teleprinter with table, condition excellent; HRO Sr. receiver with coils and power supply, condition fair, J. W. Knoche, W4LCR, 118 N. Cove Terrace Dr., Panama City, Fla.

JOHNSON rotator complete with control box direction indicator, instruction book and 100 feet multiconductor operating cable. Best offer over \$195.00 F.o.b. W5DA, 4425 Bordeaux, Dallas, Texas.

WANTED: Harvey-Wells Senior and VFO, current models. Give details and price. WIDV, Box 328, Norwell, Mass.

USED PE-75, 2500 watt, 120 volt, single phase, 60 cycle A.C., \$195.00, F.o.b. San Antonio, Texas. W5EDN, 645 E. Woodlawn.

TUNGER Battery chargers wanted, 2 and 6 ampere sizes. W1BB, FOR Sale: Complete GE diathermy, \$25. Electrostatic tweeter, \$4.00. Wanted: Mobile equipment, Oliver Nash, Sanford, Mich.

COLLINS 75A-2 in top condition with matching speaker, 8R-1 callibrator, 148-C-1 FM adapter and manual, \$330. W2GAU, New York City. MO 6-2276. Purchaser pays any crating or shipping charges.

FOR Sale: SX-71 receiver, \$150; Pentron 9T3 tube recorder, \$75; Eico 425K scope, \$35; Johnson Viking mobile VFO, \$25; Crystalizer with 10 crystals, \$15; Heathkit VTVM, \$15; all in excellent condition. Philip Schwebler, Jr., W2ZHE, Alcove, N. Y.

FOR Sale: Collins 30K with 310 exciter completely TVT'd. Spare final tube and spare modulator tube, \$1,000. F.o.b. Waco, Texas. W5KAU, 2323 N. 39th St.

STILL the biggest list of ham gear for a three-cent stamp. Receivers, transmitter, parts, meters, rotators, the accumulation of a lifetime. Want coax switches, relays, rotary inductors, Collins 75A3, cash or trade. W0ERU, 2511 Burrmont Road, Rockford, Ill.

WANTED: 250-300 watt modulator or parts. Paul Powell, 801 Matamoros, Laredo, Texas.

VIKING I Transmitter, in excellent condition, complete TVI, \$150.00. Cannot pack or ship. Ernest E. Plant, W2GDL, 47-37 189th St., Flushing, N. Y. Flushing 7-7510.

SELL: Eldico TR75-TV transmitter with coils for 10 through 80 meters, \$45.00; Eldico 40-watt modulator, \$30.00; Meissner EX VFO all bands, \$50.00. All equipment in excellent condition, Paul Juliff, W1SWO, Choate School, Wallingford, Conn.

COLLINS 32V-3, fine condition, \$565. W0VTP, 8506 Broadmoor Dr., Omaha, Nebr.

NEW Crystals for all commercial services at economical prices; also regrinding or replacement crystals for broadcast, Link, Motorola, G. E. and other such types. Over 19 years of satisfaction and fast service. Send for L-7 catalog. Eidson Electronic Co. Temple, Texas.

MORROW SBR, newest, used a few hours, \$64.00; \$40A and SM40 "s" meter, gnd condn, \$63. Sylvan TR2-144, new 2-meter 100 watt trans., \$25; Pads FM tuner, new, \$15, same used, \$12. Want SP44 Panadapter and mod. trans. for pr 811A or 5514. W2HDR, John A. Schwerbel, 111 W. Hoffman Ave., Lindenhurst, L. I., N. Y.

SELL: QSTs 1925-1939 inclusive except for 4 issues, in excellent condition, make offer; HRO B.C. coil, \$5; four 24G's, \$1.00 each; 4A A-13 Mod. trans., \$100V, \$7.50; 5 Mc. xtal, \$2.50. D. L. Robinson, 1609 Westview Drive, New Kensington, Pa.

FOR Sale: Collins 32V1 transmitter, \$300. Approximate 500 watt final transmitter with modulator, best offer. Audio amplifier, 60 watt, \$30; Elmac A54 transmitter with power supply, \$100; Elmac PMR 6A receiver with power supplies, \$100. Goldie Farrell, 912 Noyes Ave., Hamilton, Ohio. Phone 4-6780 or 3-6557.

PRINTED Circuits: Make your own etched wiring for transmitters, receivers, etc. Simple process. No silk screens or photographic plates. Kit contains all materials and illustrated instructions. Send \$2.95 now. Felix Dutko, 2078 Vyse Ave., Bronx, N. Y.

SELL: Variacs, 5 amp, \$5, 45 amp, \$50; new BC-459A, BC457A, \$5. All trans., 1000, 65 amp, \$10; Mine detector SC825, \$30. ARCA Rk. TX, \$20; 75 meter mobile station, \$90; Thordarson 21M64 300W mod. xfrmr, \$20; HQ129X, NC4173, Wand 75A, W6WZD.

FOR Sale: Elmac AF-67, \$145; Gonset Super Six, \$42; both two weeks old, used only 1/2 hour. A steal. . . . Also PE103, \$14; 660 all-bander coil, \$11.00, W8NYA, Laferty, 917 South Shore, Holland, Mich.

SELL: HQ129X, Gonset Communicator with squelch, Telrad frequency standard, unmodified BC522 receiver, modified BC522 receiver, AR-13 Mod. trans., 100V, \$7.50; National oscilloscope with internal sweep circuit. Best offers, W2DCQ.

SELL: Navy long wave receiver 600 to 15 Kc, \$35.00, W4OF.

FOR Sale: 450TH and 808 power tubes, new, never used. Other equipment also. Write Donald Pratt, Harpersville, N. Y. CRYSTALS: FT-243's, 3500 to 870 Kc  $\pm$  5 Kc, \$1.00 each. All C.A.P. frequencies. Prices range like 4507.5, 4385, 4467.5, 8008.2, 8230, \$2.50 each, .005% setting. Hundley Crystal Co., 2951 North 36th, Kansas City 4, Kans.

A.C. Instructograph, 10 tapes, built-in oscillator, instructions. Hardly used. Best offer over \$35.00. K2GMA, Michael August, 10 Rahway Rd., Millburn, N. J.

SELL: AR-13, modified, 110v. power supply. Emission switch controls remote 24VDC, 24 VAC, 450V, 1500 V @ 500 mill supplies. Complete with spare 813, 1625, Tech, manual, schematic showing modifications, power supply, cable connections, de-TV'd. On air. Best offer. SCR-522 with tubes, \$35.00, BC-342, new paint, knobs, markings. Rear connections for speaker, converter, antenna, ground, send/receive. Modified per QST Sep. 46. Best offer, J. R. Divers, Jr., W4JVM, Rt. 4, Chattanooga, Tenn.

SELL: Johnson Viking II factory-wired and VFO 1 1/2 year old. In A-1 condition, \$310. Ernest Nettum, W0PVG, Kindred, No. Dakota.

FOR Sale: TR-75TV coils, 10, 20, 40, extra grid coil, \$40; MB-40, unused tuner, \$9; JCX50E, \$5; DM-36B, 6-10 converter, \$13; \$14.50, \$2, \$5, \$1.50; W5RJB, Seyler, 3286 Rinda Lane, Cincinnati 22, Ohio.

REFLECTORIZED aluminum call sign. Regular \$1.50. Jumbo, \$2.00. Lawn state, \$2.75. Overnight shipment. Whitley, W2LPJ, 133 Airsdale Ave., Long Branch, N. J.

NC-125 receiver, LYSCO 600 xmitter (no TVI), Clampmaster modulator and antenna coupler for highest bidder over \$200. WIBML, LeRoy Flatt, 19 Vernon Rd., Natick, Mass. Phone OL-38891.

SELL: 400-watt complete transmitter, 35Ts P.P., 6-ft. rack, \$150. R. Julien, Maryknoll P.O., N. Y.

VIBRAPACKS: Navy surplus, 6V input, 250v at 165 Ma. output. Filtered, fused and with control relay. New, \$15.95. Kit of basic components to build above unit, less chassis with diagram, \$6.95. Drillick Electronic Sales Co., 5279 W. Pico Blvd. Los Angeles 19, Calif. Tel. WEbster 1-9202.

NOVICES: Hallcrafters S-38B. Good condition, \$25. Dave Lifton, 140 Beach 135th St., Rockaway Beach, L. I. N. Y.

DANGER! High Voltage! embossed metal signs, 3" x 12", baked enamel colors, \$1.00 each. W9WFT, Lackner, 2029C Bradley, Chicago 18, Ill.

TRANSMITTER 300 watts PP35Ts spares, relay rack enclosed cabinet, coils for 40, 20 and 10 Class B modulator, separate preamp, \$100. Make an offer local. Meck T60 xmitter, 60 watts, 10-meter coils. Phone or c.w., \$50. Val Brygnak, W8VDF, 668 E. 130th St., Cleveland 8, Ohio.

FOR Sale: NC98 revr, in original carton. First \$100 takes it. Dom Garofano, W3VMJ, 4332 Germantown Ave., Phila., 40, Pa.

LONG Island Hams! We have moved to a larger store! It's easy to get to. Plenty of parking space. Lots of bargains. Trade-ins taken. Algeradio Electronics Co., 236 N. Franklin St., Hempstead, L. I., N. Y.

TAPE Recorders accessories, Hi-Fi phonographs. Exceptional values. Cerston, 215 East 88th NYC 28.

FOR Sale: HT-9 with VFO, \$150; BC348 MOD for 110V, \$90; 851 vac tube, \$30; 67" black enclosed xmitter cabinet, \$25; 1 KW 11 v. fil. xformer, \$20; Gonset 10/11 converter, \$20; list of other old-style xmitter parts, meters, cords, xfrms, ckt bkrs and inst. Bks available. Want SSB equip. Lt. Col. Hiler, W2SQ/4, 280 Coral Drive, Eau Gallie, Fla.

FOR Sale or trade: Globe Scout 50-watt phone/c.w. transmitter. Used less than one year and complete with Balun coils and microphone. Completely bandswitching 160-10 M, \$85; T-69-20A Motorola 10M mobile transmitter including power-supply, control box and microphone, \$15.00. Gonset 10M converter, \$12.00. R. Hanson, 4609 Drew Ave., So., Minneapolis 10, Minn.

FOR Sale: NC-125, brand new, with spkr, \$130; Viking Ranger, complete with tubes, ready to operate, \$265, both for \$375. Eicor 5.8 volt 425 volt 375 Ma. dynamotor, new, \$20; five (5) 44td. 6000-volt filter condensers, \$12, each five, \$50. Neill A. Jennings, W4NWW, 1714 Friendly Road, Greensboro, N. C.

WANTED: Johnson or Mims rotator, complete. Panoramic adaptor, 3000/4000 volt filter condensers. Sell or swap: 450TLs, Eico VTVM DuMont 3" scope, LM, VHF152A, BC348, 805s, 4D32, 4-125A, 813s, Collins MBF. King, W7NRB, Box 488, Kirkland, Washington.

VIKING Ranger, like new, \$175. Will not ship. John Warner, W8GPT, West Unity, Ohio.

BC221 with chart, excellent, \$125. Meissner shifter, Model EX1 clean and stable, \$45. RME 10 and 5 converter, unmodified Mode DM36 like new, \$25. BC312, fair condition, \$25. Prices F.o.b. P.O. Box 691, Woodcliff Lake, New Jersey, or phone Parkridge 6-0591M.

SELL: BC-654, \$25; NC-183-R, \$185; 21A Teletype midjet tape printer with wiring diagram, \$45; Dumont #241 scope, \$275; Collins 30-J, 600 watt input phone and c.w. crystal controlled; 2-60 MC., \$30; NC-125, \$145; NC-100X, \$95; RHM 12 000 ohm relays, \$1.75. Want: ART-13, ARC-1, DY-12, BC-221, BC-342, APR-4 tuning units, technical manuals. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. Richmond 2-0916.

WANTED: Late model Gonset or Elmac mobile transmitter and receiver. Dr. Roger West, W4CPQ, P.O. Box 2423, Norfolk 1, Va.

HARVEY-WELLS DeLuxe TBS-50D with Bandmaster VFO, HB. power supply, Astatic JT-30 mike, Hallcrafters S40A, 75-watt antenna tuner w/10, 20, 40 and 80 JCL coils and changeover relay. All excellent condition. Best offer over \$200 or will trade on Viking II. Wm. C. Harnsberger, W4ZNT, 126 Shamrock Rd., Charlottesville, Va.

VIKING II, factory-wired, new in appearance and in first class condition, \$275. Fred E. Norton, 1450 Winchester Dr., Muskegon, Michigan.

Q5'ER, McMurdo-Silver, with power supply, \$18.00; Gonset Tri-Band, perfect, no holes, \$30; Stancor P-4086 transformer, 5 volts, 14 amperes, 10,000 volt insulation, \$11.00; unused 813s, \$7 or trade for 304TLs. W. T. Curtis, W21WS, R.D. #1, Jamesville, N. Y.

ALL models Elmac receivers, transmitters, power supplies in stock. All c.w. now c-a-c-a-y, beams, 6 and 12 volt dynamotors, \$29.50. Bob Wolfe, W3HDT, Bob Wolfe Electronics, 2506 Hoffman St., Baltimore 13, Md.

CLEANING house! Mobile equipment, NRI xmitter, BC454B with 110v. supply, components, etc. Write for list. W9FXD, Van Vickle, Box 25, Mount City, Mo.

SELL: Hallcrafters S-76 receiver with R-46 matching speaker, new, in perfect condition. Make an offer. Allan Turpin, W4ZXU/6, Deep Springs College, via Dyer, Nevada.

WANTED: All tubes, receiving, transmitting and industrial. Lab test and TS equipment and Selsyns. Carrier equipment CF-1A, CF-4, repeater CF-5, ARC3, BC221, BC610, BC611, BC614, BC729, BC939, BC739, BC191, BC375, BC131 and all tuning units. "TAB" 111 Liberty St., New York City.

BC-458 converted for 75-80 or 40 meters with modulator, power supply, either rig, \$50. New pair 813's, \$15.00; new 4D22, \$10; parts for pair of 811 modulators, includes AN/ART-13 transformers; misc. parts, power supplies, etc. Cleaning out at give-away prices. Seidman, W2GNZ, 1535 Longfellow, Bronx, N. Y.

FOR Sale: Signal slicer, \$37.50. Eico VTVM, \$22.50. HS33 headset, no plugs, \$1.25 each. Send for list of other parts. Want National ML40BS, W3FKI, E. Aicher, 737 Pine, Steelton, Penna.

SALE: 32V3, in tip-top condx. Little used, \$595. W3WPM, Col. F. L. Moore, Hq. AACs, DCS/O, Andrews AFB, Washington 25, D. C.

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## The No. 90901 One Inch Instrumentation Oscilloscope

Miniaturized, packaged panel mounting cathode ray oscilloscope designed for use in instrumentation in place of the conventional "pointer type" moving coil meters uses the 1" 1CP1 tube. Panel bezel matches in size and type the standard 2" square meters. Magnitude, phase displacement, wave shape, etc. are constantly visible on scope screen.

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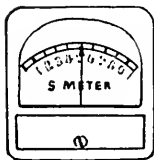
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## A good microphone can improve your results as much as a high gain antenna



Ever notice that two signals of the same "S meter" intensity sound differently? One is muddy, dull, a little hard to read—the sibilant letters like S and F almost alike. The other signal is sharp, clean and readable even in QRM and QRN—because there's usable intelligence. No mistake about the call or comments.

The greatest variation is in the microphone. A sharp peak adds no intelligibility but limits the modulation to that value. A peak of, say 6 db, which is usual in many ordinary microphones, will reduce voice power by HALF. Don't be fooled by a microphone that sounds "louder"—loudness by itself is not a criterion of performance; quite the contrary since it may indicate undesirable peaks.

An E-V microphone with smooth, peak-free response, replacing an inferior instrument, often will do more for a phone signal than a new antenna or increased power. As a further *plus*, of course, you get well-known E-V durability, style and performance. An E-V microphone, to raise stations, to carry through a QSO, is your best station investment.

Shown above are a few of the E-V microphones designed for effective communications. Amateur discount applies.

(upper left) Model 611 high output dynamic and Model 911 crystal. On-Off switch. List from \$25.50 to \$37.50

(upper right) Model 950 Cardax high-level crystal cardioid, with dual frequency response. On-Off switch. List, \$42.50

(lower left) Model 630 wide range, high output dynamic, with exclusive Acoustalloy diaphragm. On-Off switch. List, \$47.00

(center) Model 636 "Slimair" wide range dynamic. Pop-proof head. Acoustalloy diaphragm. On-Off switch optional. List, \$70.00

(lower right) Model 623 slim-type high output dynamic, with E-V Acoustalloy diaphragm. On-Off switch. List, \$49.50. Also Model 926 crystal, less switch and connector. List, \$24.50

(Other E-V microphones for mobile and aircraft communications, telecasting, broadcasting, recording, and public address.)

For further information,  
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Covers 540 kcs. to 40 mcs. in 4 bands

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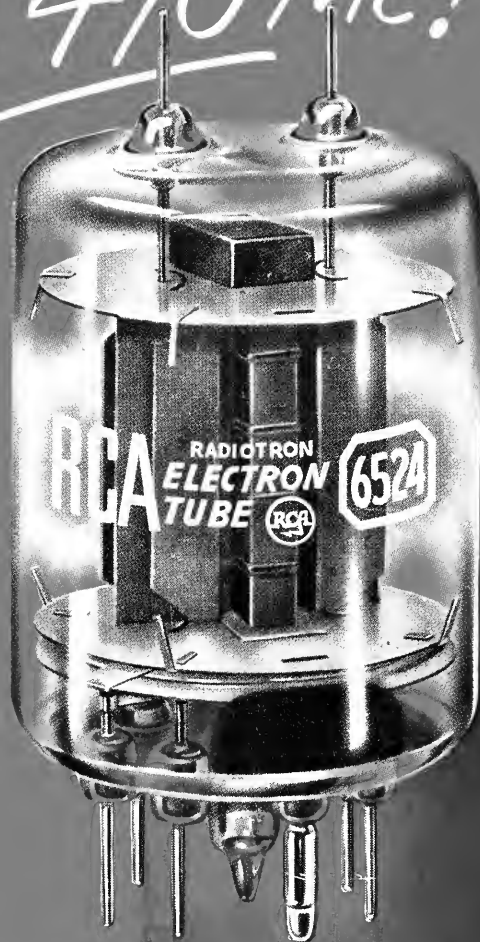
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A new, low-cost twin beam power tube for "ham" use in the 420-450 Mc band

**RCA-6524—Max. Plate Input and Voltage vs. Frequency (Push-pull, Class C Operation)**

Service (ICAS)	Frequency Band Mc	Plate Input Watts	Plate Voltage (Volts)
Plate-Modulated Telephony	144-148	49	435
	220-225	44	370
	420-450	31	300
Telegraphy (CW)	144-148	78	540
	220-225	68	460
	420-450	47	380
Frequency Tripler	144-148	46	380
	220-225	40	370
	420-450	35	370

If you are planning a new rig for fixed or mobile operation in the 420-450 Mc range, the new RCA-6524 is the tube you want. The high power sensitivity and high efficiency of the 6524 permit operation with moderate plate voltages to give large power output with small driving power. In cw service, the tube will take 45 watts input (ICAS) at 470 Mc. (See table for Ham-Band ratings.)

Design features of the 6524 include balanced compact beam power units which have low interelectrode capacitances, and a cathode common to the two units to reduce cathode inductance to a minimum. High-conductivity seals and short, heavy, internal leads minimize rf losses.

The 6524 is available now. Ask your local RCA Tube Distributor about it. For technical bulletin, write to RCA, Commercial Engineering, Section A37M, Harrison, New Jersey.



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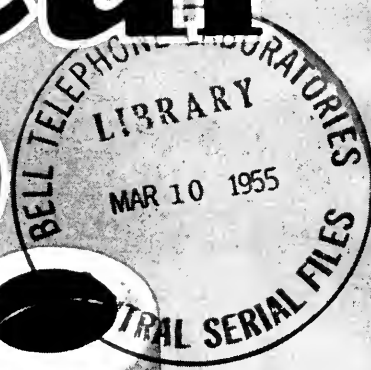
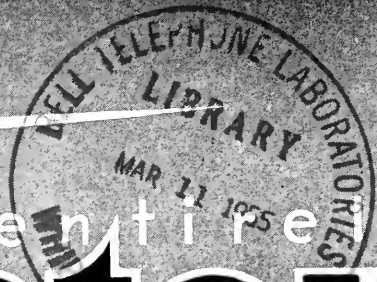
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4/7

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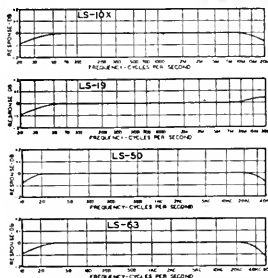
## TYPICAL UNITS

### LINEAR STANDARD series

Linear Standard units represent the acme from the standpoint of uniform frequency response, low wave form distortion, thorough shielding and dependability. LS units have a guaranteed response within 1db. from 20 to 20,000 cycles.

Hum balanced coil structures and multiple alloy shielding, where required, provide extremely low inductive pickup.

These are the finest high fidelity transformers in the world. 85 stock types from milliwatts to kilowatts.



#### LS-10X Shielded Input

Multiple line (50, 200, 250, 500/600, etc.) to 50,000 ohms ... multiple shielded.

#### LS-19 Plate to Two Grids

Primary 15,000 ohms.  
Secondary 95,000 ohms C.T.

#### LS-50 Plate to Line

15,000 ohms to multiple line ... +15 db. level.

#### LS-63 P.P. Plates to Voice Coil

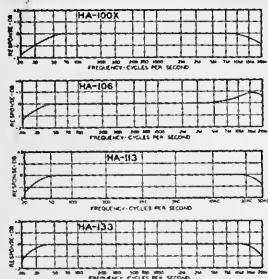
Primary 10,000 C.T. and 6,000 C.T. suited to Williamson, M.L.F., ul-linear circuits.  
Secondary 1.2, 2.5, 5, 7.5, 10, 15, 20, 30 ohms. 20 watts.



CASE	LS-1	LS-2	LS-3
Length	3 1/4"	4-7/16"	5-13/16"
Width	2 5/8"	3 1/2"	5"
Height	3 1/4"	4-3/16"	4-11/16"
Unit Wt.	3 lbs.	7.5 lbs.	15 lbs.

### HIPERMALLOY series

This series provides virtually all the characteristics of the Linear Standard group in a more compact and lighter structure. The frequency response is within 1 db. from 30 to 20,000 cycles. Hipermalloy nickel iron cores and hum balanced core structures provide minimum distortion and low hum pickup. Input transformers, maximum level +10db. Circular terminal layout and top and bottom mounting.



#### HA-100X Shielded Input

Multiple line to 60,000 ohm grid ... tri-alloy shielding for low hum pickup.

#### HA-106 Plate to Two Grids

15,000 ohms to 135,000 ohms in two sections ... +12 db. level.

#### HA-113 Plate to Line

15,000 ohms to multiple line ... +12 db. level ... 0 DC in primary.

#### HA-133 Plate (DC) to Line

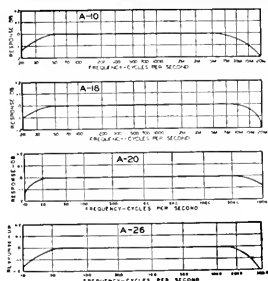
15,000 ohms to multiple line ... +15 db. level ... 8 Ma. DC in primary.



Case	H-1	H-2
Length	2 3/4"	3-9/16"
Width	1-15/16"	2-13/16"
Height	3 1/4"	3 1/2"
Unit Weight	2 lbs	5 lbs.

### ULTRA COMPACT series

UTC Ultra Compact audio units are small and light in weight, ideally suited to remote amplifier and similar compact equipment. The frequency response is within 2 db. from 30 to 20,000 cycles. Hum balanced coil structure plus high conductivity die cast case provides good inductive shielding. Maximum operating level is +7db. Top and bottom mounting as well as circular terminal layout are used in this series as well as the ones described above.



#### A-10 Line to Grid

Multiple line to 50,000 ohm grid.

#### A-18 Plate to Two Grids

15,000 ohms to 80,000 ohms, primary and secondary both split.

#### A-20 Mixing Transformer

Multiple line to multiple line for mixing mikes, lines, etc.

#### A-26 P.P. Plates to Line

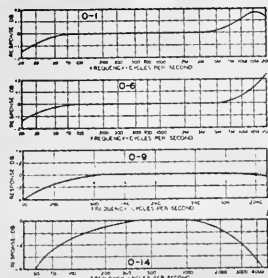
30,000 ohms plate to plate, to multiple line.



A CASE  
Length ..... 1 1/2"  
Width ..... 1 1/2"  
Height ..... 2"  
Unit Weight ..... 1/2 lb.

### OUNCER series

UTC Ouncer units are ideal for portable, concealed service, and similar applications. These units are extremely compact ... fully impregnated and sealed in a drawn housing. Most items provide frequency response within 1 db. from 30 to 20,000 cycles. Maximum operating level 0 db. These units are also available in our stock P series which provide plug-in base. The O-16 is a new line to grid transformer, using two heavy gauge hipermalloy shields for high hum shielding.



#### O-1 Line to Grid

Primary 50, 200/250, 500/600 ohms to 50,000 ohm grid.

#### O-6 Plate to Two Grids

15,000 ohms to 95,000 ohms C.T.

#### O-9 Plate (DC) to Line

Primary 15,000 ohms, Secondary 50, 200/250, 500/600.

#### O-14 50: 1 Line to Grid

Primary 200 ohms, Secondary .5 megohm for mike or line to grid.



OUNCER CASE  
Diameter ..... 7/8"  
Height ..... 1-3/16"  
Unit Weight ..... 1 oz.

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150 Varick Street, New York 13, N. Y. EXPORT DIVISION: 13 E. 40th St., New York 16, N. Y. CABLES: "ARLAE"



## All G-E Tubes get individual tests to assure maximum dependability!

**Q**UALITY-CONTROL sampling isn't enough—though G-E standards for this lead the industry. *Every* General Electric tube is checked for important operating characteristics.

Instrument dials say if the tube plate current is correct . . . if transconductance equals the prescribed value . . . if no undesirable reverse current flows in the grid . . . if there is no tube short, open circuit, or vacuum leak.

G-E tubes that pass these individual tests, must run the gauntlet of quality-control checks for over-all satisfactory performance. Are microphonics at a minimum? Does life-testing leave tube characteristics unchanged? Only if the

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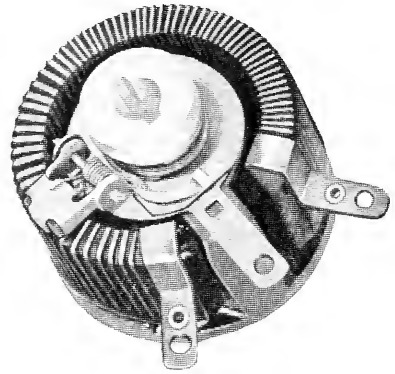
★ ★ ★

General Electric congratulates the winner of the 1954 Edison Award, Benjamin S. Hamilton, W6VFT, La Mesa, California. The judges named Mr. Hamilton as the amateur whose achievement was most noteworthy, because he provided San Diego County, California, with "an outstanding Civil Defense and disaster-emergency radio network". Recognition given to Award-winner W6VFT and to others whom the judges cited, was equally a tribute to the public-spirited efforts of radio amateurs everywhere.

**GENERAL**  **ELECTRIC**

# MALLORY HAM BULLETIN

## Mallory Type "K" Rheostats for 25 to 500 watts



In the course of experimental work, you occasionally run into a spot where you need a power rheostat or high-wattage voltage divider. When you do, we believe that Mallory Type "K" Vitreous Enamel Resistors will give you performance comparable to that which you have been getting from other Mallory wire-wound controls in lower wattages. This series is available in a complete range covering ratings from 25 to 500 watts.

One of the first things you will notice about the Series "K" control is its smoothly operating sliding contact, mounted snugly in its unique, spring-loaded and hinged carrier.

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Perhaps the most outstanding feature of this whole assembly, however, is its construction which allows the contact to be lifted from the resistance element for cleaning purposes without distorting or disturbing the applied force. Incidentally, the contact is almost as easy to replace as the brushes in a small electric motor.

The spring collector and shaft assembly is spring-

loaded to assure virtually constant electrical conductivity for the life of the control. In addition, all Series "K" controls above 25 watts are equipped with a copper-graphite buffer plate as a part of the collector assembly to reduce erosion as well as assure positive electrical contact. The shaft is centered and insulated from the electrical circuit by means of a high quality steatite bushing.

The body of each Series "K" control is formed from electrical grade porcelain and each turn of the resistance winding is uniformly wound on this form to provide an even progression of resistance change vs. shaft rotation. A non-alkaline, non-hygroscopic enamel is applied carefully to the winding, and then heated to a hard, glass-like finish for maximum protection to the vulnerable parts of the winding.

The smaller sizes, 25 through 150 watt, are equipped with conventional threaded bushings for panel mounting; sizes above 150 watt are equipped with set screws. All sizes have panel locating lugs which may be adjusted for universal mounting. Suitable knob and dial plate are supplied with each.

A brochure containing dimensional drawings of these controls, plus catalog listings, has been prepared. For your copy, write to us at Box 1558, Indianapolis 6, Indiana. Meanwhile, check with your Mallory Distributor, and take a good look at these power controls. Their construction alone will inspire confidence in their ability to operate properly for a long, long time.

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P. O. Box 1558  
INDIANAPOLIS 6 INDIANA

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# QST

MARCH 1955

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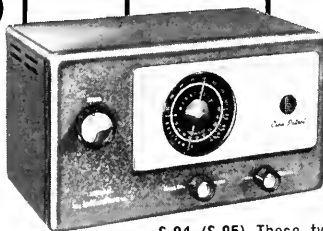


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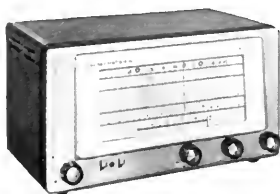
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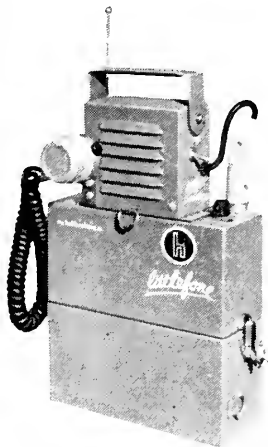
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**Reports Invited.** All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in QST. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. *All amateurs in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).*

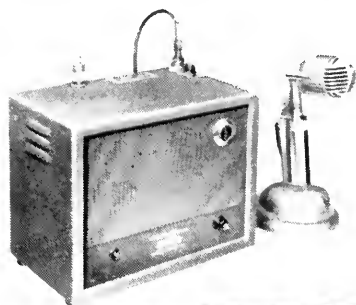
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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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## FCC's 20TH ANNIVERSARY

The Federal Communications Commission last year marked its 20th anniversary of existence as the federal agency regulating all forms of radio and wire communication.

Old-timers will recall that most radio matters were administered by the Department of Commerce prior to 1927; the Radio Act of that year created a Federal Radio Commission, with duties obvious from its name. Our affairs were handled by FRC until the Communications Act of 1934 designated a Federal Communications Commission to take over radio regulation from FRC, and to have in addition responsibility for wire telephone and telegraph matters. The 1934 change had no particular effect on amateurs or on radio in general, for it was simply administration by substantially the same Commission and staff as FRC. The anniversary seems an appropriate one to look back to our regulatory status two decades ago.

The new Commission inherited from FRC (in reality, from itself!) a fairly sound set of amateur regulations — they having been completely revised, in consultation with the League, a year earlier. It was also an extremely simple text; that the one printed page of regulations existing slightly more than 20 years ago has grown to more than 10 pages of fine print today is a measure of the increasing complexity of even the amateur phase of the art.

In June, 1934, there were 46,390 amateur radio operators; today there are approximately 125,000. In those days licenses were issued in Classes C, B or A for three-year terms, a relatively new set-up from the earlier one-year licenses of the generally-comparable Temporary, First Class, and Extra First Class tickets. (Comparable, that is, except for the Temporary certificate, which like our present Novice license had a one-year nonrenewable term.) There were 32 quarterly examination points, compared with 61 at present (plus thousands more volunteer amateur examiners under our current procedures.)

The code speed was 10 w.p.m. and you had to copy the text in longhand — no printing. One year's experience was required before taking the Class A test, which license entitled

you to the delights of voice operation in 3900-4000 (that's as big as the 'phone band was) and 14,150-14,250 kc. A commercial 'phone license waived the technical exam. Flunking any exam made you wait 90 days before tackling it again — it's now 30 days. The power limit, as always, was a kw. If you used any of the bands below 14.4 Mc. you had to put a filter on your power supply, but raw a.c. was permissible above that point. It is worthy of note that we had "gone d.c." for even the lower bands only a few years earlier. You could operate mobile only above 56 Mc. (meaning, in effect, the 56-60 Mc. band), and *only* in aircraft — there was no mobile operation as we know it today. The license automatically granted portable privileges in any band, but this was also a brand new regulation; only a year earlier separate portable licenses and calls were required for such operation.

The bands were:

1715-2000 kc.  
3500-4000 kc.  
7000-7300 kc.  
14,000-14,400 kc.  
28,000-30,000 kc.  
56,000-60,000 kc.

You could also operate anywhere above 110 Mc.; no one else was using those "microwaves" in 1934. But it was pretty tough to generate any r.f. with gear then available; even to get to 56 Mc. a lot of hams were removing "lossy" bases from tubes.

For 'phone operation any amateur could use:

1800-2000 kc.  
28,000-28,500 kc.  
56,000-60,000 kc.

with the Class A boys additionally entitled to 75- and 20-meter voice. You could transmit music if you were engaged in bona fide tests of modulation gear.

In the interests of strict accuracy, we should point out that amateurs were assigned one additional band: 400,000-401,000 kc. To our knowledge no amateur ever had a QSO there. As the story goes, the band was earmarked for us, years and years ahead of any possible practical use of that territory, because that frequency was calculated (erroneously, as it turned out) as one for which the parabolic



reflector of the common electric heater could be used for beam purposes.

It should be noted that the few differences between the over-all band limits above and those we have today are largely a result of international regulatory agreements and not arbitrary rulings by the Commission; FCC has always assigned amateurs in this country practically every kilocycle permitted under international treaty. In the formation of the U. S. viewpoint toward international regulation the Commission has been an unqualified supporter of the amateur, as of course have most other Government agencies concerned. In this field during the last twenty years we recall particularly the 1936 FCC hearings, looking toward the Cairo world conference of 1938, and the 1944 hearings, looking toward the Atlantic City conference of 1947, at both of which — as in every conference since 1927 — amateur radio was practically on trial for its life. We know, with pardonable pride, that the testimony put into the records on behalf of amateur radio established pretty thoroughly our right to continued use of our frequencies because of our record of operation in the public interest, convenience and necessity. Yet many of the contributions of amateur radio are intangibles, and it is indeed a rare group of men who are possessed of sufficient wisdom and vision to weigh these against the hard and cold facts and statistics of the commercial users, and come up with the answer they have.

The progress that amateur radio has made these past twenty years could never have been made without the help and coöperation of a Federal agency, representing the established Government viewpoint toward encouragement of scientific endeavors on the part of its citizens as an advancement of the national interest and culture. To the Commission as an agency, the League extends its sincere appreciation. Equally as important, to the many individuals on the staff who have over these years worked in our interest, the League on behalf of all amateurs extends its warm thanks.

## OUR COVER

Nowadays accurate frequency checking is an important responsibility of every amateur. The secondary frequency standard shown on this month's cover is designed for just that purpose, as well as being compact and economical. It is capable of supplying 50-ke. check points throughout the communications spectrum. In addition, it can be used with high-frequency crystals for identification of the points. The unit is described in detail starting on page 14 of this issue in "Frequency Marker with 50-Kc. Intervals."

The author, Beverly Dudley, ex-9BR, is now editor of *The Technology Review* at the Massachusetts Institute of Technology. A former ARRL staff member, Mr. Dudley was an Assistant Technical Editor of *QST* just twenty-five years ago!

## WHAT BANDS AVAILABLE?

Below is a summary of the U. S. amateur bands on which operation is permitted as of February 15th. Changes will, as usual, be announced by W1AW bulletins. Figures are megacycles. A0 means an unmodulated carrier; A1 means c.w. telegraphy; A2 is m.c.w.; A3 is a.m. 'phone; A4 is facsimile; A5 is television; F1 is frequency-shift keying; n.f.m. designates narrow-band frequency- or phase-modulated radiotelephony; and f.m. means frequency modulation, 'phone (including n.f.m.) or telegraphy.

3.500-4.000	— A1
3.500-3.800	— F1
3.800-4.000	— A3 and n.f.m.
7.000-7.300	— A1
7.000-7.200	— F1
7.200-7.300	— A3 and n.f.m.
14.000-14.350	— A1
14.000-14.200	— F1
14.200-14.300	— A3 and n.f.m.
11.300-14.350	— F1
21.000-21.450	— A1
21.000-21.250	— F1
21.250-21.450	— A3 and n.f.m.
26.960-27.230	— A0, A1, A2, A3, A4, f.m.
28.000-29.700	— A1
28.500-29.700	— A3 and n.f.m.
29.000-29.700	— f.m.
50-54	— A1, A2, A3, A4, n.f.m.
51-54	— A0
52.5-54	— f.m.
144-148	A0, A1, A2, A3, A4, f.m.
220-225	
420-450 <sup>1</sup>	A0, A1, A2, A3, A4, A5, f.m.
1.215-1,300	
2,300-2,450	A0, A1, A2, A3, A4, A5, f.m., pulse
3,300-3,500	
5,650-5,925	
10,000-10,500	
21,000-22,000	
All above 30,000	

<sup>1</sup> Peak antenna power must not exceed 50 watts.

In addition, A1 and A3 on portions of 1.800-2,000, as follows:

Area	Band, kc.	Day	Night
Minn., Iowa, Mo., Ark.,	1800-1825	500	200
La. and east, including	1875-1900		
Puerto Rico and Virgin			
Ids.			
N. and S. Dak., Neb.,	1900-1925	500*	200*
Colo., N. Mex., and west,	1975-2000		
including Hawaiian Ids.,			
Texas, Okla., Kansas	1800-1825	200	75
	1875-1900		

\* Except in State of Washington where daytime power limited to 200 watts and nighttime power to 50 watts.

**Novice** licensees may use the following frequencies, transmitters to be crystal-controlled and have a maximum power input of 75 watts.

3.700-3.750	A1	21.100	21.250	A1
7.175-7.200	A1	145-147		A1, A2, A3

**Technician** licensees are permitted all amateur privileges in the bands 220 Mc. and above.

# A Compact Dual Beam for 20 and 40 Meters

## *Two-Band Operation with Simplicity*

BY L. J. JENSEN,\* WØMIQ

• WØMIQ has built a simple compact dual rotatable beam for 20 and 40 meters. After preliminary adjustments, hands can be changed instantly at the flip of a switch. The system is fed with a single coax transmission line with low s.w.r. on both bands. The boom is only 15 feet long, and the elements 24 feet, so it will fit in almost any backyard.

THE recent revival of loaded antennas has not only made it possible for the ham with a small backyard to put up a rotatable array for 20 meters, but it has also made a 40-meter parasitic beam mechanically feasible for the average ham. A logical development of this principle is the use of a single set of elements for two-band operation, simply shorting out loading coils, or portions of them, for the higher-frequency band. Element spacing is not a problem because a spacing of approximately 0.1 wavelength at 40 meters, where maximum gain occurs with the parasitic element tuned as a director, becomes 0.2 wavelength spacing at 20 meters. This spacing is close to optimum if the parasitic element is adjusted as a reflector. The loading coils can be shorted out by means of relays.

The photographs and sketches show the construction of a two-element beam covering 20 and 40 meters. The boom is 15 feet long, and the elements are 24 feet long. The array is easily turned with a TR-4 TV rotator.

Loading short elements, especially when the

elements are close-spaced, results in a high- $Q$  circuit in which the reactance will vary rapidly with a change in frequency. Thus any matching adjustment will hold over only a relatively small portion of the band. This can be alleviated to a considerable degree by using a pair of conductors for each element, and fanning them, as shown in the photographs. This, in effect, increases the size of the conductor. The curves of Fig. 1, made with a Millen s.w.r. bridge, show that with a match at the center of the 7-Mc. band, the s.w.r. does not exceed 1.75 to 1 at the ends of the band. At 14 Mc., there is the added benefit of wide spacing. These curves were made with a single matching adjustment for both bands.

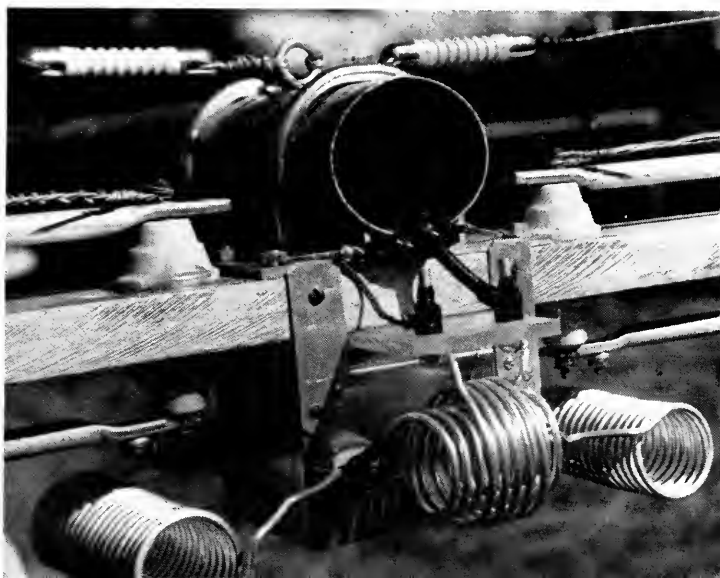
The transmission line (52-ohm coax) is inductively coupled to the center loading coil. On 20 meters, the radiator element is shortened only sufficiently to permit the use of enough loading-coil inductance to provide adequate coupling to the link. Loading inductance is added to make the electrical length of the elements suitable for 7-Mc. operation. A pair of relays shorts out the 40-meter loading coils in each element when operating on 20 meters.

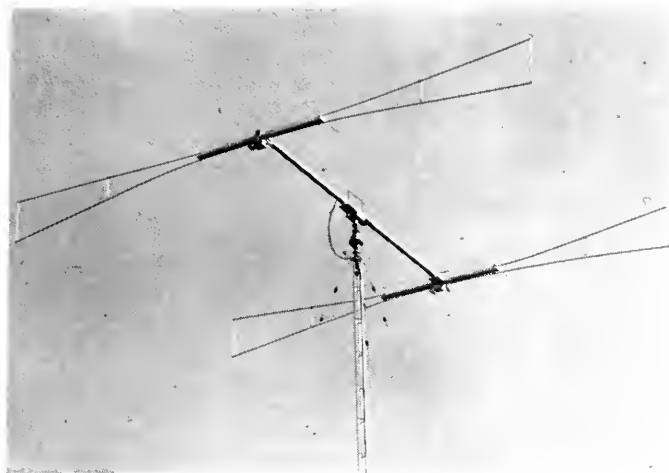
### *Construction*

The boom is a 15-foot section of 3-inch diameter ST-61 aluminum tubing with  $\frac{1}{16}$ -inch wall. A guy wire, connecting the ends of the boom, runs over a truss at the center of the boom to add rigidity. The boom is fastened at its center to a mounting, shown in one of the photographs, by means of two large U bolts. This mounting permits the boom to be tilted in either direction for adjustment of the loading coils merely by re-

\*20 West 9th St., Kansas City 5, Mo.

◆  
This view shows the assembly at the driven-element end of the boom. Except for the link winding and coax cable connection to it, the assembly at the parasitic end of the boom is identical. Shielded relay control wires also are run through the boom, emerging through a hole in the boom, and entering the relay box at the rear. Vertical guys are attached to the insulators at the ring-bolt in the end of the boom, and horizontal guys to the inner ends of the upper-element conductor. The metal base and angles between the boom and redwood support help to stiffen the mechanical joint. The outer braid of the coax cable is connected to the boom. Weather-proof tape is used to seal the coax cable and reduce corrosion at electrical joints.  
◆





The elements of this dual 20-40-meter beam are only 24 feet over all, and the boom is 16 feet long. The elements are fanned for broadbanding.

moving one of the hinge bolts or the other.

Similar U bolts at each end of the boom support a mounting for the antenna elements. These mountings are of redwood, 1 $\frac{1}{8}$  inches thick, 3 $\frac{3}{4}$  inches wide and 7 feet long.

Each half element is made up of two 12-foot lengths of ST-61 aluminum tubing, 1 $\frac{1}{2}$  inch in diameter with  $\frac{1}{16}$ -inch walls. At each of the inner ends, the tubing is flattened and drilled for the threaded rod of a feed-through insulator. At the outer ends of the supports, the elements are attached to similar feed-through insulators by means of clamps fashioned from sheet metal. The threaded rod of the outer feed-through insulator is made to extend about 6 inches above the top of the insulator. This extension serves as a vertical truss in bracing the elements. Also attached to this insulator with a sheet-metal strap is a 30-inch length of  $\frac{1}{2}$ -inch aluminum tubing that will serve as a horizontal truss. The ends are guyed to the vertical truss at the feed-through insulator.

The two conductors of each element are fanned out at the ends so that their tips are separated 30 inches. The spreaders are made of the same material as the elements, and are flattened at the

ends and drilled for screws that fasten them to the elements. The tips of the elements are similarly flattened and drilled, but the elements are not flattened for the short intermediate spreaders, since this would weaken the elements. The short spreaders are placed as shown in the photograph.

A system of guy wires is used to brace the elements both vertically to prevent drooping, and horizontally to reduce whip. Copper-clad stranded steel guy wire used in TV work is good material for these guys. The guy wires are insulated from the boom, but not from the elements. On each side of the boom, a guy wire runs from a strain insulator fastened to the boom, over the truss at the outer feed-through insulator, and thence to the upper bolt at the short spreader.

The horizontal guys run from the stand-off insulators at the inner ends of the elements to the horizontal truss, and thence to a bridle at the short spreader. This bridle is simply a piece of guy wire loosely spanning the spreader.

The relays that short out the 40-meter loading coils are enclosed in standard 3  $\times$  4  $\times$  5-inch aluminum boxes. The relays should be of the antenna-changeover type with good insulation and heavy-current contacts, such as the Ad-

Each element is guyed both vertically and horizontally. The vertical truss is a brass rod extending above the outer feed-through insulator. The horizontal truss is a piece of aluminum tubing attached to the same insulator with a clamp. Similar clamps anchor the element conductors to the insulator.



vance AT/2C. I was able to pick up some surplus 28-volt models at \$1.29 each,<sup>1</sup> operating them from a 100-ma. selenium-rectifier supply.

Leads to the loading coils are brought out through 1-inch ceramic feed-through insulators set in the sides of the boxes. These feed-through insulators also serve as mountings for all coils except the link coil. The latter is fastened to a piece of  $\frac{1}{4}$ -inch polystyrene sheet attached to the redwood support for the elements. The mounting screws also serve as terminals for connecting the coax line to the link. The coax line is fed through the boom to a point near the center where it leaves through a hole to an anchorage on the mast.

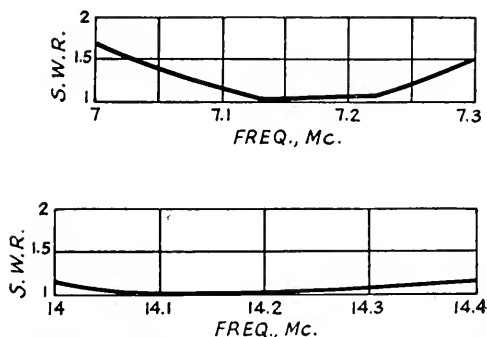


Fig. 1 — Curves showing s.w.r. measured on transmission line feeding the dual beam.

The loading coils shown are wound with heavy-duty aluminum clothesline, although  $\frac{1}{8}$ -inch to  $\frac{3}{16}$ -inch copper tubing, or No. 8 copper wire could be used. The 20-meter loading coil in the driven element has 8 turns  $1\frac{1}{2}$  inches in diameter, turns spaced approximately the diameter of the conductor. The link coil has 5 turns, similarly spaced, 2 inches in diameter. The 40-meter loading coils in the driven element each have 20 turns  $1\frac{1}{2}$  inches in diameter. In the parasitic element, the 20-meter coil has 11 turns, and the 40 meter coils 18 turns each, all  $1\frac{1}{2}$  inches in diameter.

After completion, the entire beam was sprayed with two coats of acrylic or plastic lacquer. All exposed electrical connections were first covered with plastic tape and then sprayed.

### Adjustment

The parasitic element should be adjusted as a reflector for 20-meter operation first, with the 40-meter loading coils shorted out and the driven element open at the center. In my case, it was made 5 per cent electrically longer than a half wave for 14.2 Mc. With a grip-dip meter coupled to the 20-meter loading coil, the resonant frequency should be adjusted to 13.5 Mc. by squeezing or spreading the turns as necessary. If this does not suffice, it may be necessary to add or subtract a turn. Then, with the shorts removed from the 40-meter loading coils, the coils should be adjusted for element resonance at 7.5

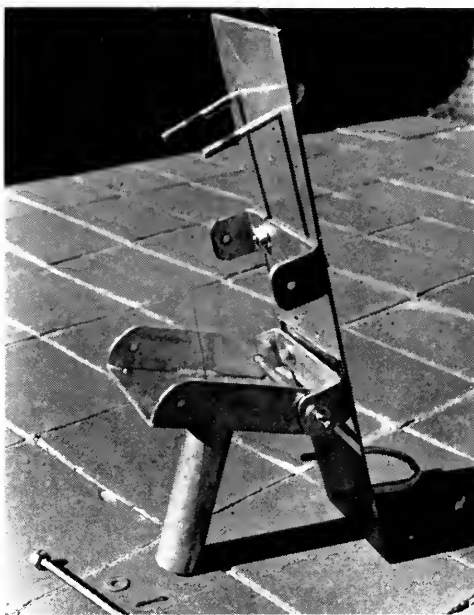
Mc. This gives an electrical length about 4 per cent shorter than a half wavelength — a proper length for operation as a director.

Attention should now be turned to the driven element. With the 40-meter loading coils shorted out, the output terminals of a 52-ohm s.w.r. bridge should be connected to the link terminals, and a suitable r.f. source fed to the bridge. Following recommended procedure,<sup>2</sup> the 20-meter loading coil should be adjusted for minimum s.w.r. Then, with the shorts removed from the 40-meter loading coils, these coils should be adjusted similarly.

The 52-ohm coax line may then be connected and a recheck of the match made by connecting the bridge to the transmitter end of the line. Adjustment should be made as close to the final elevation as possible. If the adjustment as checked with the s.w.r. bridge at the input of the line does not hold after the array has been put in place, the s.w.r. measurements will show the frequency of minimum s.w.r., and thus the direction in which the driven element should be retuned.

If greater f.-b. ratio is desired, the procedure will be the same, but it should start out with a greater electrical length (lower resonant frequency) for the reflector, and a shorter electrical length (higher resonant frequency) for the director.

In conclusion, I want to thank W0PUB whose ever-ready strong arm enabled countless experiments to be completed with success.



The tilting mount for the boom. The stub is an 8-inch piece of  $1\frac{1}{2}$ -inch pipe welded to a channel of  $\frac{1}{8}$ -inch steel. This channel is 8 inches long, 6 inches wide, and the sides are 2 inches high. The mounting plate (with U bolts in place) is of  $\frac{3}{8}$ -inch hardened aluminum, 6 inches wide and 24 inches long. The U-shaped strips attached to the mounting plate are of steel strip  $\frac{3}{8}$ -inch thick and 2 inches wide, case-hardened after processing and fitting. The pins are  $\frac{3}{8}$ -inch steel with nuts welded at one end and cotter-pin holes at the other. The boom may be tilted in either direction.

<sup>1</sup> Potter Radio Co., 1314 McGee St., Kansas City, Mo.

<sup>2</sup> Measurements Chapter, *ARRL Handbook*, 30th edition, et seq.

# Frequency Marker with 50-Kc. Intervals

*A Compact, Low-Cost Unit Using Surplus Crystals*

BY BEVERLY DUDLEY \*

• Here is a frequency standard built around the low-frequency FT-211A crystals, and using a multivibrator to obtain markers every 50 kc. throughout the communication spectrum. The oscillator circuit is one that will work with high-frequency crystals as well, and thus provide spot checks for identifying the 50-kc. harmonics.

A FREQUENCY MARKER providing spot frequencies at intervals of 50 kc. per second is a useful piece of measuring equipment for the radio amateur, not alone because it permits accurate determination of the amateur band limits, but because it provides means for calibrating receivers, variable-frequency oscillators and similar gear. The frequency marker described in this article provides crystal-controlled marker frequencies at 50-kc. intervals up to at least 30 Mc.

Power to operate the unit is taken from the 60-cycle line. The frequency marker contains its own power supply, consisting of a 6.3-volt 1-ampere filament transformer, and a half-wave selenium rectifier and resistance-capacitance smoothing filter comprised of  $C_1$ ,  $C_2$ , and  $R_1$ . Protection against short circuits to ground is provided by the ground coupling capacitor,  $C_{12}$ , in the output circuit.

The crystal oscillator uses a 6AK5 pentode in an electron-coupled Pierce oscillator circuit, with the screen of the pentode serving as the plate of an equivalent triode while output to the multivibrator is taken from the plate of the pentode. The frequency of oscillation can be adjusted over a small range by means of the variable capacitors  $C_3$  and  $C_4$ . Capacitor  $C_4$  is used to raise the frequency, whereas  $C_3$  lowers the frequency slightly. Both of these capacitors are mounted on a single ceramic base as a double trimmer, and each has a capacitance range of from 10 to 170  $\mu\text{f}$ . A series capacitor,  $C_5$ , was used to reduce the

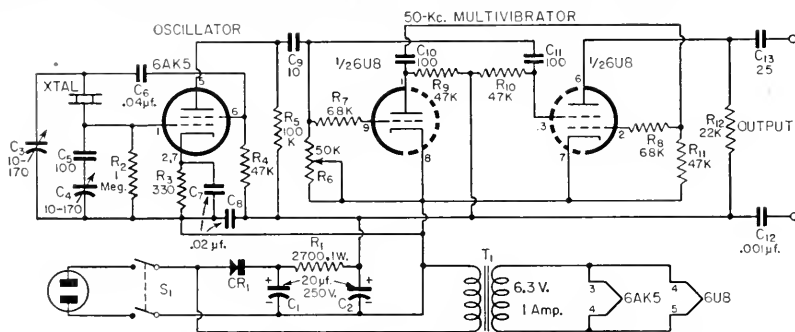


Fig. 1 — Circuit of the 50-kc. frequency marker. Resistors are  $\frac{1}{2}$ -watt composition unless otherwise specified. Capacitances in  $\mu\text{f}$ , except where specified otherwise.

$C_1$ ,  $C_2$  — Electrolytic.

$C_3$ ,  $C_4$  — Dual ceramic-mounted trimmer.

$C_5$ ,  $C_9$ ,  $C_{10}$ ,  $C_{11}$ ,  $C_{13}$  — Mica.

$C_6$ ,  $C_7$ ,  $C_8$ ,  $C_{12}$  — Ceramic or paper.

CR1 — 75-ma. selenium rectifier.

S1 — D.p.s.t. slide.

Except for the 115-volt a.c. source of power, it is entirely self-contained in a standard metal case, 3 by 4 by 5 inches in size. It uses a low-frequency crystal, such as are now readily available on the surplus market in FT-211 or FT-243 holders for two dollars or less.

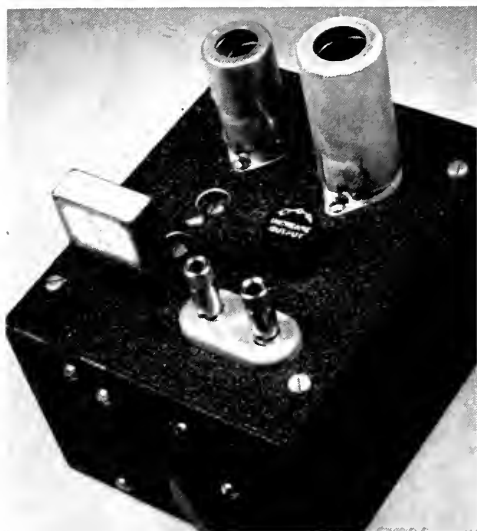
## Circuit

As the wiring diagram, Fig. 1, shows, the marker comprises a 6AK5 crystal-controlled oscillator, followed by a 6U8 triode-pentode frequency-controlled multivibrator adjusted to provide marker frequencies at intervals of 50 kc. Output is ample for communication-type receivers up to 30 Mc.

maximum capacitance of  $C_4$  to about 60  $\mu\text{f}$ . Output from the plate of the 6AK5 is fed to the grid of the triode section of the 6U8 multivibrator.

The frequency divider consists of an electron-coupled multivibrator. When free running (i.e., not controlled by the crystal oscillator) its frequency range extends from about 30 to 80 kc., depending upon the setting of the frequency-adjusting resistor,  $R_6$ . When the multivibrator is frequency controlled to operate at 50 kc.,  $R_6$  has a value of about 23,000 ohms. Aside from the feature of electron coupling, which virtually eliminates effect of load on operation of the frequency marker, the only unusual feature of the multivibrator circuit is the use of series resistors in the grid circuits. These are not necessary but

\* 22 Temple Street, Belmont 78, Mass.



This unit generates frequency marker signals at 50-ke. intervals, using surplus crystals in the 400- to 500-ke. region as the primary frequency source. In this front view the oscillator tube is at the left rear and the multivibrator tube at the right.

are used as an aid in producing a reasonably good square-wave output at 50 ke.

### Adjustment

The oscillator goes into oscillation easily when the crystal is plugged into its holder. The multivibrator is, perhaps, easiest adjusted by coupling its output to a communications-type receiver and varying the resistance of  $R_6$  until marker frequencies are produced at intervals of 50 ke. This adjustment is most easily done in the broadcast band, or a similar low-frequency band of a multiband receiver. Proper adjustment is that for which the note in the receiver is sharp and clean. It will probably be found that the desired condition of operation can be obtained with  $R_6$  adjustable throughout a small range of angular rotation. If adjustment is made by means of a receiver alone, the mid-point of this angular rotation is probably the best adjustment, but a check at the high-frequency end of the receiver is advisable.

If a cathode-ray oscilloscope is available, it can be used to permit the output to be adjusted more nearly to a square wave. This is done by connecting the

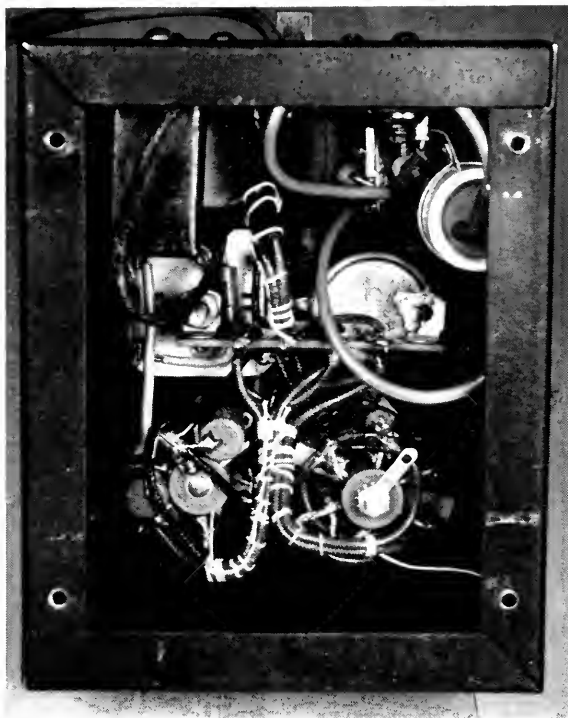
output of the multivibrator to the input terminals of the vertical-input amplifier of the oscilloscope. The oscilloscope sweep circuit should be adjusted to provide horizontal sweep of from 10 to 50 ke., and the synchronizing adjustment should be advanced to lock the trace into a stationary pattern showing several cycles of waveform of the multivibrator. The resistor  $R_6$  may then be adjusted to that value of resistance which yields the most nearly square wave on the screen of the oscilloscope.

### Operating Data

Power consumption is small (approximately 10 watts) and thus the unit may be left running continuously. Very little drift — only a few cycles per second — is observed in warming up, however, so for most frequency measurements it is not really necessary to leave the unit running. The crystal frequency can be adjusted to exact value by varying  $C_3$  or  $C_4$  until the output is in zero beat with signals received from WWV.

A score of crystals have been used with this frequency marker and in all cases oscillation occurred readily. The multivibrator has synchronized easily with crystals whose fundamental frequencies were 200, 400, and 500 ke. The oscillator also worked well with crystals having frequencies of 1000 and 5000 ke., but the multivibrator would not synchronize at all with the 5-Mc. crystal, and only with difficulty and not too satisfactorily with the 1-Mc. crystal. This is in accordance with usual good practice of not using multivibrators for dividing the frequency of the

(Continued on page 120)



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Power-supply components are at the top in this interior view of the frequency marker. Most of the oscillator and multivibrator circuit components are mounted on the Vector sockets for the two tubes.

# Overtone Crystals—How and Where To Use Them

*Some Circuits and Their Adaptation to V. H. F. Gear*

BY EDWARD P. TILTON, WIHDQ

**T**HOUGH we've used overtone crystal oscillator circuits in v.h.f. work for quite a few years, it's a safe bet that the vast majority of all hams who employ overtone techniques have little understanding of what actually goes on in such oscillators. Several types of overtone crystal circuits were discussed in detail in *QST* some years back,<sup>1</sup> and this information appears in boiled-down form in all recent editions of the *Handbook*. It is suggested that the reader go over these references, as what is to follow is supplementary to them.

All overtone oscillator circuits have one basic feature in common: some method of introducing additional feed-back, beyond that normally present in simple oscillator circuits. The difference between the various overtone circuits lies mainly in the method of controlling the feed-back. The idea is to give the crystal a little extra regenerative kick, on the frequency of the desired overtone, to encourage oscillation at that frequency rather than on the fundamental. There should be only just enough to accomplish this, without causing the stage to take off on a frequency determined by the tuned circuits, rather than by the crystal.

## How Crystals Work on Overtones

The frequency at which a quartz plate will

<sup>1</sup> Tilton, "Overtone Crystal Oscillator Circuits," *QST*, April, 1951, page 56.

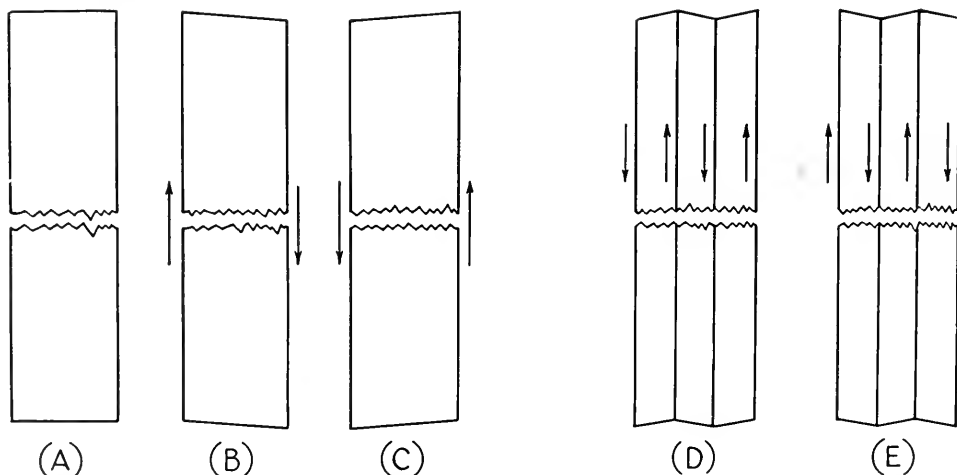


Fig. 1 — How crystals oscillate at fundamental and overtone frequencies. The crystal, A, is shown at successive peaks of the cycle, when oscillating on its fundamental frequency, B and C. When oscillation is on overtones the crystal is broken down into layers, as shown at D and E.

• The economy and circuit simplicity that are achieved through the use of overtone crystal oscillators have a price: the need for some care on the part of the user, to be sure that they are adjusted and operated properly. Overtone crystals and circuits should be thought of as tools useful in attaining certain ends, rather than as an all-inclusive technique to replace other methods in v.h.f. circuit design. Here the good and bad features of overtone circuitry are sorted out, to enable the v.h.f. man to decide whether they are right for the job at hand.

oscillate is determined by the way it is cut from the main crystal, and in the case of frequencies we're interested in here, by its thickness. The crystal, Fig. 1A, is deformed mechanically during oscillation, as shown in greatly exaggerated form in Figs. 1B and 1C. When the crystal oscillates on an overtone (the fundamental frequency divided by some *odd* number) it breaks down into separate layers. There are three layers for a 3rd-overtone oscillation, five for 5th, and so on. The overtone crystal looks like Fig. 1D and 1E, again greatly exaggerated. There is no fundamental-frequency oscillation at this time, nor is it possible to develop oscillation on even multiples.



When we remember that a crystal is actually a very thin plate, we can see why some work perfectly on their design frequencies, but refuse to oscillate on overtones. And it is obvious why extreme care must be taken in grinding and mounting crystals where overtones higher than the third are to be used. A 7-Mc. BT-cut crystal is only about 0.014 inch thick. This means that the overtone layers, even for 3rd-mode operation, are less than 0.005 inch in thickness. For 5th mode they are less than 0.003 and for 7th, 0.002 inch thick! This doesn't allow much for variations in thickness due to imperfect grinding. Even a tiny scratch on the surface may destroy overtone-mode operation entirely. The slight convex curvature usually imparted to the surfaces of standard crystals also may prevent high-order overtone oscillation.

The method of mounting, too, may have considerable bearing on how well the crystal will work in overtone service. Pressure mounting, as in the FT-243 type of holder so commonly used, clamps the crystal in place and tends to inhibit overtone oscillation. In general, crystals mounted in the small CR-7 type of holder, with electrodes in the form of plated areas on the crystal surfaces, tend to work better on overtones than do pressure-mounted types. The capacitance of the holder may be an important factor in the attainment of high-order overtones, and here, again, the CR-7 holder and mounting method are superior.

Just about any crystal that will work well on its intended frequency will oscillate reasonably well on its 3rd overtone. Higher overtones are generally unsatisfactory with crystals ground for fundamental use. The 5th may be found, but with a majority of run-of-the-market crystals it will be low in output and very critical in adjustment. This applies to crystals between 5 and 12 Mc. Lower than 5 Mc., the crystals are thick enough so that 5th and sometimes higher overtones can be developed. Fifth-mode operation of 3.5-Mc. crystals, for instance, may be quite satisfactory. We keep hearing about this or that pet circuit that makes possible the development of high-order overtones with any crystal, but many hours of tedious adjustments with any number of circuit variations and with hundreds of crystals have convinced the writer that trying for overtones beyond the 3rd with crystals higher than about 5 Mc. is a waste of time and patience, unless crystals ground especially for overtone service are used.

### Overtone Circuitry

With crystals ground and mounted for overtone use, even simple circuits will work satisfactorily, provided that there is a tuned circuit at the overtone frequency, as in Fig. 2A. This is suitable for use between 12 and 54 Mc., the range over which relatively inexpensive 3rd-mode crystals are currently available. There is some overlap between 12 and 20 Mc. as to whether a crystal is an overtone type or not. Most manufacturers supply overtone crystals for any frequency above

12 Mc., though fundamental crystals can be made up to about 20 Mc.

The simplest circuit, Fig. 2A, ordinarily does not provide enough feed-back to make fundamental crystals in the 6- to 9-Mc. range take off on the 3rd overtone, however, so some provision

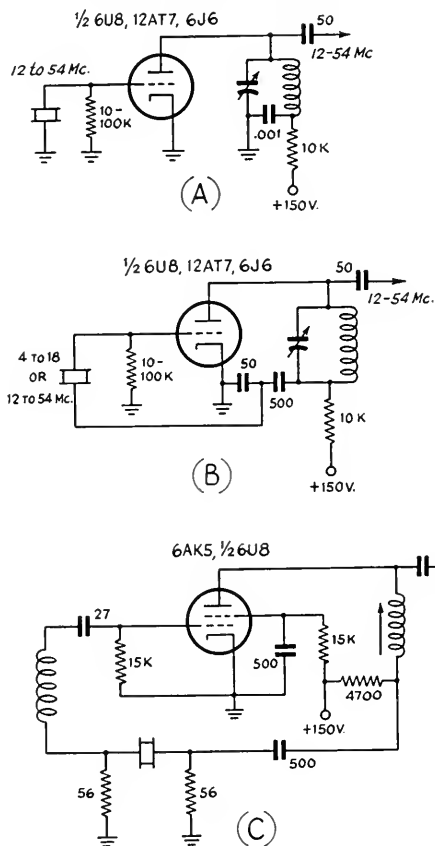


Fig. 2 — Three circuits for use with overtone crystals. Circuit A, the simplest possible overtone circuit, is suitable for use with crystals processed for overtone service. Circuit B introduces more feed-back, and may be used with fundamental-type crystals. The circuit at C is for obtaining high-order overtones with crystals that were processed for 3rd-overtone use. It was sent in by W9MBI, who reports use of it for direct control at frequencies as high as 216 Mc. In all three diagrams, the tuned circuits are resonated at the frequency of the desired overtone. The grid circuit in C may be tuned with a capacitor for greater range.

must be made to increase and control regeneration. In addition to the circuits we've been using for several years<sup>1</sup> there are variations such as the one shown in Fig. 2B. This circuit was first used in *QST* through the courtesy of the Robert Dollar Co. and W6EFT. The feed-back element here is the smaller of the two capacitors connected between the low side of the plate coil and ground. Decreasing the capacitance increases the feed-back, though the value of 50  $\mu\text{f.}$  has been satisfactory in several applications in which we've tried many types of crystals. This takes only one

(Continued on page 120)

# Flexibility in the Antenna Coupler

## A Wide-Range Antenna Tuner and Coax-Matching Circuit

BY T. H. PUCKETT,\* W5JXM

• Antenna couplers don't seem to have changed much over the years, but matching the coupler to a coax line is becoming increasingly important to amateurs. Here is a unit which performs both functions in one package.

THE advent of low-pass filters and pi-tank output circuits has just about made some form of transmission-line impedance matching a must in amateur stations. Also, if a balanced antenna and transmission line is used, most amateurs these days prefer to put in some

Fig. 1—Complete schematic of the coupler.  $T_1$  should be as required for series- or parallel-tuning of the particular antenna-feeder system used (Barker & Williamson type TA antenna coil used in the unit pictured).

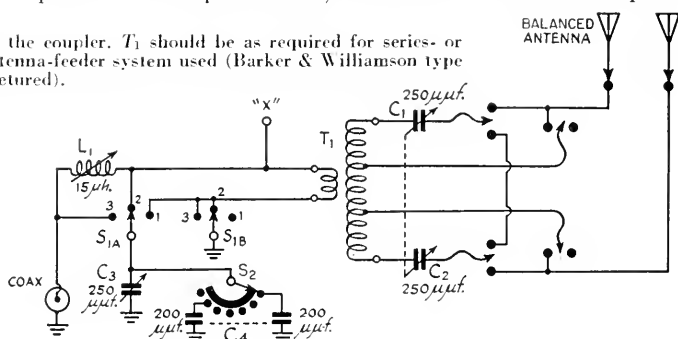
$C_1$ ,  $C_2$ —250- $\mu\text{f}$ . variable, 3000-volt rating (see text).

$C_3$ —250- $\mu\text{f}$ . variable, 1000-volt rating.

$C_4$ —Nine 200- $\mu\text{f}$ . 1250-volt working, mica condensers.

$S_1$ —2 poles, 3 positions, steatite.

$S_2$ —10-position progressive shunting (Centralab P1S section, steatite).



device to convert to unbalanced coaxial line because of its greater convenience in installation. This antenna coupler is designed to perform both of these functions in one package, and to have enough range to accommodate any of the usual amateur antenna-feedline combinations. This is achieved by using plug-in coils for bal-

anced to single-ended conversion, and an adjustable  $L$ - $C$  section for matching to the coax transmission line.

The complete circuit is given in Fig. 1. Barker and Williamson type TA plug-in coils are used for  $T_1$ , the balanced-to-single-ended converter. These are designed for this purpose, being made of tinned wire so that taps may be easily made. Two clips are furnished with each coil for making taps.

The antenna side of the circuit is a more or less conventional plug-and-jack arrangement which may be connected for either series or parallel feed. Fig. 2A shows the plug arrangement for parallel feed, and B for series feed. The taps on

the coil are not needed for series feed, but are indicated because the same coil might be used for both series and parallel feed at different times. Dummy jacks are provided for storing the taps.

The antenna tuning capacitors  $C_1$  and  $C_2$  have a maximum capacitance of 250  $\mu\text{f}$ . each, which is considerably more than is necessary to resonate the 80-meter coil. However, it is sometimes convenient to have the extra capacitance available, as some antennas couple considerable reactance into the tuner which must be canceled out to achieve resonance. As it was expected to use this coupler only on the 80-, 40- and 20-meter bands, no great thought was given to the rather large minimum capacitance of these capacitors. If regular 15- or 10-meter operation is planned it is suggested that 150- or even 100- $\mu\text{f}$ . capacitors be substituted. Also, it would probably be wise to make the circuit a little more symmetrical. As may be seen in the back view, one capacitor is much nearer the variable inductor than the other, and has an aluminum support bracket fastened to it.

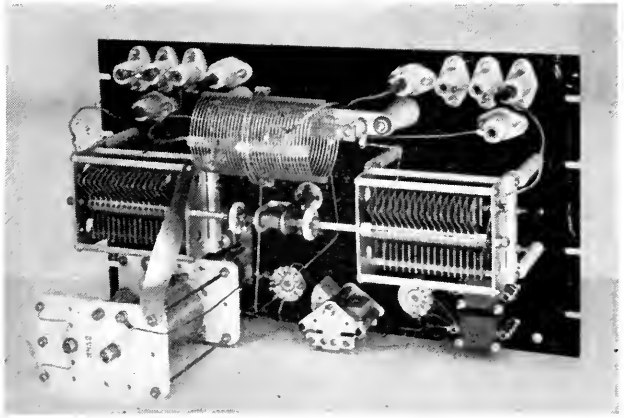
The coax line side of the unit may be set to three different configurations by the circuit switch  $S_1$ . These are shown in Fig. 3. A shows the switch in position 1, where the fixed link is

\* Box 2155, Boulevard Station, Norman, Okla.



Front view of the coupler. The large center dial controls the antenna tuning capacitors through a right-angle drive. The two knobs at the lower left control the matching-section capacitance, the switch controls the matching-section circuit, and the counter dial drives the matching-section variable inductor. All controls have arbitrary letter designations.

Rear view of the coupler. The antenna feed line comes in from the top. The  $L$ - $C$  matching section components are along the bottom. The 80-meter coil is plugged in. A standard 10½-inch aluminum rack panel is used as a mounting base. The output coax connector is behind the variable inductor.



series tuned. B shows the switch in position 2, with an  $L$ - $C$  matching circuit that is useful when the impedance looking into the link is high. C, position 3, is useful when the impedance looking into the link is low.

Switch  $S_2$  is a progressively shorting ten-position switch which can connect nine 200- $\mu\text{f}$ . fixed mica capacitors,  $C_4$ , in parallel with the 250- $\mu\text{f}$ . variable capacitor,  $C_3$ . This gives a total capacitance range of about 2000  $\mu\text{f}$ . The variable inductor  $L_1$  is a 15-microhenry job, Barker and Williamson No. 3852, which is driven from the front panel by a B & W No. 3902 100-turn counter dial.

#### Operation

A standing-wave ratio bridge of some kind is an excellent indicator for adjusting the coupler.

The controls are simply manipulated to produce a null on the s.w.r. bridge. If one of the "Micro-match" type is used, it may be left in the line continuously. A calibration chart should be prepared which lists the control settings *vs.* frequency.

The suggested operation of the coupler when it is being calibrated is as follows: Set  $S_1$  on position 2, and  $C_3$ ,  $C_4$ , and  $L_1$  on minimum capacitance and inductance, respectively. Plug in the proper coil and adjust the antenna tuning capacitors,  $C_1$  and  $C_2$ , and the coil taps, if used, to give resonance. This would be indicated by a dip on a standing-wave indicator. Then adjust  $C_3$ ,  $C_4$  and  $L_1$  until the line is matched. Try the other two positions of  $S_1$  if necessary. Position 2 of  $S_1$  is preferred, as it should give the best

(Continued on page 126)

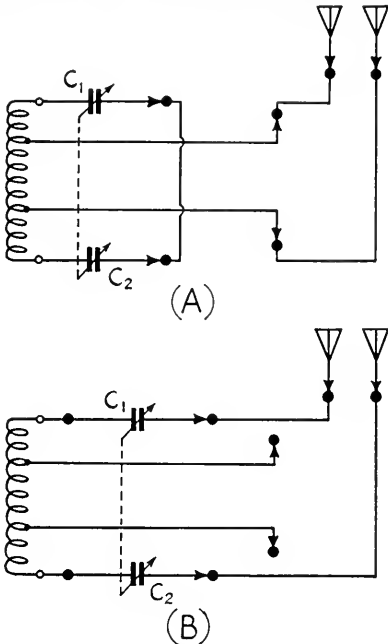


Fig. 2 — (A) shows the plug connections for a parallel-tuned antenna-feed line combination. (B) shows the connections for series tuning.

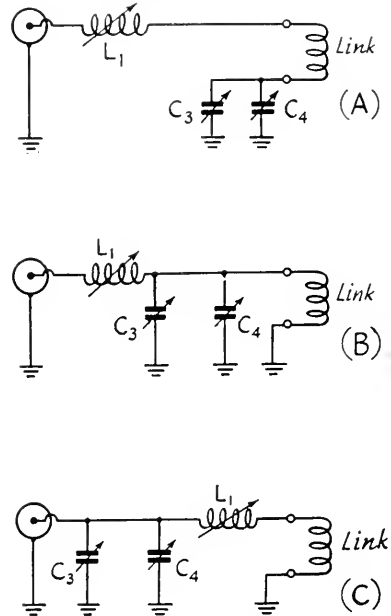


Fig. 3 — The three possible matching section circuit arrangements. (A) shows  $S_1$  in position 1, (B) in position 2, and (C) in position 3.

# Low-Noise Receiver Design

### Reworking a Receiver for Maximum Sensitivity

BY HARRY LONGERICH,\* W2GOY/4, AND ROBERT D. SMITH,\*\* W5LHD

• This is an interesting article telling how two amateurs were able to improve considerably the performance of a commercial receiver. We think you will be interested in the reasoning and the circuitry involved. However, it should be pointed out that the improvement that can be expected with any receiver will be in proportion to the poorness of its present performance and the lack of outside noise at one's location—you can't expect these changes to help a currently-good receiver or one in a noisy location.

**A**FTER spending several hundred dollars for a new receiver, most of us feel rather pleased with ourselves — if we didn't, that hollow sensation in the hip pocket would be hard to bear. But how about a few months later, when the novelty has worn off and we've settled down to some serious DX operating? Are there ever any little gnawing doubts? Probably more often than most of us would care to admit. The crux of the situation is that while one receiver may have better selectivity, stability, or operating con-

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\*\* Lieut., 6207th AC&W, APO 74, % Postmaster, San Francisco, Calif.

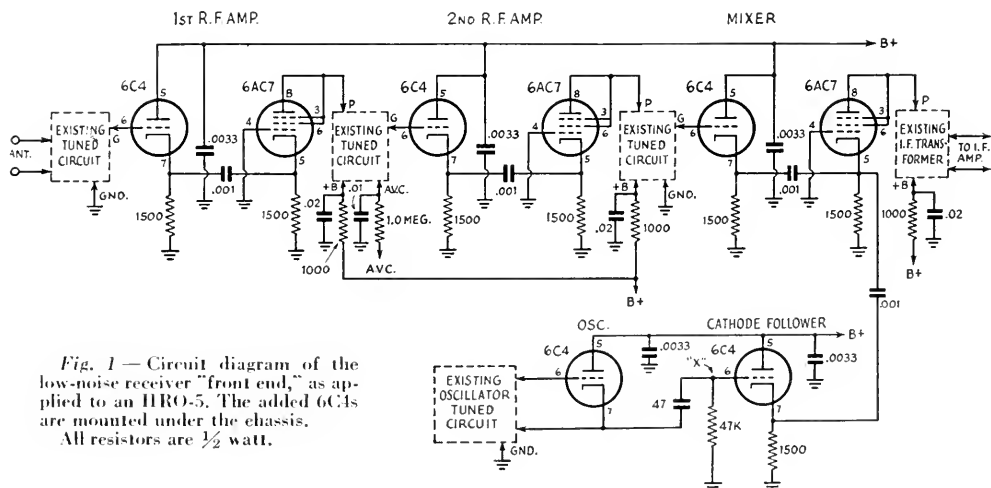
<sup>1</sup> Two r.f. stages are not necessarily better than one. If a low-noise mixer is used, one good r.f. stage should be sufficient, and it would lessen the chances of cross-modulation in the front end. — Ed.

venience than another, they are pretty much alike so far as front-end performance is concerned. This is because the industry long ago settled on pentode r.f. amplifiers and pentagrid mixers as the accepted standard. Obviously, two r.f. stages are better than one or none, but manufacturer X's r.f. amplifiers or mixers will have essentially the same noise figure as those of manufacturer Y.<sup>1</sup>

As it turns out, low-noise amplifiers have been easiest to build for the v.h.f. bands because of the small frequency coverage (percentagewise) demanded of most v.h.f. receivers. External noise is lowest in the v.h.f. bands, and hence full advantage can be taken of low-noise r.f. amplifiers. Generally accepted theory considers that external noise (static, etc.) is so strong below 25 Mc. that it is useless to use special circuits to reduce internal receiver noise on our general operating frequencies. While this is essentially true, we believe the critical frequency to be more in the order of 10 Mc., indicating low-noise circuits for three of our most important DX bands. This figure of 10 Mc. is somewhat variable, depending on local conditions; certainly the man who lives under a trolley line is little concerned with internal set noise at virtually any frequency.

### Testing Your Receiver

Here is a simple test to determine whether or not a lower noise figure would help your own receiver: set it to or near your favorite DX band (use your regular receiving antenna), tune in a frequency entirely free of any signal, advance the



*Fig. 1*—Circuit diagram of the low-noise receiver "front end," as applied to an HRO-5. The added 6C4s are mounted under the chassis.

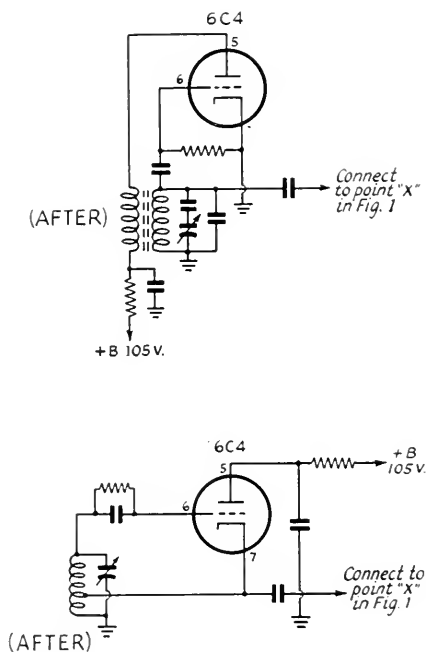
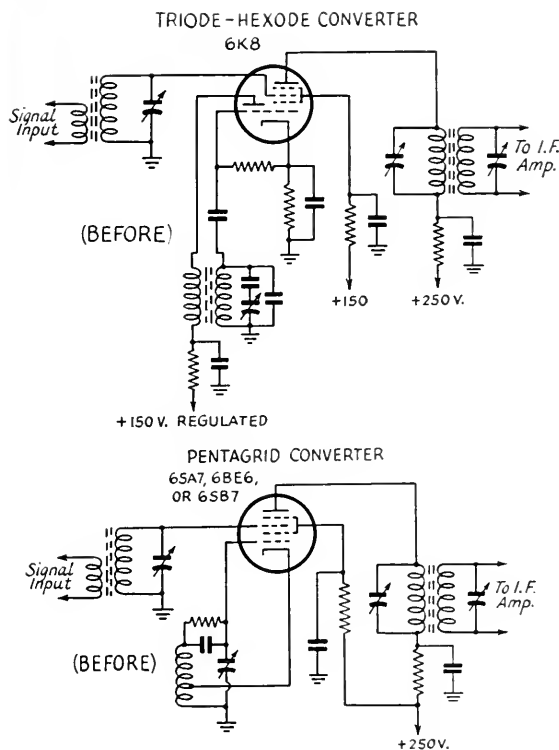


Fig. 2 — Typical oscillator circuits, before and after modification.

gain until the noise is at a comfortable level, and now substitute a resistor having the same value as the antenna input impedance, usually about 300 ohms. If there was not an appreciable decrease in noise when the antenna was replaced by the resistor, your receiver can stand improvement; most of the noise remaining is being generated within the receiver.

We made the above test on a modified HRO-5, and found that internal set noise masked much of the weak-signal DX. In the course of testing this and other receivers, another interesting fact came to light. Literature covering weak-signal reception, available to us, generally states that the first r.f. stage is the most important since its noise is amplified more than that of any other stage. This apparently does not hold true for the average amateur receiver; a considerable amount of noise is contributed by the pentagrid mixer or converter stage. Further research into the subject disclosed that pentagrid mixer and converter tubes available today have an equivalent noise resistance ranging from 62,000 to 300,000 ohms;<sup>2</sup> in addition, conversion transconductance is low. Economic factors and construction convenience have generally dictated the use of conventional mixers or converters, because they are simple and inexpensive and perform fairly satisfactorily for most medium frequency applications. However, at frequencies above 10

Mc., they may leave quite a bit to be desired.

### R. F. Amplifiers

The triode is the least noisy vacuum tube amplifier known. A check of tubes narrowed our choice to a triode-connected 6AC7, or the miniature version, the 6AH6, since they have the highest  $g_m$  and therefore the lowest equivalent noise resistance of available triodes.<sup>3</sup>

A straight triode amplifier is not practical because it will oscillate without neutralization, and neutralization is impractical in multiband receivers. The grounded-grid amplifier overcomes this objection, but in turn has the drawback of heavy input-circuit loading. To overcome this disadvantage, the cathode follower is made to order. The high input impedance of a 6C4 cathode follower stage decreases loading of the tuned circuit, resulting in greatly increased input-signal voltage, and improved r.f. selectivity; while the low output impedance of the cathode follower matches the input of the grounded-grid stage. Our experience has shown the combination to be relatively noise free.

### Mixer

Since the grounded-grid amplifier and cathode follower proved so successful, it was decided to try the combination in the mixer stage. Cathode injection looked like a good bet.<sup>4</sup> The circuit was incorporated in the modified HRO-5 and it

(Continued on page 128)

<sup>2</sup> Radiotron Designer's Handbook, 4th Edition, page 938.

<sup>3</sup> The more elements there are in a vacuum tube, the greater the noise that is produced, because of the random division of the cathode current between the elements. See Terman, *Radio Engineer's Handbook*, page 294.

<sup>4</sup> Goodman, "Some Notes on Improving Small Receiver Performance," *QST*, December, 1953.

# The Multimatch Antenna System

Unique Design Providing Essentially Constant Impedance Over Several Bands

BY CHESTER L. BUCHANAN,\* W3DZZ

• For a long time, hams have been searching for a single antenna that could be fed efficiently with a low-impedance transmission line on several bands. At last a simple but ingenious design by W3DZZ provides a solution. He has applied some well-known but neglected principles to both wire and parasitic-beam antennas.

RADIO transmitters and receivers have enjoyed rapid development in flexibility to the point where changing bands is a matter of only spinning a dial or two and flipping a couple of switches. In contrast, the operation of a single antenna on several bands is usually done only at the expense of high standing waves on the feed line, because of the wide variation in antenna feed-point impedance from band to band.

Some work done by the author several years ago in connection with a dual-band parasitic array<sup>1</sup> has led to the development of a simple wire antenna covering five bands, from 80 to 10 meters. This antenna can be fed with a low-impedance transmission line without incurring excessive s.w.r. on any of these bands.

## Basic Design

The fundamental principle of the system can be explained with the aid of Fig. 1. In Fig. 1A,

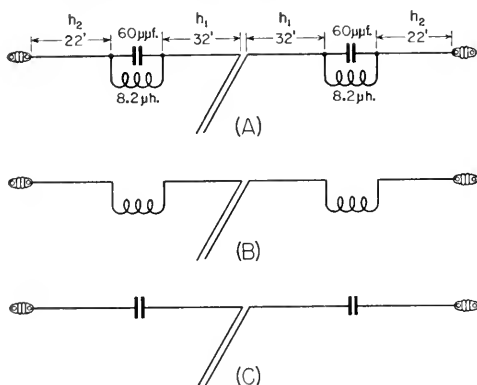


Fig. 1 — Sketch illustrating the three fundamental modes of the multimatch antenna.

\* 4671 Lacy Ave., Washington 23, D. C.

<sup>1</sup> Buchanan, "Duo-Band Ham Antenna," *Radio & Television News*, December, 1950.

<sup>2</sup> Morgan, "A Multifrequency Tuned Antenna System," *Electronics*, August, 1940.

sections  $h_1$  constitute a half-wave dipole for some frequency  $f_1$ . This dipole is terminated in lumped-constant trap circuits resonant at  $f_1$ . Additional wire sections,  $h_2$ , extend beyond the traps. If the system is excited at frequency  $f_1$ , the traps serve to isolate the dipole much as though insulators were inserted at these points.<sup>2</sup>

At frequencies much lower than  $f_1$ , the traps no longer isolate the dipole, but act simply

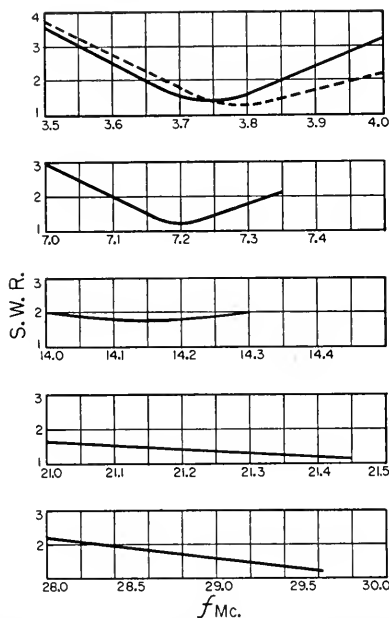


Fig. 2 — S.w.r. measurements made on the antenna of Fig. 1A. The dashed lines show measurements made on a 122-foot dipole in the same location for comparison.

as loading inductances in a second dipole whose electrical length is made up of  $h_1$ ,  $h_2$  and the inductive reactance of the traps, as in Fig. 1B.

At frequencies much higher than  $f_1$ , the traps again cease to isolate the sections, the traps now acting as series capacitances, as in Fig. 1C.

Another important consideration in this multi-band system is that low impedance at the center feed point of the antenna occurs not only at its fundamental resonance but also at any odd harmonic of the fundamental.

By applying these principles, and by proper selection of the values of  $L$  and  $C$  in the traps, and choice of lengths for  $h_1$  and  $h_2$ , it has been possible to arrive at a design where the system operates as follows:

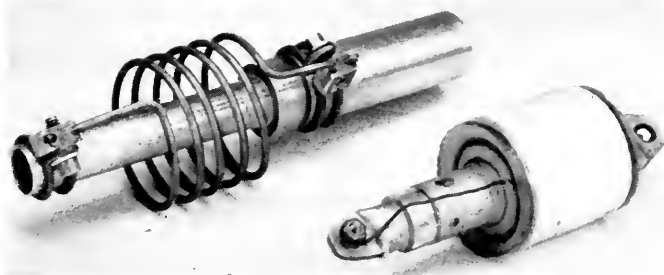
- 1) Sections  $h_1$  form a half-wave dipole resonant

in the 40-meter band. The traps, resonant at the same frequency, isolate this dipole from the outer sections.

2) The inductive reactance of the traps is such that the entire system, including sections  $h_2$ , resonates as a loaded half-wave dipole for the 80-meter band.

3) The capacitive reactance of the traps at higher frequencies is such that the entire system resonates as a  $3/2$  wavelength antenna on 20,  $5/2$  wavelength on 15, and  $7/2$  wavelength on 10 meters.

The antenna is fed with 75-ohm Twin-Lead, and Fig. 2 shows the results of s.w.r. measure-



Lightweight weatherproof traps made by the author. To the left is the type inserted in beam elements, while the other one is suitable for wire antennas.

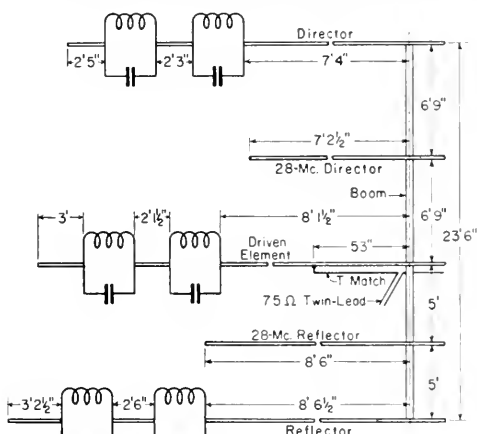


Fig. 3—Dimensions of the 3-band parasitic beam found optimum at W3DZZ. Dimensions are, of course, duplicated on the opposite side of the boom.

ments made across each band. Proper dimensions are given in Fig. 1A.

### Trap Construction

The values of  $C$  and  $L$  used in the traps are quite critical. The capacitance should first be adjusted accurately to  $60 \mu\mu\text{f.}$ , then the inductance should be trimmed until the trap resonates at 7200 kc. This should be done before the traps are inserted in the antenna. The inductance will be approximately  $8.2 \mu\text{h.}$  The traps made by the author are 6 inches long and weigh only 6 ounces and the  $Q$  is well over 100. They will withstand the voltage developed by a 1-kw. transmitter. Samples are shown in the photograph. The wire-antenna capacitor is made up of concentric lengths of 1-inch and  $3/4$ -inch aluminum tubing separated by polystyrene tubing with  $1/8$ -inch

walls, molded around the inner conductor. The polystyrene is also flowed into a series of holes in one end of the outer conductor so that the strain of the antenna will not pull the assembly apart. The inductor is wound with No. 14 wire and is concentric with the capacitor. The inductor is weatherproofed by molding it in insulating material. Other construction might be used, of course. As an example, a conventional inductor and capacitor could be enclosed in a plastic box, suspended across an insulator. This would, however, add to the weight.

### A Three-Band Parasitic Beam

The principle of isolating sections of an antenna with resonant traps has been applied to a parasitic beam antenna that operates on 10, 15 and 20 meters. This array with dimensions is sketched in Fig. 3. The array is a five-element job on 10 meters, with two reflectors spaced approximately 0.15 wavelength, and two directors spaced approximately 0.2 wavelength. On the other two bands, three elements are active. On 15 meters, spacings are approximately 0.22 wavelength for the reflector and 0.29 for the director. On 20 meters, the approximate spacings are 0.14 and 0.2, respectively.

Fig. 4 shows a breakdown of a suggested method of construction of the three main elements. Each element starts out with a 12-foot center section to which various sections are added at each end. Provision is made for adjusting the length from the center of the element to the first (28-Mc.) trap, the length between traps, and the section on the outside of the second (21-Mc.) trap. The photograph shows an example of the array traps used by the author. Here,

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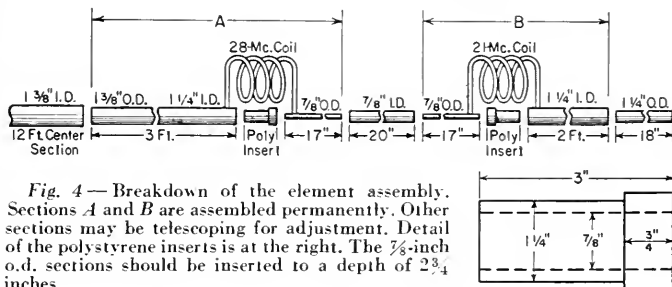


Fig. 4—Breakdown of the element assembly. Sections A and B are assembled permanently. Other sections may be telescoping for adjustment. Detail of the polystyrene inserts is at the right. The  $7/8$ -inch o.d. sections should be inserted to a depth of  $2 3/4$  inches.



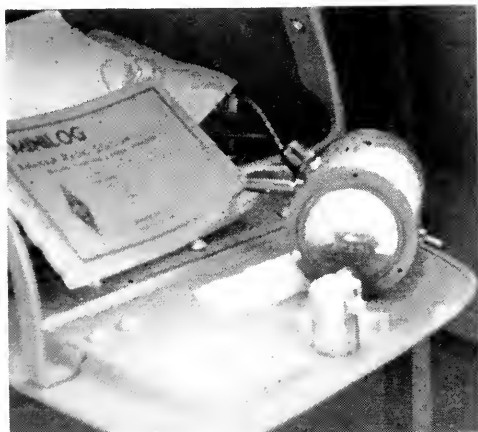
# The "Hidden Gem"

## A Field-Strength Indicator for Mobiles

BY CLIFFORD ABEL,\* W8IWB

• All mobileers will find this little gadget mighty convenient and valuable. A simple field-strength indicator helps to tell you when you are getting the most out of your rig on any band.

ONE of the main problems besetting today's struggling mobileer is getting maximum power output from his installed equipment. Considering the relatively low-power input and poor antenna radiation efficiency with which he must contend, the mobile operator can ill afford the additional losses of improper antenna or transmitter tuning. After the transmitter and antenna of his choice have been installed, he must make the most of it no matter what his power input or what the inherent efficiency of his antenna system may be. What could be a better method of making the most of it than by measuring the relative strength of the radiated field as



The field-strength indicator is mounted on the inside of the glove-compartment door, oriented so that it can be seen easily from the driver's seat. The antenna banana plug is at the left rear, the sensitivity control is at the upper left, and the slug screw of the inductor at the lower right. Small holes in the top of the can provide access to the sheet-metal screws holding the unit to the glove-compartment cover.

the antenna and transmitter tuning are changed! In other words, use a field-strength indicator.

Nearly any type of field-strength meter could be used to do the job. A de luxe commercial meter borrowed from a fixed station or a simple crystal rectifier in series with the low-current scale on your volt-ohmmeter will work with a proper pick-up antenna. But most desirable is a

unit which is an integral component of the mobile system — an indicator that will give a relative power-output measurement from minute to minute, and day to day.

You may have already been convinced of the value of a mobile field-strength indicator, but then the question arises of where to put the thing. Your under-dash mounting space may be pretty well used up by now, so why not stick it in the glove compartment? In there it's completely out of the way and out of sight. Better

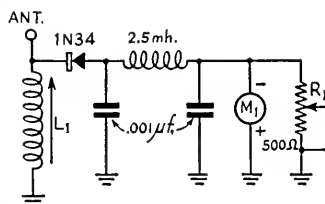


Fig. 1 — Circuit of the field-strength indicator.  $L_1$  and  $M_1$  are discussed in the text.  $L_1$  should be approximately 200  $\mu$ h.

yet, if you mount it on the inside top of the glove-compartment door, it will take up little of the useful space in the compartment. When the door is opened, the indicator drops down into a position where the scale can be seen easily, and the compartment light illuminates the meter for nighttime operation. Two small sheet-metal screws can be used for mounting.

### Construction

The circuit, shown in Fig. 1, is conventional, and none of the values is critical. Nearly any type of crystal detector can be used, and the meter movement can be anything from 50  $\mu$ a. to 2 ma. or more, depending upon the size and placement of the pick-up antenna and your transmitter power output. All the components are housed in a small tin can. The round can is available and cheap, and takes up less space than other types of housing. It doesn't look half bad if it's new and shiny, or if you give it a coat of black crackle paint. The can is the 8½-ounce size. That's the same diameter as a can of Campbell's soup, but somewhat shorter. Of course, the smaller the meter you can find, the smaller the can may be. The pick-up antenna lead-in comes in to a banana plug. Thus, the whole assembly can be detached quickly from the car and can be used anywhere that a field-strength indicator might be needed. By using the terminals on all the fixed-mounted components and one 3-point soldering-terminal strip, all the other components may be mounted easily and compactly.

(Continued on page 130)

\* 783rd AC&W Squadron, Charleston, W. Va.

# Transmitter Hunting – Seattle Style

## *A De Luxe D.F. System for Ten Meters*

BY J. ALAN DUNCAN,\* W7OTA

• This story on hidden-transmitter hunting should strike a response in every mobile ham. It includes, along with other useful information, descriptions of a special S-meter circuit and a direction-finding loop with suggestions for mounting.

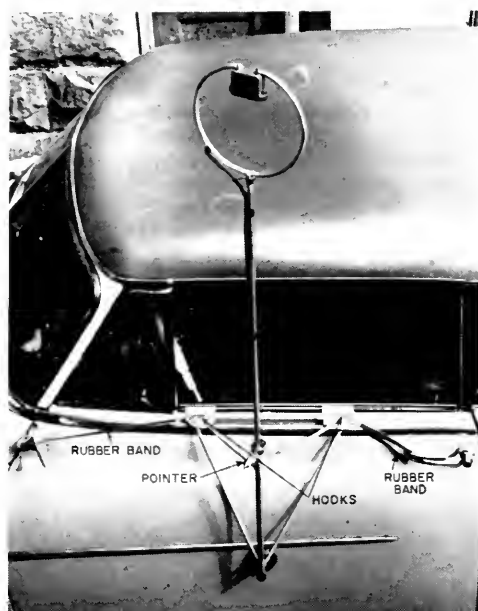
WITH civil-defense and disaster-relief training on the steady increase throughout the nation, it becomes more and more necessary that amateur mobile stations be kept ever alert and active, so they may supply that vital communication link so important if the situation should arise. Hidden-transmitter hunting has been found to be one of the best drills for keeping the mobiles trained for this type of activity, because it develops the qualities required for successful emergency mobile communication. It also affords more thrills, more opportunity for technical development, and more participation by the whole family, than most other phases of amateur radio. The mobile operators in the radio clubs of Seattle, Washington, have been kept active on 29 Mc. almost continually since Don Newman, W7CO, first brought hidden-transmitter hunting to Seattle some five years ago.

Various methods and techniques are used to locate the hidden transmitter, depending upon the equipment on hand and the ingenuity of the hunter. Some mobileers do remarkably well with just their transmitting whips, using the directional characteristics of the car, and by determining the signal strength by ear. The author prefers a more exact method, however, and describes the following equipment and tracking technique for those mobileers who would use a more scientific approach to this exciting sport.

### *The Loop*

Essentially, a directional loop and a signal-strength meter are the required auxiliary equipment for successful hunting. The author's loop is a one-turn resonant circuit, nine inches in diameter, requiring about  $65 \mu\text{f.}$  of capacity to tune it to 29 Mc. The signal is fed from the loop to the receiver through a 50-ohm coaxial cable which is gamma-matched to the loop. Fig. 1 shows the loop dimensions and the method of coupling the coaxial cable to it. The loop diameter is not especially critical so long as it is kept small (under about 10 inches), and any discrepancy may be compensated for in the adjustment of the variable capacitor. The dimension of the coupling

tap is shown only as a starting value. Further adjustment will be required in the tuning process. For the tuning capacity the author is using a  $50\text{-}\mu\text{f.}$  fixed capacitor in parallel with a  $25\text{-}\mu\text{f.}$  variable capacitor (Hammarlund APC-25). This tuning arrangement was arrived at after some experimenting, and has been found to be very steady and extremely easy to tune. The capacitor combination is enclosed in an old surplus capacitor casing (Sangamo type F-2) with the original capacitor removed. With a new sealed-in fiber



The loop assembly mounted on W7OTA's car. The mounting is a triangular framework of tubing or rods with plates that hook over the window frame, and a rubber suction cup at the bottom. The loop mast revolves in a section of tubing. Large rubber bands to the external rear-view mirror and door handle help to hold the assembly in place.

bottom cover, this makes a nice weatherproof housing.

The type of stock used, the method of mounting the loop to the car, the dimensions of the mount, etc., will certainly vary with desire and circumstances. The author constructed his loop and mount entirely of duralumin tubing, though most hunters use copper for the loop. The style and mounting are shown in the illustration.

### *Adjustment*

Tuning the loop is a very simple process. Connect it through the coaxial cable to the an-

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tenna terminal of the receiver. Radiate a 29-Mc. signal with a grid-dipper, r.f. signal generator, or some other calibrated source, and tune the loop to resonance as indicated by maximum signal. The loop should also be rotated for maximum, and then rocked back and forth across maximum as the capacitor is being adjusted. Then adjust the gamma match by moving the connection back and forth along the loop until maximum transfer is indicated. This may throw the loop off resonance, so the processes should be repeated until neither causes any noticeable improvement. The loop should be tuned very carefully, otherwise a sharp null may not be obtained. Although the maximum signal is used when tuning the loop, the minimum signal (null) is used when locating the hidden transmitter. This is because the angle of minimum is so much smaller than the angle of maximum signal.

### S-Meter

Difficulty is usually encountered in trying to tell a difference between maximum and minimum signal by ear as the hunter closes in, and a signal-strength meter becomes very desirable. A meter in the cathode circuit of one of the a.v.c.-controlled tubes was tried, but the change in deflection from maximum to minimum signal, as the hidden transmitter was approached, was as indistinguishable as by the aural method. The author finally came up with the amplifier-bridge circuit shown in Fig. 2. This system operates by sampling the a.v.c. voltage, amplifying the voltage change causing a change in the plate resistance of the 6C4 tube. This change in plate resistance upsets the balance of the bridge circuit (see equivalent circuit in Fig. 2B), causing a difference of potential to exist between points D and B. The resulting current flow through the meter causes the needle to deflect. Potentiometer  $R_1$  is a gain control and governs, to a certain extent, the amount of deflection of the meter. Potentiometer  $R_2$  is the zero adjustment used to balance the bridge. As the signal of the hidden transmitter changes in intensity, both the gain and zero controls will need adjusting. A

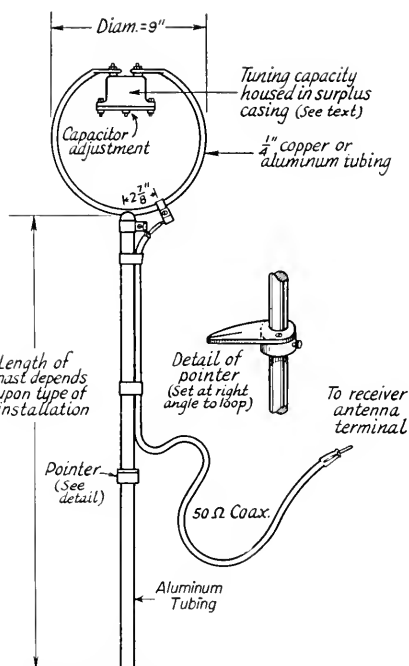
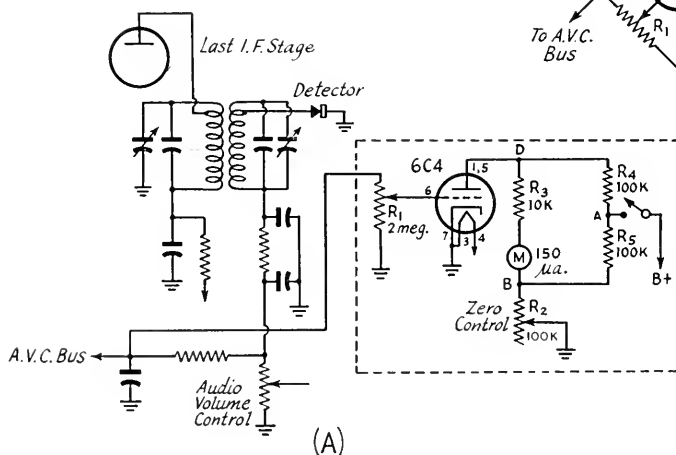


Fig. 1 — Sketch showing details of the 10-meter d.f. loop.

little technique is involved in making these adjustments during the short transmissions from the hidden transmitter, but after a couple of bunts it will be accomplished very simply. Also, the hunter will find that with a little practice, the sensitivity and gain of the amplifier-bridge S-meter can be adjusted such that full-scale

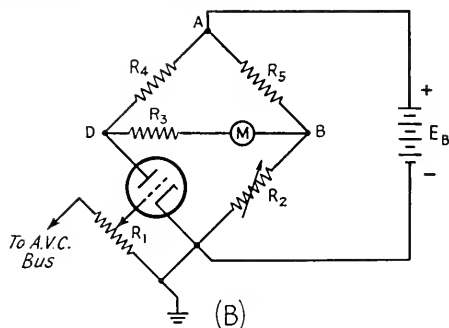
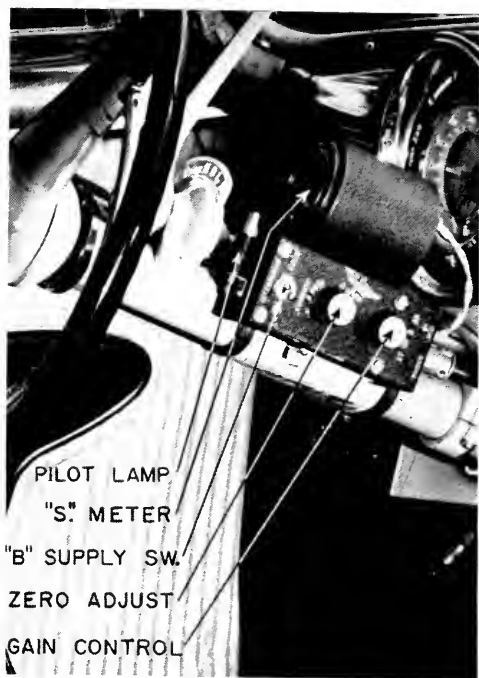


Fig. 2 — A — Schematic diagram showing the circuit of the S meter with sensitivity control and how it is connected to the receiver a.v.c. bus. B — Equivalent bridge circuit.



Close-up showing the S-meter unit mounted on the steering post.

deflection is possible (from maximum to minimum signal during rotation of the loop) regardless of whether the transmitting station is very weak and distant or whether he is within a few feet. As a matter of fact, on a particular hunt, W7CO (the hidden transmitter that night) was asked by the author at the beginning of the hunt if he was using his mobile whip or his receiving antenna for transmitting. The hidden transmitter operator replied that the hunters would have to loop in and find out. When the author arrived alongside the hidden transmitter and asked for a transmission, he was able to develop a very definite null (actually more than full-scale deflection) with the pointer directed at the rear transmitting antenna, less than four feet away.

None of the leads in this circuit need be

shielded, and the lengths are not critical. Also, don't put off making this unit just because you don't happen to have a 150- $\mu$ a. meter, as some of the boys are using 1-ma. meters with quite good results. Even the 6C4 tube may be replaced by practically any other triode tube. Half the fun is in experimenting with various values and components.

The S-meter unit may be housed in any convenient chassis or box. The author originally mounted his S-meter under the dash, next to the transmitter control unit. This was difficult to read without stopping the car, so the unit was rebuilt into a surplus pilot's control box, with the meter mounted just above in an old coil shield can. This unit was then hung on the steering column. This proved to be a very handy location. Finally a pilot lamp was installed so as to illuminate the meter and is very helpful for night hunting.

Various techniques are used to track down the hidden transmitter or "bunny" as he is referred to in Seattle. The author has used the triangulating method of pin-pointing the bunny by using a map, etc., but doesn't recommend it because it is too undependable. This is especially true in hilly country. Such phenomena as reflections, wave-polarization changes, and antenna effects will cause some readings to be in error by a considerable amount. This makes a very discouraging triangulation plot on a map, in addition to a possible waste of considerable time. The errors reduce to insignificance as the hidden transmitter is approached, however, and regardless of the system or technique used, if complete trust is placed in the loop, the hunter should eventually arrive.

#### Typical Operation

At 7:15 P.M., on the first and third Thursdays and second and fourth Fridays of the month, the Seattle mobileers (usually some ten cars) assemble in front of the museum at Volunteer Park. They proceed to tune their loops and ready themselves for the bunny hunt. At 7:30 P.M., the operator of the hidden transmitter calls, "QST, QST, QST. This is W7QPR mobile (or whatever

*(Continued on page 134)*

◆  
W7OTA all set to start out on a hidden-transmitter hunt.  
◆



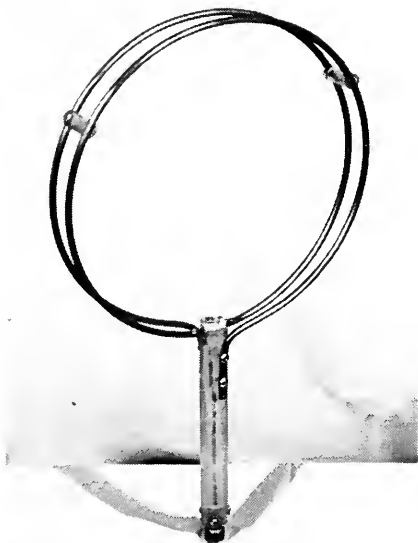
# Unidirectional Loops for Transmitter Hunting

*Less Guesswork in Mobile D.F. Work*

BY WARREN U. AMFAHR,\* W0WLR

**M**OBILE hams in the Wichita area have been running 10-meter hidden-transmitter hunts each week for the past three years or more. Not long after these hunts were inaugurated, it became evident that the affairs were rapidly degenerating into rat races. Under the usual rules, where the first car to arrive at the site of the transmitter was declared the winner, the honor system for compliance with existing speed limits failed completely. It became obvious that the contests would have to be conducted along different lines, if they were to be continued on a safe and sane basis. In the interest of public safety, we felt that we could not continue to encourage speedy and hazardous driving. We realized too that our call license plates and long

• This article not only describes the construction and use of a d.f. loop that eliminates much of the uncertainty in making "fixes" in fox hunts, but it also contains some interesting observations regarding the conducting of this highly popular activity.



The unidirectional 10-meter d.f. loop is a simple affair, consisting of two turns of copper tubing mounted on an insulating rod. Directivity is adjusted by the trimmer condenser at the center.

whip antennas could easily draw attention to us in any adverse publicity.

For some time now, we have been operating under a scheme in which precision and skill are substituted for speed and recklessness. The time element has been eliminated entirely, and all hunts are now based on the mileage covered

between a common starting point for all cars and the hidden transmitter. Speedometer readings are recorded at the starting point, and again when the car reaches the objective. There is no time limit, and the winner is the one who reaches the hidden-transmitter site over the shortest route.

The changes in rules naturally have brought about a search for more accurate direction-finding gear, rather than speedier cars. Perhaps the most important result has been the adoption of a unidirectional loop antenna by the hunters. It has eliminated the possibility of starting out in exactly the opposite direction, and reduced the probability of overshooting the transmitter. In eliminating the necessity for triangulation, it has simplified the hunting technique, and placed it more within the grasp of the YL and Jr. Ops.

The unidirectional loop antenna works on rather well-known principles. In simple terms, a loop that is not accurately balanced in respect to ground will exhibit two modes of operation. One mode is that of a true loop, while the other is that of an essentially nondirectional vertical antenna of small dimensions. The voltages introduced by the two modes are out of phase, and will add or subtract, depending upon the direction from which the wave is arriving.

The theoretical true loop pattern is illustrated in Fig. 1A. When the voltage introduced by the antenna mode is large, the nondirectional pattern of the vertical-antenna mode predominates, and the loop will show little directivity, as shown in Fig. 1B. When the antenna effect is small, one of the loop lobes will be reduced, while the other will be correspondingly enlarged (see Fig. 1C). When the voltages introduced by the two modes are equal and 90 degrees out of phase, one of the lobes will be canceled out, making the loop unidirectional, as indicated in the pattern of Fig. 1D.

Since the loop pick-up will usually be predominant, when the dimensions of the loop are small in terms of wavelength, the loop and antenna effects can be balanced by detuning the

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loop so as to reduce its pick-up to equal that introduced by the antenna effect.

The loop shown in the photograph consists of two turns of  $\frac{1}{4}$ -inch copper tubing, 11 inches in diameter. The two ends are flattened out,

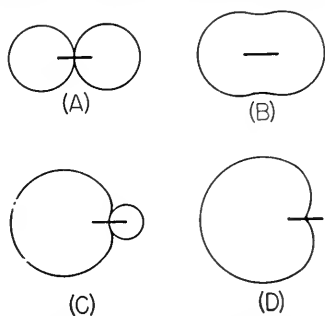


Fig. 1—Small-loop field patterns with varying amounts of "antenna" effect. The heavy lines show the plane of the loop.

and fastened to opposite sides of a 1-inch diameter insulating rod that serves as a mounting. The center of the loop is broken, and a 20- $\mu$ f. mica trimmer is inserted in series. The ends of the tubing at the break are supported in a slot cut in the end of the insulating rod. The rod of the loop shown in the photograph is a piece of 1-inch polystyrene. However, a piece of ordinary broomstick will provide adequate insulation.

The loop is connected to the receiver input with a length of coax cable. After the receiver has been tuned to the desired operating frequency, the trimmer condenser in the loop should be adjusted for maximum background noise. If no peak in noise can be found, the condenser range value should be changed. An 11-inch loop should require no more than 5 to 15  $\mu$ f.

Once a noise peak has been established, a signal and the receiver S-meter should be employed. (If the mobile receiver is not equipped with an S-meter, the circuit of Fig. 2 can be

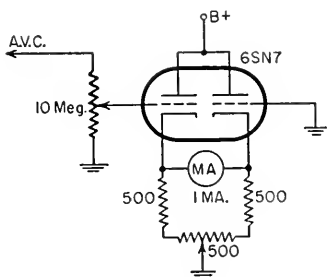


Fig. 2—S-meter circuit widely used in transmitter hunting.

added.) The capacity of the loop condenser should then be carefully reduced until the loop acquires a unidirectional characteristic. The final setting of the trimmer condenser depends upon the front-to-back ratio desired. Complete cancellation of signals from the back can be ac-

quired at the expense of a certain amount of frontal signal pick-up.

This type of loop is, of course, oriented for maximum signal in contrast to a conventional d.f. loop which is usually worked on the signal null. In the use of the loop, it will be found that resonant antennas or other objects are highly capable of receiving signal energy and reradiating it. The possibility of the loop receiving reflected signals from the mobile whip should be thoroughly investigated. Usually, the loop when used on one side of the car will be more susceptible to whip reflections than it will be on the other. This depends upon the car body contour and the distance between the loop and the whip. In some installations, it may be necessary to pull the whip down while taking loop bearings.

In the process of hunting, it is advantageous to keep the hidden transmitter on the loop side of the car. The maximum-to-minimum signal, and the exact direction, will be less pronounced if the loop has to look across a reflecting or diffusing car roof. Whenever the loop is used in the vicinity of a strong signal, some means of attenuating the antenna circuit should be used, rather than to decrease the S-meter sensitivity. Various resistor values, switched in parallel with the antenna input, will achieve this.

Those who organize, or participate in, this popular activity will find that many headaches will be avoided if the rules place strong restriction against hunting or hiding on private property. We have also found it highly advisable to notify the local police in advance of a scheduled hunt. Summer-night hunts, with dozens of dangling loops and seeking searchlights, can load the police telephone circuits with curious inquiries!

## Strays

W5UNP, enjoying a late-afternoon 75-meter QSO while parked and waiting for his NYL to QRT work at WBAP-TV, was confronted by one of the station engineers: "You're 50 per cent station level on the program monitor in master control!" the ex-ham engineer exclaimed.

You just can't get away from 'em!

### COMING A.R.R.L. CONVENTIONS

May 21st-22nd — Pacific Division, Fresno, Calif.

June 10th-12th — West Gulf Division, Fort Worth, Texas

June 11th-12th — Southeastern Division, St. Petersburg, Fla.

August 12th-13th — Roanoke Division, Old Point, Va.

October 8th-9th — Central Division, South Bend, Ind.

# Meet the S.W.R. Bridge

## Simple Instrument for Adjusting Antenna Circuits

BY LEWIS G. McCOY, W1ICP

• Here is a nontechnical description of how to build and use a standing-wave-ratio bridge, an inexpensive instrument that is worth many times the small outlay for its construction. The use of such a bridge will help you to solve some antenna-circuit problems that can be solved in no other way.

**D**ID you ever stop to wonder if your transmitter was properly coupled and matched into the antenna or antenna coupler? If you're the average ham, this problem has probably bothered you a great deal. Well, there is one simple way to find out, and it won't cost you more than a few dollars.

When working with antennas and antenna couplers, the standing-wave-ratio bridge is practically an indispensable instrument. With the s.w.r. bridge, it is possible to know when the coax line between the transmitter and antenna coupler is matched, or if a coax-fed antenna is properly matched to the feed line. When a low-

pass filter is used to attenuate harmonics, it is important to keep the s.w.r. low in the connecting line, otherwise there is always the possibility that the filter may break down. By setting the system up with the s.w.r. bridge, one can be sure the filter will be working in a line with a low s.w.r. It has been mentioned that the s.w.r. bridge only costs a couple of dollars; another attraction is that the unit is very easy to build.

### S.W.R. Bridge Construction

As can be seen from Fig. 1 and the photographs, the bridge consists of four resistors, two

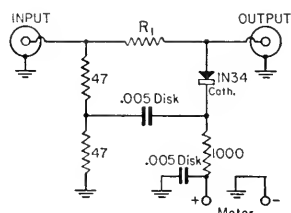
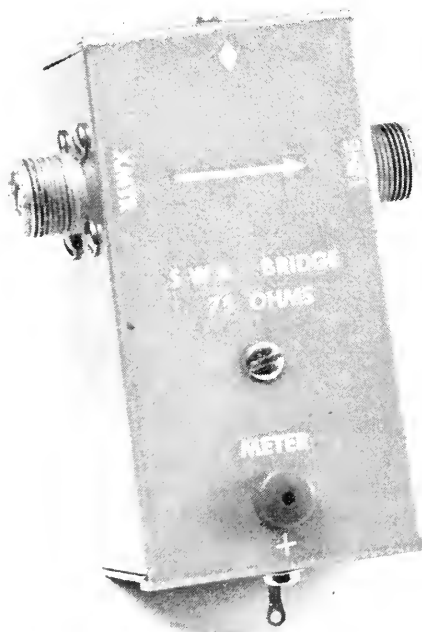


Fig. 1 — Circuit diagram of the s.w.r. bridge. All resistors are  $\frac{1}{2}$  watt, composition type,  $\pm 10$  per cent tolerance.



Top view of the bridge. Be sure to mark the input and output connectors to avoid mistakes when using the unit. The lug at the bottom end of the case offers a clip-on point for the minus side of the meter.

condensers, a crystal diode, an isolantite stand-off, two coax connectors and a chassis. A tip jack is used for the + meter terminal, and the chassis case for the - side. The value of  $R_1$  will depend on the type of coax the bridge is designed for. If for 52-ohm line, then  $R_1$  would be a 50-ohm resistor, and the value would be 75 ohms if 72-ohm coax is used. Whichever type is used, buy two resistors, because one will be used in the bridge and the other for testing the unit. All of the resistors are  $\frac{1}{2}$  watt, and be sure they are composition-type and not wire-wound.

In the construction of the bridge, the resistors and the crystal should be mounted at right angles to each other, as shown in the photograph. This is done to avoid stray coupling that might give erroneous readings. The unit shown in the photographs was built in a  $4 \times 2 \times 1\frac{1}{2}$ -inch channel-lock box. If this size is used, it should be simple to follow the layout in the photograph.

When soldering the leads of the crystal diode, the leads should be held by a pair of pliers in order to conduct the heat away from the crystal. Don't hold the iron to the soldering point any longer than necessary, as it is easy to damage the crystal with excessive heat.

### Testing

The completed unit is connected to the transmitter with a piece of coax of the proper impe-



dance, the coax going to the input side of the bridge. A 0-1 millimeter is connected to the bridge with the + side of the meter going to the pin jack and the - side to the chassis. The output side of the bridge is left open.

The next step is to adjust the transmitter output so that a full-scale reading is obtained on the 0-1 meter. A very small amount of r.f. is needed for this, so it may be necessary to turn off the final amplifier and just allow the driver stage to run. If the transmitter has a drive control, such as the Viking and Viking Ranger, it is merely a matter of advancing the drive control to a point where full-scale reading is obtained. With the meter reading full scale, the test resistor is connected between the output coax connector's inner conductor and the shell or ground side of the connector. The reading on the meter should drop to, or near, zero. If the reading is appreciably above zero, there is stray coupling between the resistor arms in the bridge, and their placement should be carefully checked and changed if necessary.

Several different resistors of the same value were tried in testing the unit shown, and in every case the reading dropped to zero, indicating that the 10 per cent tolerances were close enough for the purpose.

### Using the S.W.R. Bridge

For an example of using the bridge, let's assume we have an antenna fed with open-wire line, and that an antenna coupler is used with

the open-wire line. A length of coaxial line connects the transmitter to the coupler. Such a system is illustrated in Fig. 2A. Our problem is to

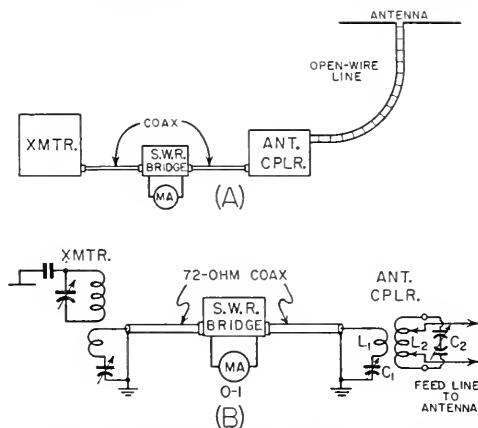


Fig. 2 — At A we see the typical layout described in the text. At B the schematic shows the actual connections one would make for using the bridge.

take the power out of the final amplifier and get it to the antenna coupler, with as little loss on the way as possible.

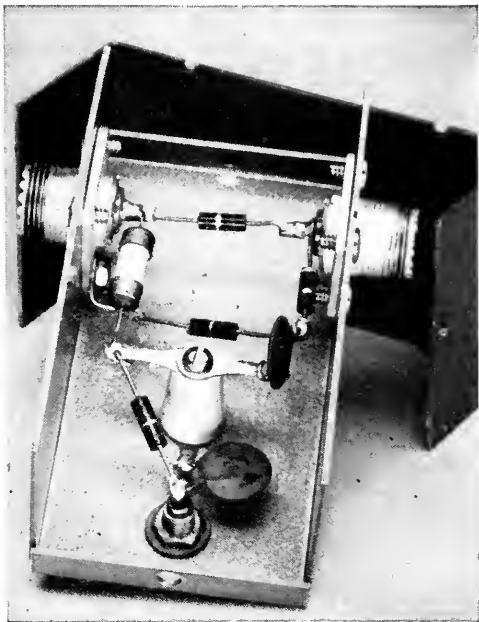
The Novice will probably wonder why an antenna coupler is used instead of connecting the open-wire line directly to the output terminals of the transmitter. The feeders could be connected directly to the transmitter, but it greatly simplifies coupling problems to use an external antenna coupler, particularly if the antenna is to be operated on more than one band.

Where most amateurs run into trouble with a system such as this is in adjusting the coupler and getting the transmitter to load. With an s.w.r. bridge inserted in the coax line between the rig and the coupler, it becomes an easy job to adjust the coupler to the proper operating values. An ideal set-up, for adjusting the coupler, and the link at the coupler, is shown at Fig. 2B. This coupler, incidentally, is the unit described at Fig. 13-32 in the 1953, '54, and '55 editions of *The Radio Amateur's Handbook*. Complete details are given for component values.

The bridge of Fig. 1 does not make actual s.w.r. measurements — this takes a more complicated bridge — but it shows when the s.w.r. is a minimum and as such is used to adjust the coupling system for a good match.

The first step is to set the meter to full-scale reading with the output side of the bridge disconnected. Once full-scale reading is set on the meter, the transmitter controls are not touched again for the test unless the frequency is changed. The coax line from the antenna coupler link is then attached to the output side of the bridge. The feed-line taps are attached to  $L_2$  at or near the outside turns of the coil, making sure they are equidistant from the coil ends. The coupler capacitor  $C_2$  is then tuned for minimum reading on the milliammeter. When this point is reached,

(Continued on page 138)



Inside view of the s.w.r. bridge. The resistor connected between the inner conductor pins of the coax sockets is  $R_1$ . One of the 47-ohm resistors is on the right, connected between the inner conductor pin and the junction of a 0.001-uf. disk condenser and the other 47-ohm resistor. Note the three resistors are mounted at right angles to each other. The 1000-ohm resistor at the lower left is connected between the tie point and the meter terminal.

# • On the TVI Front

## ADJUSTING LOW-PASS FILTERS

To adjust a low-pass filter for maximum attenuation of harmonics falling in a particular TV channel, it is often necessary to unsolder the coils used in the low-pass and adjust their inductance using a grid-dip meter. A short-cut that possibly provides more accurate tuning is to insert the filter into the TV receiver antenna feed line and tune for maximum attenuation of the TV picture on the critical channel. This method may be criticized by those who take a dim view of the mismatch created by inserting a 52- or 75-ohm low-pass in a 300 ohm line—but it works!

— *Kenneth Montgomery, W5ABY*

## MORE ON SIGNAL SHIFTER TVI SUPPRESSION

Some months ago a method was shown for reducing harmonic radiation from the Meissner Signal Shifter.<sup>1</sup> It was tried and found inadequate in suppressing harmonics which interfered with Channels 2 and 4 at this location.

It was found that quite a bit of r.f. was being picked up by five 115-volt a.c. leads which go to the rear of the chassis from the switch on the front panel. These were inserted separately in shielded copper braid grounded in the center and at both ends. This reduced r.f. in the a.c. line about 50 per cent.

Further inspection revealed that the output link coils in the turret are closely coupled to the plate inductances of the 807 stage. It was reasoned that if the output coils were tuned, the harmonics should be considerably reduced. An external assembly mounted in a small aluminum box (Fig. 1) was used to accomplish this objective.

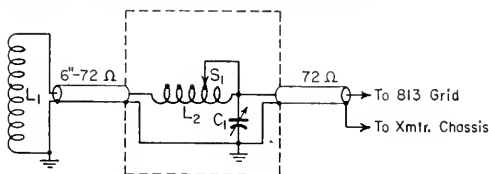


Fig. 1—Schematic of external assembly for additional TVI suppression in the Meissner Signal Shifter.

- C<sub>1</sub> — 75-μμf, variable (low-loss).
- L<sub>1</sub> — Output coil of Signal Shifter.
- L<sub>2</sub> — 10 turns No. 18 plastic insulated on 1-inch steatic form tapped as follows: 3.5 Mc. — whole coil; 7.0 Mc. — 8 turns; 14.0 Mc. — 6 turns; 21.0 Mc. — 4 turns; 28 Mc. — 2 turns.
- S<sub>1</sub> — 5-position s.p. ceramic rotary.

The completed unit was fastened to the rear of the Signal Shifter. This unit consists of a tapped coil in series with the output coil of the VFO through a 6-inch length of 72-ohm coax. In addition, a 75-μμf. variable capacitor was connected from the output side of the tapped coil to ground. Another 72-ohm coax line was used to connect the external assembly to the untuned grid of an 813 final.

<sup>1</sup> McCoy, "Suppressing TVI in the Meissner Signal Shifter," *QST*, Oct., 1953.

Measurements showed that harmonic radiation was almost completely eliminated, and as further proof, the interference in the TV set disappeared.

— *M. J. Grainger, KP4JE*

## TVI COMPLAINT

2160 N. Mason Ave.  
Chicago, Ill.

Editor, *QST*:

On Friday, January 21, 1955, I received rather unique publicity in one of Chicago's newspapers about a case of TVI that came to me via the Presidential office in Washington, D. C. Apparently some of the other news services picked up this "scoop," adding or subtracting their own twist, resulting in nation-wide radio and newspaper publicity. I received considerable mail about this matter and believe an explanation is in order.

The transmitter in use here is a Viking II, equipped with a low-pass filter. My operation is on the 40-meter 'phone band, and I have no interference on TV receivers in my own home. Extensive checks have been made with several neighbors and no TVI was encountered.

After becoming aware of this much publicized case of TVI, through the local FCC office, I had my son, who is a TV engineer and also a radio amateur, conduct an investigation. The complainant's TV receiver is one of a well-known manufacturer, about six years old. Both the audio and video on all channels (2, 5, 7, and 9) were being affected in the same manner. My son installed a high-pass filter.

Tests were conducted which proved that the cause of this TVI was definitely the TV receiver. The complainant promised to contact the manufacturer and have them install a high-pass filter.

I am writing this in the hope that it may clarify the amateurs' side of the story. — *Anthony Shragal, W9SEF*



... With the Wouff-Hong in his right hand, and typing with his left, the editor proceeds to lambaste those careless operators who have been found in large numbers outside the bands, clobbering AT&T and USN circuits.

... Continuing the theme of the editorial, the first technical article deals with a description of an extremely accurate frequency standard, written by J. K. Clapp and John D. Crawford.

... "The Old Connecticut Yankee" passes out some timely advice on "coöperating with the BCL," in his usual helpful fashion.

... How to build—and how not to build—a 20-meter 'phone transmitter is discussed by Beverly Dudley, with full plans for a particular rig, using push-pull UX-210s in the final, modulated by parallel UX-250s.

... Clark C. Rodimon explores the use of electrolytic condensers in transmitter high-voltage power supplies.

... The Old Man announces he's back on the scene, complete with Rettysmith, Wouff-Hong and the pot of boiling transformer oil to get the Young Squirts back on the straight-and-narrow.

... George E. Fleming describes a high-gain direct-coupled power amplifier for audio frequencies, with comment on the relative merits of transformer, condenser and direct coupling.

... Some constructional hints are described by George Grammer, including the use of old tube bases as coil forms, shielding, winding copper tubing, and insulating shafts from metal panels.

... Station W9BVII is featured as the station of the month, and with good reason. The three-tube exciter unit is laid out in a unique circular form, and both exciter and driver are shielded. The final is a UX-852 running about 450 watts input.

# A Mobile S.S.B. Receiver for 80 and 40

## Using a Tunable I.F. and Crystal-Converter

BY ROBERT A. THOMASON,\* W4SUD

• Here is some sound reasoning on what should go into a good receiver for mobile work, and some suggestions on how to work over a BC-453-A to meet those requirements. If you have a BC-453-A that is now gathering dust, this is your meat.

WHAT FEATURES would an ideal amateur mobile receiver have for a.m., c.w., and s.s.b. reception? While everyone might not agree across the board, the writer believes they should include:

- 1) Exceptional frequency stability (for s.s.b.).
- 2) Good selectivity ( $2\frac{1}{2}$  kc. at 6 db. down).
- 3) Adequate sensitivity.
- 4) Plenty of bandwidth.
- 5) Good calibration (reset within 2 kc.).
- 6) Built-in automatic noise limiter.
- 7) Automatic volume control.
- 8) Stable b.f.o. (with switch control).
- 9) Separate a.f. and r.f. gain controls.
- 10) Independence of b.e. receiver.
- 11) Low image response.

Wait a second! That's a lot of receiver. You've got to make it fit somewhere in the family jalopy and operate it from an average car battery. Well, then, let's make the next two features:

- 12) Compactness (under-dash mounting).
- 13) Reasonable power consumption (100 ma. at 250 volts).

Assuming these specifications could be met, who could afford it? Also, the average amateur does not have the "know-how" or test equipment to build it. So we have:

- 14) Moderate cost.
- 15) Simple construction.

This receiver was realized in the writer's mobile station by converting a BC-453-A low-frequency (190-550 kc.) Command receiver.

At this point, the one drawback this receiver does have should be mentioned: Limited frequency coverage (3.5 and 7 Mc.).

This is rather serious for many mobile enthusiasts. However, by adding a high-frequency converter with output on 40 or 80 meters, the higher frequencies can also be covered with the possible partial loss of stability, bandwidth, and calibration, depending upon the quality of the converter.

### Changes & Additions

The following additions and modifications were performed on the BC-453-A to obtain our almost-super mobile receiver:

- 1) Add a crystal-controlled pentagrid converter (6BE6). This is mounted on the rear apron of the receiver originally occupied by the dynamotor. The Command receiver is used

as a tunable i.f. amplifier from 190 to 550 kc. A different crystal is used for each 360 kc. covered. The crystal switch could include a crystal for WWV or perhaps a local broadcast frequency.

- 2) Add one stage of audio amplification (6C4) between the second detector and power amplifier. The stage is mounted on a small subchassis underneath the receiver.

- 3) Add a.v.c.

- 4) Add shunt noise limiter (1N34).

- 5) Add a.f. and r.f. gain controls.

- 6) Replace all 12-volt tubes with their 6-volt equivalents. The 12A6 was replaced by a 6V6.

- 7) Rewire all heaters in parallel.

- 8) Replace the antenna trimmer capacitor with a unit that is screwdriver-adjusted from the side. The capacitor thus released was used as a b.f.o. pitch control.

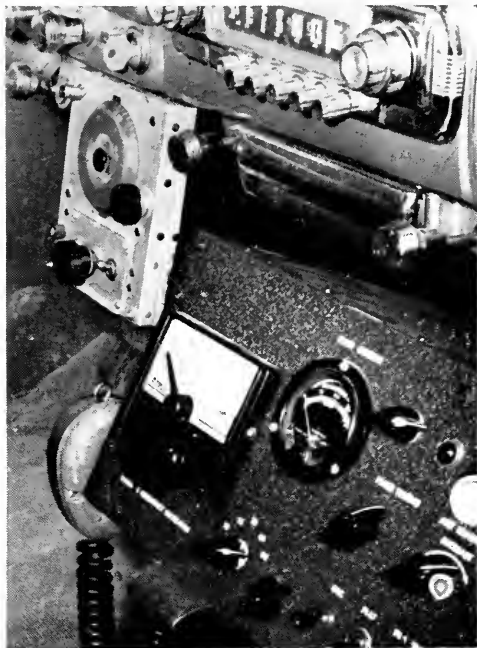
- 9) Add speaker and matching transformer.

### Details

Let's take each feature and study how it can be accomplished.

The frequency stability is exceptional in this unit. The crystal-controlled high-frequency oscillator, together with the excellent stability found in these receivers, makes s.s.b. reception easily possible even while driving over rough roads.

The BC-453-A has an intermediate frequency of 85 kc. and has six tuned i.f. circuits. This gives good selectivity. The selectivity with minimum coupling in each i.f. transformer is just sharp



A BC-453-A with a few revisions makes a good tunable i.f. amplifier for a mobile receiver. One is shown here tucked under the dash.

\* 1825 Cherokee Drive, Owensboro, Ky.



For those who do not own a BC-453-A, remember that although the price is considerably higher than a few years back, they are still well worth their money. Even at today's prices, this modified receiver costs less than the cheapest commercial converter.

The modifications are simple and require a minimum of test equipment. The average amateur should have no difficulty in this respect.

The 6BE6 crystal converter is built into a homemade metal box that just fills the space on the rear apron of the receiver. The simplicity of the circuit can be seen in Fig. 1. The only caution the builder should observe is to keep  $L_1$  and the r.f. chokes well separated. The controls,  $C_1$  and  $S_1$ , are mounted on the rear of the metal box. The side may be more convenient if space is available in the reader's car. However, it is only necessary to adjust them when changing bands, so the rear mounting is satisfactory.

The regular antenna post was removed and the hole plugged. A wire was soldered to the small mica condenser that was originally tied to the antenna post and then run along the inside top of the cabinet to the converter in the rear. This will minimize stray pick-up on the i.f. intermediate frequency. It is necessary to remove the top cover and variable-condenser cover in order to reach the antenna post. While these covers are removed, small holes can be drilled for the wire going to the converter. The heater choke mounted just below the dynamotor plug underneath the chassis was removed and discarded. This gave more working room. The wires going to the dynamotor plug were left as originally connected. The heater, B+, and ground leads were thus convenient to the converter by soldering to the banana plugs.

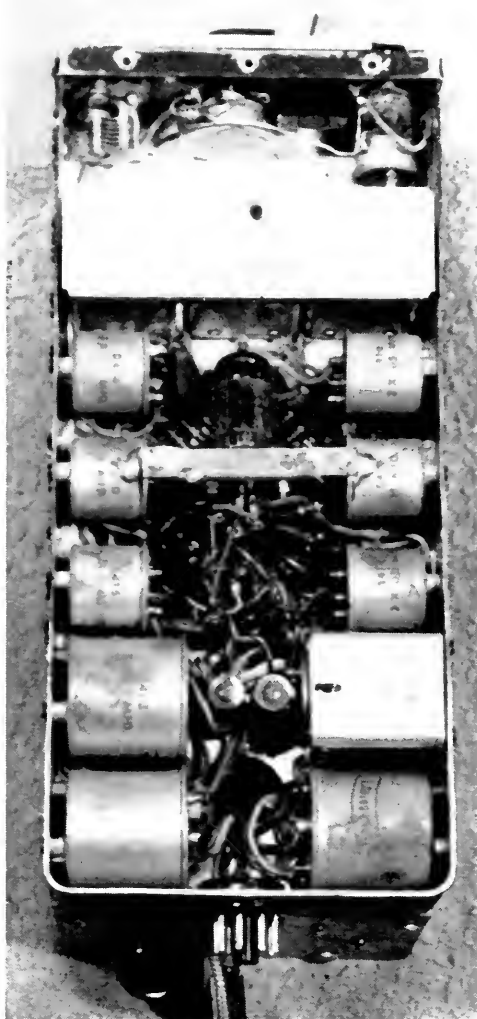
The socket on the rear of the receiver was removed and the hole enlarged to  $1\frac{1}{16}$  inches. This permitted the installation of a conventional octal tube socket. Plugs for these sockets are made by Amphenol and are available at most distributors. The only wires retained on this plug were ground, heater, B+, and audio output. The others were cut loose at their source and removed.

The wires and neon lamp were removed from the antenna trimmer condenser; then the stator plates were connected to Pin 6 of the 6SQ7 (formerly a 12SQ7). The antenna trimmer thus became a b.f.o. pitch control. A 30- $\mu$ fd. compression condenser was mounted on the side of the chassis to serve as a screwdriver-adjustable antenna trimmer. There is sufficient gain in the receiver for this antenna trimmer to be omitted entirely, if desired.

The small metal box and condenser mounted on the front panel should now be removed to make room for the audio and r.f. gain controls, b.f.o., a.v.c., and a.n.l. on-off switches. This makes things quite crowded, and miniature components should be purchased for use here. All the wiring going to the small metal box should be cut at its source and removed, except the green and red wires; these are r.f. gain and b.f.o.

"off," respectively. The r.f. gain control is a 20,000-ohm unit, and is connected to a switch that grounds it to turn the b.f.o. on. The wiring for the other controls is shown in Fig. 2.

The output transformer used in the original set was retained and a 2000-ohms-to-voice-coil transformer mounted at the speaker. This made



Under chassis view of the reworked BC-453-A. The metal strip running across the chassis at about the center is used to support the 6C4 socket.

a little less modification work than replacing the output transformer. Also, it made 2000 ohms output impedance available for headphones.

If the receiver is used for s.s.b. reception, for the sake of stability it would be more desirable to mute the receiver at the speaker rather than to remove B+ during transmitting periods. This is not a necessity even for s.s.b. reception, if the builder wishes to use his receiver supply for a portion of the transmitter.

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# Hints and Kinks

## For the Experimenter



### THREE-WAY SWITCH FOR THE SIMPLEST MODULATOR

OPERATORS who employ the "Simplest Modulator" for casual 'phone operation with their existing c.w. rigs must remember to unplug the modulator whenever the mode of operation is changed from 'phone to c.w. Of course, if the cathode of the final is keyed and if the modulator output terminals are connected in parallel with those of the key, the unplugging motion is unnecessary. However, in installations where the oscillator or a low-level stage is keyed, it is necessary to disconnect the modulator so that the r.f. output tube may work at normal input.

The circuit shown in Fig. 1 shows how a single-pole three-position switch has been put to use

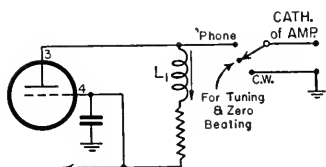


Fig. 1—Circuit diagram of the switching system described by W3PVY.

with the transmitter and modulator used here at W3PVY. Two of the switch positions provide for rapid change over from 'phone to c.w. operation, and the center or third contact allows the final to be disabled during zero-bearing or tuning adjustments.

To clarify the circuit of Fig. 1, it should be mentioned that all components other than  $S_1$  are parts of the modulator circuit appearing on page 15 of September, 1953, *QST*, and page 250 of the ARRL *Handbook*, 31st edition.

—Ed Rittenhouse, W3PVY

### CONVERTING FILAMENT TRANSFORMERS FOR PLATE-SUPPLY USE

IN searching for miniature power transformers for such low-power items as grid-dip oscillators, etc., I have found it convenient to make my own, using small filament transformers. Since most of these have the low-voltage winding wound on the outside, it is a easy to remove the few filament turns to make room for the rewinding.

The procedure is simple. Count the turns removed to determine the turns per volt ratio for the core. Now rewind the filament turns with a smaller size wire. Follow this with the "high-voltage" winding using the number of turns per volt previously determined. The wire sizes should be chosen so the  $I^2R$  losses in the two secondaries

under load do not exceed the rated  $I^2R$  loss for the removed turns. This allowable loss is fairly flexible and can be exceeded by 50 per cent or so for intermittent duty or where some ventilation is present.

—Ben Vester, W3TLN

[EDITOR'S NOTE: Additional data pertaining to the re-winding of transformers will be found in Chapter 7 of *The Radio Amateur's Handbook*.]

### IMPROVED AUDIO CIRCUIT FOR THE 50-MC. C.D. UNIT

ALTHOUGH the circuit to be presented is intended primarily for use with the 50-Mc. unit described in May, 1952, *QST*, it deserves consideration by anyone embarked on a speech-amplifier project designed with carbon-microphone input in mind.

The new circuit, shown in Fig. 2, uses a 6U8 triode-pentode as a replacement for the 12AT7 originally employed in the microphone input and the amplifier-clipper stages of the c.d. unit. Not only does the revised arrangement retain all of the desirable features discussed in the original constructional article, but it increases the gain of the speech amplifier by 10 db. or more. This represents an improvement over the 12AT7 line-up and eliminates the need for crowding the microphone so that full modulation may be obtained.

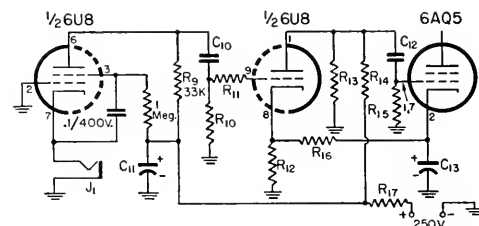


Fig. 2—Schematic diagram of the revised audio circuit for W1CTW's 50-Mc. c.d. unit.

In Fig. 2, the pentode section of the 6U8 is used as the microphone coupling tube and the triode section is employed as the voltage amplifier and clipper. The schematic shows that a 0.1-megohm screen dropping resistor and a 0.1- $\mu$ f. screen-to-cathode capacitor have been added to the circuit and that the plate resistor for the input stage has been increased to 33,000 ohms. It should be pointed out at this time that the values of the plate and the screen resistors are quite critical from the standpoint of maximum obtainable gain. Further study of Fig. 2 shows that the component values and the wiring origi-

(Continued on page 140)

# You Can't Beat F.M.!

## Advantages of "Almost-N.F.M." for V.H.F., with Practical Application in a 48-54 Mc. Exciter

BY DON H. GROSS,\* W3QVC

SOME of the brethren may think me a bit daft for saying so, but for v.h.f. voice work nothing excels the right kind of f.m. Perhaps a few hardy souls will want to venture through the technical difficulties of single sideband on frequencies above 50 Mc., but aside from such a remarkable feat, a.m. is definitely inferior to f.m., if the latter is properly used. Go ahead and laugh, but please read on.

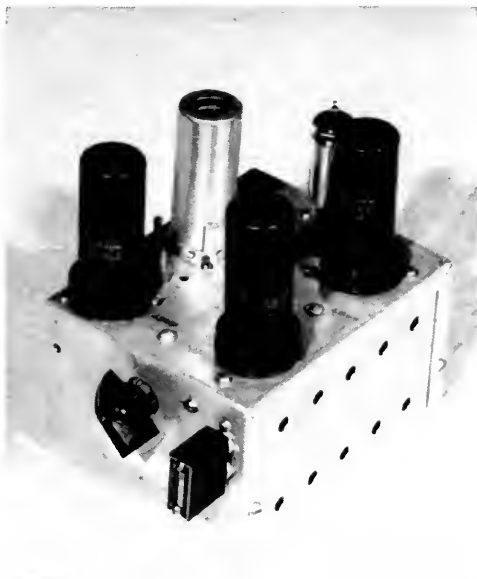
The word has gotten around pretty well that f.m. eliminates high-powered modulators, and that it is far better than a.m. when it comes to TVI or BCI. We can also see that the high grid drive and higher plate dissipation and voltage ratings necessary for a.m. make it difficult when we approach the u.h.f. region. Then, too, a 100 per cent modulated a.m. transmitter in the 420-Mc. band is limited to 12.5 watts antenna power (since 50 watts *peak* is the law), while up to 50 watts antenna power is legal with f.m. But we usually see a tendency to be apologetic about the communications value of f.m. This is mainly because most of our thinking since the war has been in terms of strictly narrow-band f.m., where second-order sidebands are kept insignificant so that our signals will occupy no wider channels than a.m.

In order to keep to true n.f.m., the modulation index must not exceed 0.6. Under these conditions, as the venerable *Handbook* says, "so far as effectiveness is concerned, a narrow-band f.m. or p.m. transmitter is about equivalent to a 100 per cent modulated a.m. transmitter operating at one-fourth the carrier power." At this rate, n.f.m. is enough to discourage any self-respecting DX man. Add to this the horrible method of detecting f.m. signals by slight detuning on an a.m. receiver, as nefariously practiced by most of us, and anyone with a brain in his head would conclude that if you want a signal without any vitamins, if you want your voice drowned in a waterfall of noise and clobbered with QRM, just use f.m.

### Whoa There!

However, dear friends, we have been overlooking a juicy item. Above 52.5 Mc. (and on some frequencies below) we aren't confined to the narrow-band version of f.m. What if we crank the audio gain up to give us a modulation

index of 1.0? Second-order sidebands appear, but they are still relatively weak.<sup>1</sup> The happy part is what happens to the first-order sidebands. Now they have some real zip. Put this signal through an i.f. amplifier of 6 or 7 kc. bandwidth,



The W3QVC f.m. exciter is a compact package. At the right front is the 6AC7 oscillator, with the modulator behind it. Left is the tripler, with the 5763 doubler in the back corner. The voltage-regulator tube is visible in back of the modulator. Note ventilation holes in the side of the bottom cover.

detect it with a good ratio detector or discriminator-following-a-limiter, and presto—f.m. comes into its own!

Rummage through the old *QST*s published just before the war and there you will see the beginnings of a development in amateur f.m. that was nipped in the bud at Pearl Harbor. Look, for instance, at that fascinating article by Murray Crosby on "Bandwidth and Readability in Frequency Modulation," page 26 of March, 1941, *QST*. There we see that for maximum readability of weak signals the deviation ratio should be 1.0, and that such an f.m. signal is always more readable than a.m. In fact, at some weak signal levels this "almost-n.f.m." signal is as readable as an equivalent 100 per cent modulated a.m. signal of *four times the power*. Thus the tables are turned. If it is transmitted and received properly, you can't beat f.m.

\* 1146 Prospect Road, Pittsburgh 27, Pa.

<sup>1</sup> In most locations there is not so much v.h.f. QRM that the extra bandwidth would matter much; and in any case heavily-modulated a.m. transmitters in the region above 144 Mc. are already using more space than f.m. with a deviation ratio of 1.0.



## How To Get Good F.M. Above 50 Mc.

Reactance-tube modulation of a self-excited oscillator just isn't stable enough for good narrow-band work on v.h.f. W1VLII has the right idea in his phase-modulation exciter.<sup>2</sup> A crystal oscillator provides the necessary stability. Reactance modulation of a tank circuit provides phase modulation. The only difference between a p.m. and an f.m. signal is that with p.m. the frequency deviation rises in proportion to the modulating audio frequency (assuming that the amplitude of the modulating wave is held constant), while with f.m. the deviation is the same for all audio frequencies. So the secret of turning p.m. into f.m. is to make the output of the speech amplifier vary in inverse proportion to the audio frequency. Only the r.f. section of an exciter is to be described here, but the speech amplifier that is used with it ends up with a 6SJ7 having an effective load resistance of 50K. A 0.006- $\mu$ f. condenser across this load gives the proper inverse frequency response. A clipper-filter circuit is also used, and this is most desirable.

### A Phase-Modulation Exciter

The exciter shown here is a straightforward, highly stable affair with sufficient output at 48-54 Mc. to drive an 832 tripler to 144 Mc. It uses single-control tuning, for compactness and simplicity of operation. Crystals for 8 to 9 Mc. plug in the front. Shielding, short wiring, and voltage regulation of the oscillator screen all serve to give excellent isolation of the grid-screen oscillator circuit from the phase-modulated plate tank, even though both operate at the same frequency.

The 6AG7 reactance modulator has enough gain and plate-current capacity to provide adequate deviation at 50 Mc., and more than enough for multiplication to higher frequencies. About two volts of audio (at normal voice frequencies) gives proper deviation for the 144-Mc. band. Some care has been taken in by-passing the

screen and cathode of the modulator, as well as in adjusting the grid to ground capacity, in order to eliminate v.h.f. parasitic oscillations.

The plate tank tuning range is determined by  $L_1$ ,  $C_1$ , and other circuit capacities across  $L_1$ . Tracking is accomplished through adjustment of  $L_2$ ,  $C_4$ ,  $L_3$ , and  $C_5$ . TVI is prevented by proper shielding and by-passing. An electrostatically shielded output link helps further in coupling out only the desired frequency. All tubes have protective cathode bias. Power supply requirements are 300 volts at about 125 ma., and 6.3 volts a.c. at 2.7 amp.

### Construction

The exciter is built in a  $3 \times 4 \times 5$ -inch aluminum box (Bud CU-3005 Minibox). Holes are drilled in the cover opposite the mica trimmers  $C_4$  and  $C_5$  to allow adjustment after assembly. They may then be covered with adhesive tape.

The crystal was at first mounted in the center, but had to be moved closer to the oscillator tube to achieve proper isolation from the rest of the circuit. A small aluminum shield partition is placed between the 6AG7 oscillator and the tuning condenser; the cathode by-pass condenser is placed so as to shield the plate contact on the tube socket from the grid; and  $RFC_1$  is small, with a short lead to the screen grid. All these precautions carefully isolate the crystal circuit, to achieve maximum stability.

A small-diameter octal socket allows the tripler tube to be mounted in its limited space. Don't dope the tripler plate coil until its circuit is aligned. Note that the center section of the tuning condenser is used for the oscillator plate; the front section for the tripler plate; and the rear section for the doubler plate. Insulated 'phone tip jacks are used for grid-circuit metering. The modulator screen by-pass in the photographed unit is a mica condenser; a disk ceramic condenser is specified because it is cheaper.

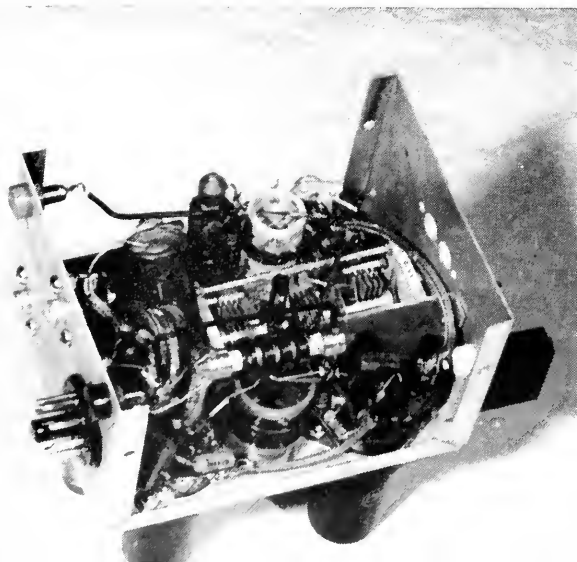
### Adjustment and Operation

The initial tune-up procedure is as follows:

- 1) Put the bottom cover on, but without its screws. Set  $C_4$  to minimum capacity. Plug in the highest frequency crystal to be used, and connect a high-impedance voltmeter between  $J_3$  and ground. Adjust the main tuning condenser for maximum negative voltage. This should be about 130 to 150 volts.

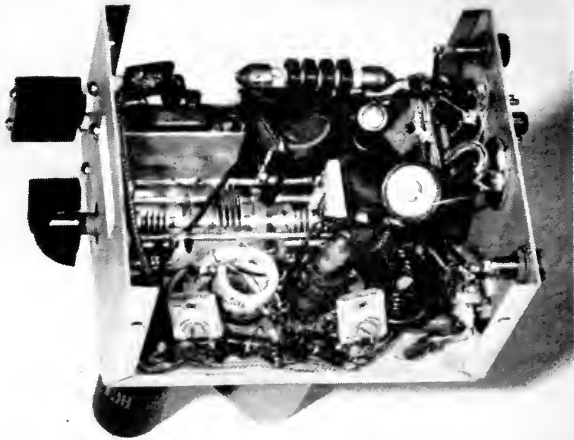
- 2) Change the meter to  $J_4$ , and tune  $C_4$  for maximum negative voltage, which should be around 70 to 90 volts.

Bottom view of the oscillator-modulator side of the f.m. exciter. Note the small shielded partition for isolating the crystal circuit. Two 'phone-type jacks are for audio input and r.f. output. Tip jacks are for measuring tripler and doubler grid voltages.



<sup>2</sup> Southworth, "A Phase-Modulation Exciter for the V.H.F. Man," *QST*, August, 1954.

Bottom view from the tripler-amplifier side. In the foreground are the tripler plate coil and the two mica tracking trimmers. The doubler tank coil is at the right.



3) Plug in the *lowest*-frequency crystal and tune the ganged condenser for maximum voltage at  $J_3$ .

4) Adjust the slug in  $L_2$  for maximum voltage at  $J_4$ .

5) Repeat Steps 1 through 4 until no further adjustments are necessary. The spacing of the turns of  $L_2$  may have to be changed if the slug does not give enough tuning range in the right direction. Remember that minimum inductance is with the slug all the way in. Inductance also decreases as the turns are spread apart. When you are sure the slug will properly align  $L_2$ , dope the turns in place.

6) Now for the output tank. With the *highest* frequency crystal, tune the ganged condenser for maximum voltage at  $J_3$ . Then tune  $C_5$  for maximum output.

7) Try the *lowest*-frequency crystal. Tune the ganged condenser for a maximum voltage at  $J_3$  again. Note which direction, if any,  $C_5$  must be tuned for maximum output. If you had to increase its capacity by tightening it, squeeze the turns of  $L_3$  together a bit; if you decreased  $C_5$ , spread  $L_3$  a little. You will have to remove the bottom cover to do this; be sure to replace it before checking alignment.

8) Repeat Steps 6 and 7 until no change in  $C_5$  is necessary for Step 7.

The exciter is now aligned. Screw on the bottom cover. After this, all you do is plug in the desired crystal and tune the knob for maximum output.

Frequency deviation is adjusted by controlling the output of your speech amplifier. The optimum adjustment is that which gives maximum output without appreciable distortion, at a moderate signal level, in a receiver with a 6- or 7-kc. i.f. bandwidth, equipped with a ratio detector or limiter-and-discriminator. The n.f.m. adapters advertised for a number of the standard commercial ham receivers fill the bill perfectly.

My thanks go to my good neighbor, Andrew B. Potter, for the photographs used in this article.

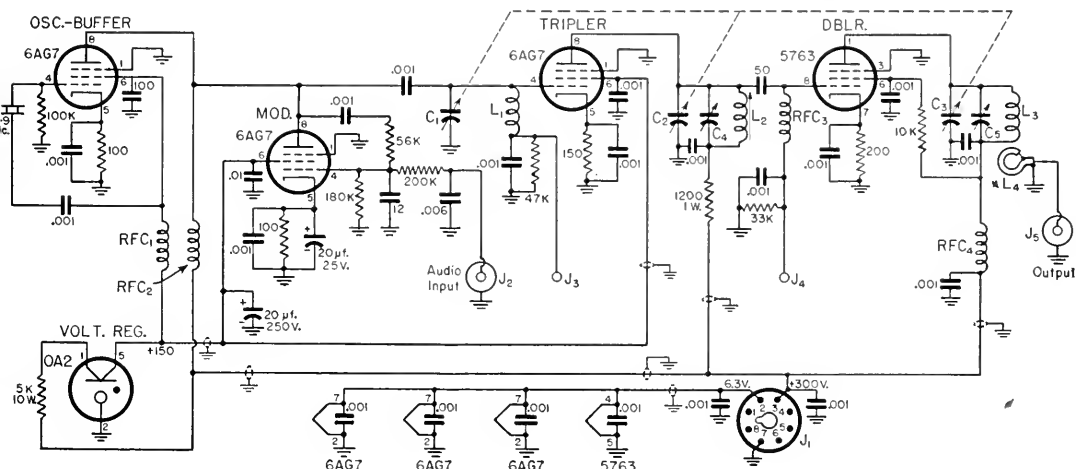


Fig. 1—Schematic diagram and parts information for the v.h.f. f.m. exciter. Capacitor values 0.001 and larger are in microfarads. All resistors  $\frac{1}{2}$  watt.

$C_1, C_2, C_3$ —3-gang variable, 25- $\mu$ f.-per-section (Bud LC-1847).

$C_4, C_5$ —3-30- $\mu$ f. mica trimmer.

$L_1$ —18 turns No. 20 enam., close-wound on 1-inch diam. form (National XR-2).

$L_2$ —5 $\frac{1}{2}$  turns No. 20 enam.,  $\frac{3}{8}$  inch long, wound on  $\frac{3}{4}$ -inch diam. brass-slug form (National XR-73).

$L_3$ —5 turns No. 12 enam.,  $\frac{1}{2}$ -inch diam.,  $\frac{3}{4}$  inch long.

$L_4$ —1 turn RG-58/U coaxial cable around cold end of  $L_3$ ; end of inner conductor soldered to outer

braid; end of outer braid left unconnected. Leave outer insulation on.

$J_1$ —8-pin male chassis fitting.

$J_2, J_5$ —Phono-type coaxial fitting.

$J_3, J_4$ —Phone-tip jack.

RFC<sub>1</sub>—50- $\mu$ h (National R-33).

RFC<sub>2</sub>—2.5-mh. (National R-100).

RFC<sub>3</sub>—1 mh. (National R-300).

RFC<sub>4</sub>—7  $\mu$ h. (Ohmite Z-50).

## • Recent Equipment —

### The 5100 Transmitter and 51SB Single-Sideband Generator

ANY amateur interested in a complete 'phone/c.w. transmitter in the 150-watt class, to which he can later add s.s.b. with a minimum of effort, will do well to consider the new Barker & Williamson 5100 Transmitter and its companion unit, the 51SB Single-Sideband Generator. When the two units are tied together, switching to c.w., a.m. or s.s.b., or any amateur band, 80 through 10 meters, is simple and quick.

#### *The 5100 Transmitter*

Designed for table-top operation, the 5100 is 22 inches wide, 11½ inches high and 14¾ inches deep. It weighs 83 pounds. The r.f. line-up consists of a 6BJ6 VFO (in the 160-meter band) followed by two 6BJ6 buffer stages. The second buffer stage is grid-block keyed, and serves as the crystal oscillator when crystal-controlled operation is demanded. The frequency-multiplication section of the transmitter uses up to four 6AQ5s, depending upon the multiplication requirement, and this entire section is broadbanded and consequently requires no tuning in operation. The output stage uses two 6146s in parallel, with a pi-network output circuit. A small variable condenser across the grid circuit of the output stage trims the circuit and serves as an excitation control. Recommended operation of the 6146s permits a power input of 135 watts on 'phone and 150 watts on c.w.

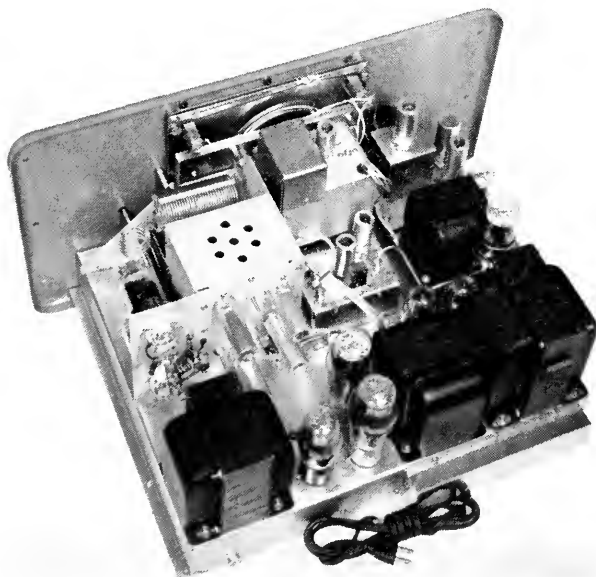
The audio section of the 5100 uses a 6U8 triode-pentode speech amplifier, 6AQ5 trans-

former-coupled driver, and a pair of 6146s for modulators.

A low-pass filter is included in the transmitter, which makes it mandatory that the transmitter work into the same load resistance (75 ohms) on all bands. All leads entering or leaving the package are filtered, as a further precaution against TVI. The manufacturer states that the low-pass filter has a minimum attenuation of 85 db. over the TV range, with over 100 db. at Channel 2. The instruction book devotes two pages to suggested antenna systems, apparently to allay any fears that working a transmitter into a given load resistance may represent an insurmountable obstacle. Actually, of course, it is the only way a transmitter with a built-in low-pass filter of this type can be operated, and it has the advantage that the pi-network circuit can be properly designed for the same *Q* on all bands.

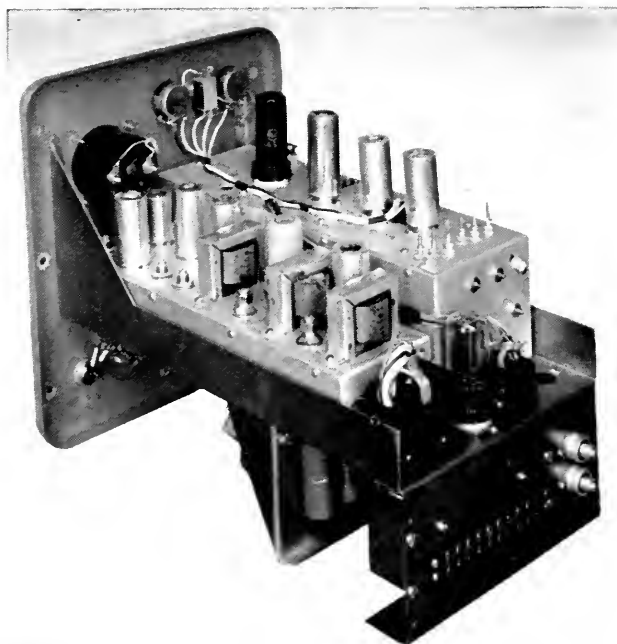
Two power supplies are included in the transmitter, a high-voltage one for the 6146s and a low-voltage one for the other stages and for bias voltages. A pair of 5R4GYs is used in the heavy supply and a 5V4G handles the job in the other supply. Two VR tubes take care of the regulation problems.

One bit of unusual circuitry can be found in the frequency-multiplier section where, for d.e., one pair of 6AQ5s is connected in series with the other pair of 6AQ5s across the 600-volt high-voltage supply. This is a good way to utilize a power supply to best advantage, but it is the



A top view of the 5100 Transmitter shows how the construction has been broken down into subassemblies. The r.f. output section can be seen at the left near the panel, while the 6146 modulators are at the right near the panel. The four tubes in the r.f. multiplier section are mounted horizontally.

This view of the 51SB Single-Sideband Generator shows the audio subassembly in the foreground and the r.f. section behind it. The audio phase-shift network is housed in the gray metal-tube envelope between two small transformers.



first time we have seen it in a piece of commercial gear. A similar dodge was used a few years ago in a mobile rig described in *QST*.<sup>1</sup>

For c.w. operation the screens of the output 6146s get their power from the low-voltage supply; on 'phone the screens are fed from the high-voltage supply through a dropping resistor, so that modulation is applied to both plates and screens. For tune-up on either 'phone or c.w., the voltage

of the big supply is reduced by dropping the line voltage through a resistor.

The owner of a 5100 doesn't have to give up the unit when going to higher power — terminals at the rear permit utilizing the audio power (up to 75 watts) to drive a larger modulator.

Looking at the 5100 from the operating stand-

<sup>1</sup> Harrington, "Ten-Meter Mobile With Remotely-Tuned VFO," *QST*, August, 1951.

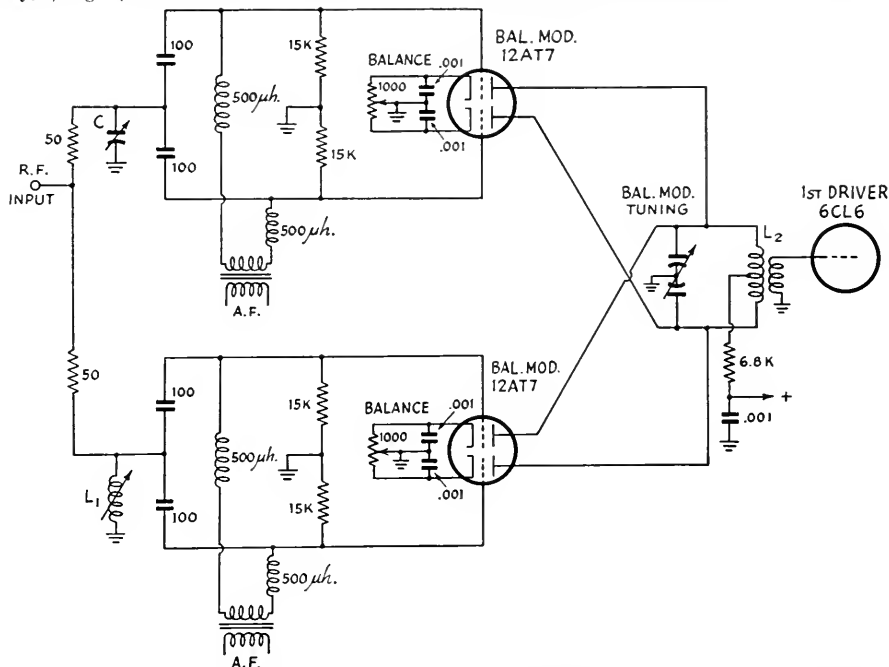
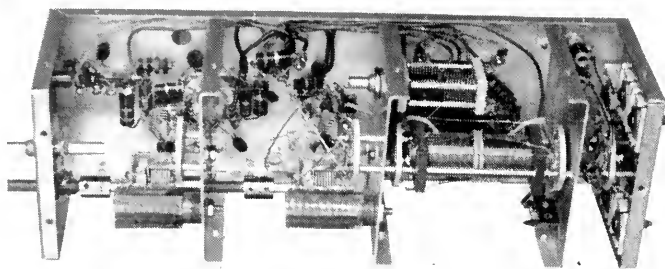


Fig. 1 — Simplified schematic of the balanced modulator circuit used in the 51SB. The r.f. phase shift is obtained by proper constants at  $L_1$  and  $C$ . In the actual unit, these constants are switched for each band change, as is  $L_2$ . Sideband selection is obtained by reversing the polarity of one of the audio channels. One cathode of each balanced modulator is opened for carrier unbalance when tuning the following r.f. stages.



The r.f. subassembly of the 51SB, with the bandswitch shaft and the balanced-modulator tuning shaft removed to permit better visibility of the parts. The compartments, from left to right, are 6V6 amplifier (the shield straddles the socket), 6CL6 amplifier, balanced modulators, and r.f. phase-shift networks.

point, the front panel carries the VFO knob (a large one), bandswitch, meter switch for measuring grid and plate current of the output stage and plate current of the modulator, a CW-VFO-PH switch for selecting the mode and for spotting frequency, and A.C., Tune-Operate and Plate switches. Once the band is selected, the operator has only to set the VFO and adjust the plate tuning and loading controls of the output stage, touching up the excitation control also, if necessary. The VFO frequency can be easily read on the slide-rule type scale.

### ***The 51SB Single-Sideband Generator***

The companion s.s.b. generator for the 5100 is a small  $10 \times 11\frac{1}{2} \times 14\frac{3}{4}$ -inch package that is placed to the right of the transmitter and tied in electrically with interconnecting cables and mechanically with bolts. Once it is properly connected to the 5100, it is a relatively simple matter to change from s.s.b. to a.m. or c.w. and back again.

The 51SB takes r.f. at the output frequency from the 5100 multiplier section and generates s.s.b. at the output frequency through audio and r.f. phase shifts. Fig. 1 shows a simplified schematic of the two balanced modulators. The audio section of the 51SB uses  $1\frac{1}{2}$  sections of 12AT7s in cascade before the audio is introduced into the audio phase-shift network. A 3500-cycle cut-off low-pass filter ahead of the network protects the network from audio frequencies beyond its range. From here the signal is amplified and then transformer-coupled into the two 12AT7 balanced modulators. The voice-controlled break-in and antitrip (for loudspeaker operation) circuits use 12AT7s and a 6AL5. The output of the balanced modulator is amplified through a 6CL6-6V6 chain to build up the amplitude to the point where it is sufficient to drive the pair of 6146s in the 5100 transmitter. Two tuning controls are included in the s.s.b. generator: the balanced-modulator output circuit and a ganged control for the 6CL6 and 6V6 plate circuits. The r.f. phase-shift networks are broadbanded and do not require adjustment. Consequently, the tune-up procedure of the 51SB is quite similar to the tune-up of any series of r.f. stages, and the operator does not have to be familiar with how s.s.b. works to put the rig on the air. A switched meter in the unit monitors the grid current of the 6146s and, by using a pair of germanium diodes, the output of the 6V6 driver. The r.f. output position

is used to set up the two carrier-balance panel controls.

The voice-operated control circuit closes a three-pole double-throw relay that provides a keying circuit for the transmitter, an antenna relay control circuit, and a receiver-silencing channel. Adjustable voice-control threshold and hold-in controls are available inside the unit, as is the antitrip sensitivity control. The unit can be used "push-to-talk" from a switch on the microphone or with full voice-controlled break-in, as desired.

Most of the panel controls have been mentioned, but in addition there is a carrier-unbalance switch (for tune-up), upper or lower sideband selector switch, bandswitch, tune-operate switch, and an audio gain control. In operation it is necessary, of course, to make sure that the bandswitches on the 51SB and the 5100 are set to the same band. A minor inconvenience, but nothing to worry anyone who has gone this far in equipping a complete station, is the necessity for changing microphone from unit to unit when going from s.s.b. to a m., but this could be solved by using two microphones or a shielded switch.

All of the power leads leaving or entering the 51SB are filtered, in keeping with the TVI precautions in the 5100. A 5Y3G in the power supply handles the plate-power requirements of the exciter.

### ***General***

In both the 5100 and 51SB, considerable use has been made of subassembly type construction. This is illustrated in the accompanying photographs. The subassemblies are a production expedient, of course, but they also contribute to shielding within the unit.

Instruction books for both units are careful to give step-by-step instructions for all operations, and anyone who takes the time to read them should have no trouble.

Of special interest to home constructors of s.s.b. gear is the little audio phase-shift network used in the 51SB. It is similar to others on the market in that it provides a 90-degree shift over the 300-3000-cycle range, but this one is completely enclosed in a metal-tube envelope of the size used for a 6J5. Thus, plug-in convenience and good shielding are provided in a very small package. This unit, the B & W Model 350, is marketed separately.

— B. G.

## 260 Series Power-SWR Meters

THE newest additions to the MicroMatch line of instruments for measuring power and standing-wave ratio feature operating convenience: With these meters it is no longer necessary to reverse the r.f. input and output connections in making measurements of forward

line balances out the forward voltage and responds to the reflected voltage, which is rectified by  $CR_2$ . The voltmeter, a 0-200 microammeter with appropriate series resistors for several usable voltage ranges, can be connected to either circuit by means of the single-pole single-throw switch.

The two types of indicator units, Model 262 at left, 263 at right. The principal difference is in the switching arrangement used for measuring forward and reflected power and for changing the full-scale range.



and reflected power, as was the case with the original MicroMatch. The Models 261 and 263 each consist of essentially two MicroMatch bridges arranged back to back so that one reads the outgoing voltage continuously while the other monitors the reflected voltage.

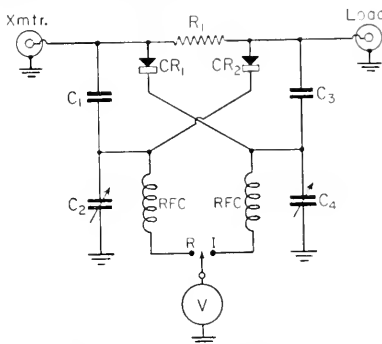


Fig. 1 — Basic circuit of the back-to-back bridges used in the Models 262 and 263 MicroMatches.

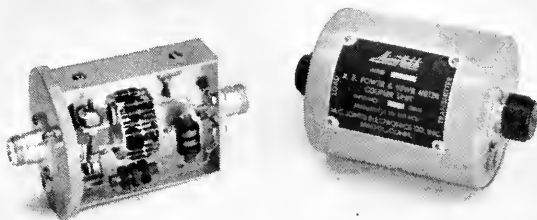
The basic circuit by which this is accomplished is shown in Fig. 1.  $R_1$  is the series resistance of the original MicroMatch circuit.  $CR_1$  is the voltmeter rectifier for reading the forward voltage. The bridge formed by  $R_1$ ,  $C_1$ ,  $C_2$  and the transmission

Both models consist of a "coupler unit" and an "indicator unit." The former contains the actual bridge and the latter the voltmeter and multipliers. The coupler units are identical in both models except for the line connectors; regular coax fittings are used on the 261 and "N" type fittings on the 263. The indicator unit for the Model 261 (it has a separate number, 262) uses a variable resistor as a multiplier, with calibration points for 10, 100 and 1000 watts full-scale reading marked on the resistor scale. The Model 263 indicator uses an individual factory-adjusted variable resistor for each of the same three ranges and selects them with a switch. The meter calibration is in watts and is the same on both indicators — 0-10, 0-100, and 0-1000 — and the same type of meter is used in both. The actual power delivered to a load is found by taking the difference between the forward and reflected power readings. The voltage standing-wave ratio is found by taking the ratio of the forward to reflected power and reading the corresponding v.s.w.r. in instruction book chart.

Either coupler can be left in the transmission line continuously, provided the power does not exceed one kilowatt with an s.w.r. of 1 to 1. The bridges are designed for 52-ohm lines.

The circuit of a measuring instrument is rarely

Internal construction of the coupler unit is shown by the view with the cover removed, at the left. The unit comes furnished with protective caps for the coax connectors as shown at the right. The units are designed for use with 52-ohm lines.



the whole story of its performance, as the sources of error are seldom obvious. The accuracy of a bridge of this type is almost entirely determined by the selection of components and the method of construction. The inside view of one of the coupler units shows the special constructional arrangement adopted to maintain accuracy over the frequency range from 3 to 225 Mc., and to pre-

vent the coupler from introducing an impedance "bump" in the line. The insertion loss is stated to be less than 0.1 db.

Couplers and indicators can be obtained separately. The instruction book with the coupler contains circuit information for home construction of an indicator unit, in case only the coupler is purchased. — G. G.

## The RME-100 Speech Clipper

THE advantage of speech clipping should be quite well known by this time. Modulation percentage is limited by the amplitude of the modulating wave form, rather than by average modulating power. The speech clipper increases the ratio of average modulating power to peak amplitude by clipping the peaks of the wave form. This increases the average percentage of modulation, improving the intelligibility without increasing the transmitter power. Since clipping introduces distortion in the form of harmonics, a filter for the harmonics follows the clipper.

The RME-100 consists of a two-stage preamplifier, using a 6SC7 dual triode, followed by a 6H6 clipper and a harmonic filter. Power supply is included in a unit measuring 5 by 6 by 7 inches.

The circuit is shown in Fig. 1. The unit is designed to be inserted between the microphone and the first stage of the speech amplifier, and a switch is provided for cutting the unit in or out of the circuit. The gain is limited to about 6 db. at the maximum clipping level so that a minimum of readjustment of the speech-amplifier gain control is necessary when the clipper is switched in or out.

About 15 millivolts of audio is required to produce a full 24 db. of clipping. This is usually obtained from a crystal or dynamic microphone when talking normally with the microphone at a distance of about 3 inches. The clipping control

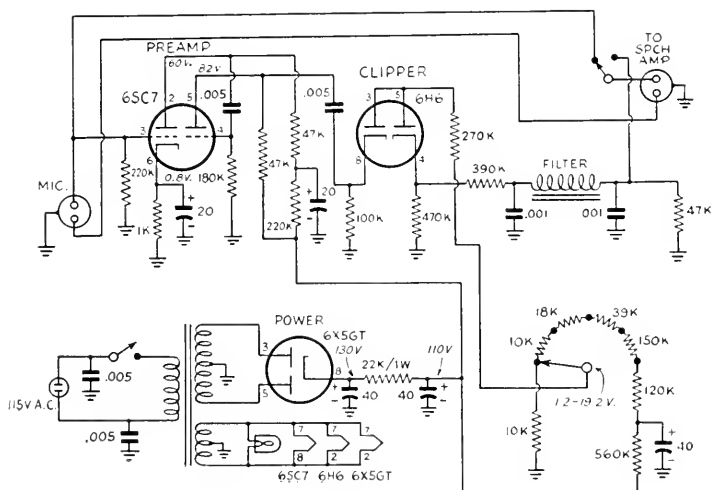
switch has 5 positions, 0 to 24 db. in steps of 6 db.

The clipper feeds into a low-pass filter, attenuating frequencies above 3000 cycles at the rate of about 20 db. per octave, and limiting the sideband width. At the low-frequency end, the amplifier has a roll-off characteristic attenuating



The RME-100 Speech Clipper in its streamlined cabinet.

frequencies below 300 cycles. The output impedance is 47,000 ohms, and the input impedance of the stage into which the unit feeds should be a minimum of 100,000 ohms. Hum level is 40 db. below signal at average clipping level.—*D. M.*



*Fig. 1* — Circuit of the RME-100 speech clipper. All resistors  $\frac{1}{2}$  watt unless otherwise specified. All capacitances in  $\mu\text{f}$ .



## The P-500 Power Amplifier

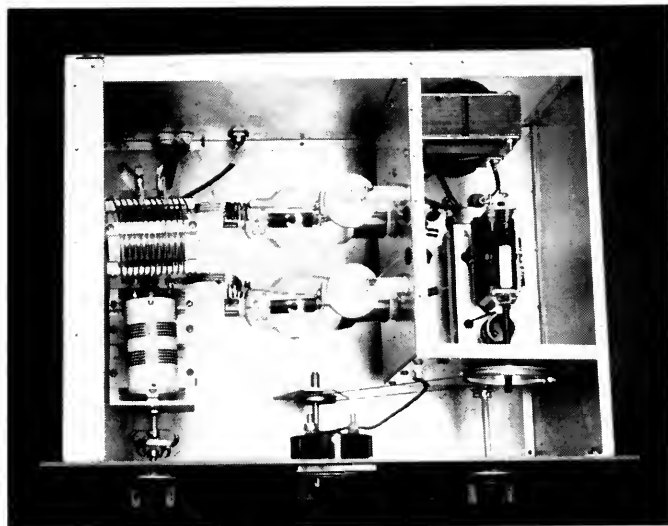
THE Lakeshore Industries P-500 power amplifier is another in the current crop of power amplifiers designed primarily to boost the power level of a single-sideband signal. It uses a pair of 5514 triodes in push-pull, with multiband tuners<sup>1</sup> in the grid and plate circuits to cover the amateur bands from 80 to 10 meters. As a consequence, there is no bandswitch of any kind, and the panel has two dials, for the grid and plate tuners, and a knob for controlling the

and the bias supply are at the rear of the chassis, as are the connectors for r.f. input and output. The bias supply to be used will, of course, depend upon the plate voltage available. The factory recommendation is a plate supply of 1000 to 1250 volts. The output terminals provide for connection to either balanced or coaxial line.

Circuitwise, the P-500 is similar to any other neutralized push-pull triode amplifier, except perhaps for the use of tapped parasitic r.f. chokes

The Lakeshore Industries P-500 power amplifier uses a pair of 5514 triodes mounted horizontally. Multiband tuners both in grid and plate circuits eliminate the need for a bandswitch. Normally, the grid-circuit compartment is covered by an aluminum plate.

The construction of this unit is interesting in that no normal "chassis" is used. The grid compartment is a box within the larger box that makes up the unit. A cane-metal top covers the box shown here, and the whole unit then fits into a painted cabinet.



grid-circuit coupling. A 0-500 milliammeter on the panel is connected in the filament return to ground and reads the total of grid and plate currents.

The line cord coming out the rear of the cabinet connects to the filament transformer—terminals for connecting to the plate supply

in the plate leads and 56-ohm resistors in series with the neutralizing condensers. (A number of triode amplifiers used as linears seem to require these resistors; e.g., the 811-A amplifier described in March, 1951, *QST*.) Loaded parasitic-suppression chokes are also used in the grid circuit, together with a 2700-ohm swamping resistor for better driver loading.

—B. G.

<sup>1</sup> King, "No Turrets — Just Tune!," *QST*, March, 1948; Johnson, "Multiband Tuning Circuits," *QST*, July, 1951.



# M. A. R. S.



### Operational Readiness Vital to Successful Disaster Work

Operational readiness is the key to success in disaster communications service and for public service operations where the time element is important. Two recent examples of alertness and operational readiness follow:

In the first instance, an earthquake rocked the Fortuna, Calif., area at 1956Z hours on 22 December 1954, causing extensive property damage. T. V. Conroy, A6GQY, of Fortuna immediately established an emergency link with Sixth Army Headquarters and with the Civil Defense

Coordinator for Region One, Col. T. Monroe. The circuit was in operation at 2004Z, just eight minutes after the initial shock. Communication was maintained continuously until 0215Z on the 23rd when it was officially determined that services of the Sixth Army Engineers would not be required. A6GQY reports that circuit discipline on 4020 and 4025 kc. was excellent.

Five days earlier, on 17 December 1954, a radio link was set up between Clovis (N.M.) Air Force Base and Goose Bay, Labrador, to provide medical information concerning an airman who had been bitten by a rabid dog. Stations A5HJF and AA5WSP were instrumental in this operation. A relay was established between Goose Bay Dispensary and the Clovis Air Force Base Hospital so that additional information could be transmitted. The Air Force MARS emergency frequency of 3838 kc. was used.



# Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

## GOLDEN NETWORK

Granite City, Ill.

Editor, *QST*:

The hams in this area did a wonderful job of collecting pledges during the 38-hour telethon for the benefit of Cerebral Palsy victims. The entire St. Louis, East St. Louis, Granite City, Madison, Venice, Alton area was blanketed by mobile operators who gathered in the gold as it was pledged via land line to several hundred operators at the Keil Auditorium Cerebral Palsy headquarters. About \$50,000 was pledged and picked up by the mobile hams. W9QDF was the spark plug who mustered the hams into the drive and created an efficient mobile pick-up network, but just about every operator in the area deserves credit for having given of his time to make the drive the success that it was. Hundreds of fixed stations were involved, all controlled by W9AIU, the Egyptian Radio Club Headquarters.

— *Egyptian Radio Club, Inc., W9AIU*

## 21-MC. VIOLATIONS

Pleasant Street  
Rochdale, Mass.

Editor, *QST*:

Several times while operating 21-Mc. 'phone there have been more W stations in the foreign 'phone section than there has been DX.

This may be attributable to the fact that the band is fairly new or that the majority of receivers do not have too accurate frequency markings, or none at all for the band. Of course, there is also the possibility that some Ws do not know the limitations of the American 'phone band on 21 Mc. So, I would recommend that in the near future a listing be made of 21 Mc. showing the frequency restrictions and pointing out the band limits. I hope this note will possibly save someone from receiving a "pink" ticket for out-of-band operation.

— *Kenneth Schofield, W1RIL*

[EDITOR'S NOTE — As shown again in "Happenings" this month, the voice segment is 21,250–21,450 kc.]

## NOVICE CHANGE

331 Forest Drive, S.E.  
Cedar Rapids, Iowa

Editor, *QST*:

I should like to hear some discussion on proposing a change in Novice regulations to extend the term to "one year or to the 13th birthday." I think the younger guys and gals should be given a break. What do you say gang?

— *R. Ray Weeks, W0LPK*

## FOR THE BIRDS

Hobbs, N. Mex.

Editor, *QST*:

I think it's about time I had my say about one of my pet gripes: c.w. in the 'phone bands. This is for the birds! I'll admit c.w. was here first, and it undoubtedly has its place in ham radio, but I personally think it is a thing of the past.

I think the 'phone bands should be reserved for 'phone operation. After all, if c.w. operators are going to be allowed to have large portions of each band set aside for their exclusive use, with big keep-off signs posted to 'phone men, it is only fair that 'phone men should enjoy the same rights.

Any night you can hear c.w. and teletype all over the 75-meter 'phone band, while there are wide-open spots all over the c.w. portion.

I was enticed into ham radio by the reduced code-speed requirements of the Novice ticket, and now I am being booted out by the c.w. and Sloppy Splatter-Band operators. Don't misunderstand me; I like ham radio. I've learned enough radio since going on the air as an amateur to pass my commercial 'phone exam.

All I'm asking is fair treatment for all hams. If a man wants to operate c.w., that's his business, but if the FCC is going to let him have his run of 'phone bands, then let the 'phone men into the c.w. bands.

— *M. J. Clark, W5UWQ*

## IT'S FOR THEM

326 So. Walnut Street  
Cookeville, Tenn.

Editor, *QST*:

There has been quite a big blow for the past few years about putting both c.w. and s.s.b. off the air. Or at least off the 75-meter 'phone band. Both of these modes of transmission seem to bother the a.m. 'phone men. I think the principal reason for this is the fact that most of the a.m. 'phone men have forgotten what their b.f.o.'s are used for . . . if they ever knew. Anyway, they couldn't read c.w.

What I would like to know is this: Would it be possible to put a.m. 'phone (the kind with a carrier and two sidebands) off the air completely?

There is a good argument for this action. Both c.w. and s.s.b. rigs are much more economical to build and operate. They are both less likely to cause TVI. They both can be operated with greater spectrum economy.

In a 15-ke. segment, only one a.m. 'phone station can be operated without interference. (I have heard several of the kilowatt-give-or-take-a-hundred-watts rigs around here that are much broader than 15 kc.) But in the same 15-ke. segment, two s.s.b. stations and ten c.w. stations may be operated without cross-interference. This is figuring the s.s.b. stations as being 3000 cycles wide and the c.w. stations operating within 900 cycles of each other, which is entirely practicable.

I would like to hear from other hams and get their opinions on the proposal of outlawing a.m. 'phone. The time has come that we cannot waste any parts of our crowded amateur bands!

— *Al Brogdon, W4UWA*

R.F.D. No. 2  
Bradford, Ohio

Editor, *QST*:

A year or so ago, when s.s.b. began to be an issue, I was violently and openly opposed to any part of it. However, this past summer I had plenty of time to do some considering of the issue. After careful study and consideration of the subject, I had to admit that perhaps some of my personal and "technical" opinions didn't add up to the right answer — that is, what I wanted them to add up to. I went so far as to visit a s.s.b. station, and talked over the rig. It made sense. After some more study I bought an exciter, built an amplifier, with the purpose in mind of finding out for myself what s.s.b. had and didn't have to offer.

I found out some of the following things. The s.s.b. group of operators, by the somewhat more technical nature of their equipment, are trying to do a good job, and are forced by the criticisms of others in their group to radiate a reasonably good signal. The group is immediately critical of a bad

(Continued on page 142)

# Happenings of the Month

## NATIONAL AMATEUR RADIO WEEK

Senator Prescott Bush of Connecticut, joined by Senator William A. Purtell of Connecticut and Senator George A. Smathers of Florida, has again this year introduced into the Congress a Resolution (S. J. Res. 25) to designate one week in the month of June each year as National Amateur Radio Week. The text follows:

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States is authorized to designate one week in June of each year as National Amateur Radio Week, and to issue a proclamation inviting the people of the United States to observe the week with appropriate exercises to further and stimulate interest in amateur radio in the United States.*

The measure has been referred to the Judiciary Committee of the Senate. If passed by the Senate, the bill will then go to the House for similar action. We understand that the Federal Communications Commission has endorsed the bill this year, and this action is interpreted as affording the measure a better chance than last year, when a similar resolution died in Committee. It is the intention of the language, if adopted, to select each year the week ending with the annual ARRL Field Day tests.

In introducing the bill, Senator Bush addressed his colleagues on the Senate floor as follows:

Mr. President, radio amateurs in the United States have made invaluable contributions toward the advancement of radio. In times of emergency, local and national, they have performed essential services to the public by providing a network of communications linking agencies dealing with disasters.

Connecticut is especially conscious of the contribution to the general good made by these men and women, affectionately known as "hams," because the American Radio Relay League, their official organization, has its headquarters in our State, at West Hartford. . . .

The month of June was selected because during that month each year is held the American Radio Relay League's annual field day in which more than 7000 amateurs throughout the country set up portable and emergency-powered radio communications in remote areas and man the gear in shifts for 24-hour periods. The purpose is to demonstrate the skill of volunteer amateur radiomen in providing emergency communications service in the event of disaster — military, civil or natural.

The week of this event would be a most appropriate one for designation as National Amateur Radio Week.

At this point interested amateurs and club groups who would like to see such a "week" can help by writing brief letters to members of the Senate Judiciary Committee urging favorable action on the resolution; individuals and groups

in the states represented on the Committee can be most effective. The list of Senate members, who can be addressed simply at the U. S. Senate Office Bldg., Washington, D. C., is:

Arkansas — John L. McClellan  
Idaho — Herman Welker  
Illinois — Everett M. Dirksen  
Indiana — William E. Jenner  
Maryland — John Marshall Butler  
Mississippi — James O. Eastland  
Missouri — Thomas C. Hennings, jr.  
North Dakota — William Langer  
South Carolina — Olin D. Johnston  
Tennessee — Estes Kefauver  
Texas — Price Daniel  
Utah — Arthur V. Watkins  
West Virginia — Harley M. Kilgore  
Wisconsin — Alexander Wiley  
Wyoming — Joseph C. O'Mahoney

The League is of course filing a statement urging its adoption, in language similar to that shown on page 53 of May 1954 QST.

## F.C.C. REGION CHANGES

In January FCC completed the revision of its regional-office set-up by dropping the regional office at Detroit and redesignating supervisory responsibilities to the Chicago regional office in the case of the Detroit district office (No. 19) and to the New York regional office in the case of the Buffalo district office (No. 20). This action has no effect on amateur examination schedules, but is of interest to TVI committees in the Detroit and Buffalo districts since they will now have liaison with new regional offices.

The total of regional offices is now reduced to six, those at Houston and Anchorage, Alaska, having been closed last year.

## REEXAMINATION AMENDMENT

To clarify the eligibility of applicants for amateur licenses to take another examination after having failed one, FCC has modified the language of Sec. 12.49 of our rules. It now says:

*Eligibility for re-examination.* An applicant who fails examination for an amateur operator license may not take another examination for the same or a higher class amateur operator license within 30 days, except that this limitation shall not apply to an examination for a General Class license following an examination conducted by a volunteer examiner for a Novice, Technician or Conditional Class license.

The principal effect is to make it plain that failing applicants for Novice and Technician Class licenses, now all handled by mail, have the same privilege as those failing Conditional Class — i.e., to appear before an FCC examiner and take the General Class exam without waiting 30 days. In fact, they can go up the very next day if they wish.

(Continued on page 144)

# QST—Volume III

## Part I—Foreword to Sumner B. Young's (WØCO) Index†

VOLUME III was the first complete volume to be produced under the guidance of a full-time editor. Its twelve issues extended from August, 1919, to July, 1920. Much information lies between its covers; but to collect and to organize it is often very difficult.

By all odds, the most important story recorded in this volume was the development of amateur "tube" transmitters by a small group of experimentally-inclined and progressive amateurs; and it is a pity that the material in *QST* is of such nature that only a few of the individual participants can now be identified.

No large-scale shifting over to c.w. transmitters occurred, although some unsupported general statements published in the magazine may imply the contrary. Later, there was a quickening of interest in c.w., during the period covered by Volume IV; but the real rush came only after the results of the first successful "Transatlantics" had been announced, in January, 1922. See Volume V.

Back in the days covered by the two postwar issues of Volume II, there had been some signs of interest in c.w. methods of transmission, even before the Navy had lifted the "lid" on "sending."<sup>1</sup>

Volume III's first offering of information on the subject was an unsigned article called "More About V.T. Transmitters."<sup>2</sup> It showed a circuit "found quite satisfactory on some sets supplied

the government during the war," and specified the size of an antenna coil for 200-meter operation. A second circuit "developed by the Marconi Company especially for use with the Marconi-DeForest V.T., and said to give the best results for that tube of any circuit tested," was diagrammed.

An unusual feature of this article was a suggestion that c.w. sets be developed which would use the same tubes for transmitting and receiving; and a sketch showing a possible application of the idea was given. The author (whoever he was) added: "... We believe that the ideal c.w. set of the future will incorporate some such feature as this."<sup>2A</sup>

An announcement at 24, 30, September 1919, probably referring to the DeForest Telephone & Telegraph Company, read as follows:

We are promised that soon the amateur world will have a bulb transmitter complete, designed primarily as a radiophone but also an efficient c.w. telegraph, and at a reasonable price. It sounds almost too good to be true but we believe it can be done. This set is being developed by a prominent commercial company and should be announced soon.<sup>3</sup>

The "Liberty Number" (November 1919), under "Strays," carried this important call for information, at page 32:

Anybody working c.w. sets on 200 meters? We'd

† "QST—Volume I" appeared in October, 1954, *QST*, p. 40; "QST—Volume II" appeared in February, 1955, *QST*, p. 42.

<sup>1</sup> At 19, June 1919, J. O. Smith, traffic manager of the League, said that many stations were then installing, or planning to install, undamped transmitters; and he pointed out some of the great merits of these sets.

Warner's "Essentials of V.T. Transmitters" had appeared, at 3 to 6, July 1919.

An unsigned article called "On Resuming Transmitting," at 18 to 19, July 1919, had characterized v.t. transmission as "perhaps the most important development of wartime radio from our standpoint." [Italics by S. B. Y.]

<sup>2</sup> 22, 24, September 1919.

<sup>2A</sup> This suggestion was repeated, with approval, at 48, February 1920, in the article "Auto-Modulated C.W. Telegraphy."

<sup>3</sup> See the ad of the DeForest Radio Telephone & Telegraph Company, on the inside back cover of the November, 1919, issue. The set operated on 60-cycle 110-volt a.c.; and the "tested ranges" were stated as: "telephone 10 to 20 miles," and "telegraph 50 to 75 miles." The price was \$200.00, complete, including bulbs. The operating wave-

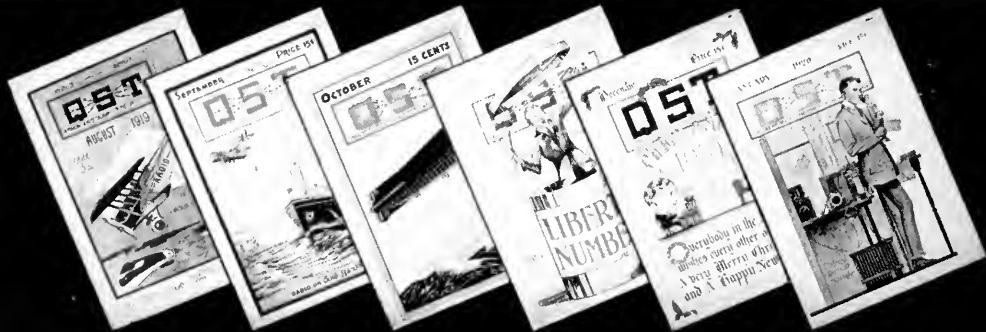
lengths were not stated. Rectifier-tubes were used to produce h.v. plate current.

<sup>4</sup> I can testify, from experience, that the early amateur c.w. transmitters simply would not work on wavelengths much below 300 meters.

See the "Editor's Note" appended to E. W. Whittier's article, "A Sure-Fire C.W. Circuit," at 29, July 1921 (Volume IV).

In a "C.W. Building-Contest," conducted by the Radio Club of Hartford, it was specified that the operating wavelength of the transmitters entered in the competition should not exceed 200 meters. Only two sets submitted would "get down" even as low as 200 meters. These were built by F. H. Schnell (1MO) and J. C. Randall (1ANQ). Both rigs would operate as low as 180 meters. See 24 to 25, September 1921 (Volume V).

At 13, November 1921, McMurdo Silver stated that it was then possible to operate an amateur transmitter, efficiently, below 200 meters (Volume V). At 63, January 1922 (Volume V), Kruse (in a letter) stated that c.w. transmitters could easily be operated below 200. At 50, February 1922 (Volume V), a "Stray" reported that 9ZT could "put out" one ampere of c.w. on 125 meters, but that he could find nobody who was equipped with a receiver tuning down that low.



be glad to have a description of any that are proving successful. We're afraid we're going to have lots of trouble with 200-meter undamped. The frequency is so high that an extremely precise adjustment of the heterodyne frequency must be made at the receiver.<sup>4</sup>

On the same page, right below this item, another Stray referred to the shortage of suitable transmitting tubes for amateur use:

The only power tube available for us seems to be the so-called Marconi tube, made by Moorhead and licensed by DeForest for the use of three electrodes. The Marconi Co. have enjoined DeForest from the manufacture of the Oscillon, on the grounds that it violates the Fleming patents. It takes rather a stretch of the imagination to see how this can be.<sup>5</sup>

A motor generator, designed to produce h.v. d.c. for plate circuits in tube transmitters, was first advertised in *QST* in the December, 1919, issue. The International Radio Telegraph Company, of 326 Broadway, New York City, offered a 100-watt unit (200 ma. at 500 volts) for \$75.00, f.o.b. factory.<sup>6</sup>

In any event, a small and diversified group of amateurs decided to pioneer in the tube-transmitter field. It is difficult to identify and to locate them, in most instances, from the pages of *QST*; but a few published items are of limited assistance.

<sup>5</sup> I can testify that a fairly active "black market" for various tubes developed around Greater Boston shortly after the "lid" was lifted on transmitting. "Western Electric" transmitting tubes, rated at 5 watts, could be had for around \$10.00 or \$15.00 apiece.

A "Stray," on page 32 of the November, 1919, issue, stated that the Marconi v.t. was a pretty good tube, however; and this paragraph cited the success achieved by a hurriedly-constructed transmitting set which had been installed aboard the U. S. S. *George Washington*. Using one Type "RH" Moorhead tube, that ship had worked Otter Cliffs, Maine (on c.w.), while 1200 miles out. The plate voltage was only 750. The wavelength used was not stated.

A "Stray" (at 24, December 1919) spoke of "salvaged" VT-2s for amateur c.w. transmitters. I am glad that some "salvaging" was done. A year or two would have been wasted, if "irregular" supplies of tubes had not been tapped.

<sup>6</sup> 54, December 1919. Also, see the "Stray" at 24, December 1919, which reads: "At last a cheap and good motor generator set for high-voltage d.c. has arrived. . . . Its lack heretofore has been the big drawback to amateur V.T. transmission. . . ." [Italics by S. B. Y.] For a scheme for converting "ceiling-fan" motors into h.v. d.c. generators, see "Strays," at 43, June 1920.

*Motor generators were considered an expensive item by most early hams. Also, the noise and vibration from them were annoying.*

Some of the biggest boosts later given to c.w. work were furnished by the development of other means of producing h.v. d.c. First came the electrolytic rectifier; and then came rectifier tubes, plus filter systems.

On the advent of the electrolytic rectifier, see: "An Electrolytic Rectifier for C.W.," by P. J. Furlong (1FF), at

At 34, February 1920, J. O. Smith declared:

. . . The short-wave c.w. set has arrived. There is no doubt but that the development of these short-wave c.w. sets will greatly add to the interest and welfare of amateur radio. A few of these sets are now in operation in the Atlantic Division. . . .

At 48, February 1920, it is recorded that 2AB (N. Y. City) worked 3ZH (Trenton, N. J.) on buzzer-modulated telegraphy, with 1.1 amperes in the antenna; and that 8DA (in Ohio) heard 2AB's signals "very QSA."

At 28, March 1920, Entwistle's Report identifies Stuart Briggs and Fred Bowditch (both of Brookline, Mass.) and Francis Pray (of Somerville, Mass.) as the owners and operators of "undamped transmitters."

The April, 1920, issue of *QST* contained an article (probably by Warner) entitled "The Advent of Amateur C.W." <sup>7</sup> This mentioned some of the "pioneers":

. . . 2ZV, Richmond Hill, L. I., is using a 340-meter wave for c.w. telegraphy, compensated wave 350 meters, with an antenna current of 6 amperes, representing 350 watts. The oscillating equipment is two Type P plotrons. This station should be good for 1500 miles.

. . . Others we know of are 2ZL, 2FS, 2AB, 2EX,

17 to 18, 28, February 1921 (Volume IV). For its later development, see: "A Symposium on Aluminum Electrolytic Rectifier Operation," edited by S. Kruse, at 20 to 25, June 1922 (Volume V).

On rectifier tubes, plus filters, see the following references. In Volume III: "Construction of a 500-Volt Rectifier Transformer for C.W. Work," by Robert Muns (2ACQ), and editorial note thereto appended, 17 to 19, June 1920. In Volume IV, see: 9, September 1920; and 36, November 1920 (Russell's report). Volume V references: 28 to 29, October 1921 ("S" Tubes, with smoothing filter); 25, April 1922 ("Rectifier Battle," at Third and Fourth District Convention); and 12, March 1922 (only three of the successful stations in the "Second Transatlantics" used tube-type rectifiers).

On h.v. synchronous rectifiers, see the following reference in Volume V: 18 to 19, June 1922 (editorial note). The synchronous rectifiers never achieved wide use.

At 49, November 1920 (Volume IV), Arthur K. Ransom, in a letter, expressed the opinion that the need for producing h.v. d.c. was the biggest obstacle to the widespread adoption of c.w. transmitters by amateurs.

<sup>7</sup> 13, 14, 16, April 1920.

Note that NSF, the Naval Radio Laboratory at Anacostia, Washington, D. C., is mentioned, in this same article (p. 13), as "testing bulb sets of various powers on 200 and 425 meters, using straight and chopped c.w."

Also note that some experimental work by the Glenn L. Martin Co., of Cleveland, is mentioned: ". . . One set puts 2.5 amperes in the antenna on 180 meters with 250 watts input, and the other set 4 amperes on 270 meters with an input of 350 watts. . . ." [Italics by S. B. Y.]

The Glenn L. Martin Co. stations used Air Service calls (UM and CMC). See 13, April 1920.



2ZM, SXK, 8YO, and 2XX. 2XX, ex-2XG, the station of Mr. Robert F. Gowen at Ossining, New York, has secured perhaps the best distance to date, signals being nightly QSA in Little Rock, Arkansas. Voice modulated and straight undamped are used.

... Probably the most interesting work is that done by 2ZL, the station of our traffic manager, Mr. J. O. Smith. *That the c.w. is proving up is attested by the fact that 2ZL is junking its spark set as outgrown.* The equipment consists of a few small oscillators in parallel, with an antenna current of 1.2 amperes, straight c.w. on 275 meters. ... Traffic has been put thru to Ohio and Massachusetts by this station when the spark signals were powerless to combat QRM and QRN.<sup>8</sup> ... [Italics by S. B. Y.]

J. O. Smith's "Operating Department Report" (at 28, April 1920) adds no more c.w. stations to the list, but makes this encouraging comment:

... Short-wave c.w. transmission has done much more than was expected of it, in that it has turned out to be a very docile, tame and willing worker, instead of a fly-by-night, unreliable, unsteady means of communication. More power to it. ...

At 34, January 1920, the "Calls Heard" list of L. E. Furrow (420 Lake St., Troy, Ohio) states that on December 8, 1919, he heard station DA and station 3ZH working one another, both on c.w. and on 'phone. *This is the first mention of v.t. transmissions by amateurs which I have been able to find in that particular department of QST.* DA was probably an unlicensed station.

The one-tube 20-watt c.w. transmitter of Mr. Carter, of Cleveland (call UM), is referred to in SDA's list of "Calls Heard" at 42, March 1920. The call UM appears also to have been used by the Glenn L. Martin Aircraft Co., at Cleveland; and it is said to have been an old Air Service call. See 13, April 1920, and the editorial note to the letter from H. V. Simmons, at 54, July 1920. However, it may well be that Mr. Carter's station, signing the call UM, was an unlicensed station. SDA (at Salem, Ohio, 60 miles away), stated that he worked UM regularly.

Don Mix (1TS, of Bristol, Conn.), whose "Calls Heard" lists eventually earned him the nickname of "Sleepless Wonder," reported hearing several stations on 'phone and modulated

telegraphy. See his list at 51, April 1920.<sup>9</sup>

The May (1920) issue of the magazine contained another leading article (unsigned) entitled: "An Experimental C.W. Transmitter."<sup>10</sup> It featured the Colpitts circuit, described as "a little complex, but beautiful in principle."<sup>11</sup> For amateur use, Western Electric VT-2s, General Electric VT-1s, and Class II Marconi bulbs were recommended.<sup>12</sup>

This May (1920) issue also contained a statement by J. O. Smith, at page 26, indicating that many amateurs desiring efficient transmitters had installed c.w. rigs. No statistics were given.

At page 31 of this same number, R. H. G. Mathews (9ZN) said that he was thinking of adding a  $\frac{1}{2}$ -kilowatt c.w. transmitter to his station during the coming summer or fall of 1920. This was real news, because in March (1920) 9ZN's spark, on 275 meters, had established a new record for amateur stations.<sup>13</sup>

The June (1920) issue carried an announcement that the Nola Radio Club (of New Orleans, Louisiana) was experimenting with radiophones and c.w. sets.<sup>14</sup>

At page 51 of the same issue, O. A. Gullledge (4AT), of Ft. Pierce, Florida, announced (by letter) that he had installed a DeForest "Oscillion" radiophone; and that he would send out "music, speech, and c.w. signals," at stated times, on 200 meters.

A well-written article, showing touches of true wit and humor besides, was published at 15 to 17, July 1920: "C.W. for the Amateur," by Howard L. Stanley (2FS).<sup>15</sup> He described a c.w., m.e.w., and 'phone transmitter which he had developed with the help of 2ZL (J. O. Smith).

More generalities appeared in Warner's editorial (called "C.W.") at page 24 of the July, 1920, issue:

Reports from all over the country show the gradual but sure trend from spark to undamped in amateur radio, just as we thought would develop, and we are glad to see it.

We are strongly in favor of c.w. and are going to do all we can to help it along. ...

We are on the eve of a great transition in amateur methods. We plead for the undamped the serious consideration that its many advantages merit.

<sup>8</sup> The final paragraph in this article (16, April 1920) contains this interesting language: "The Editor urges the adoption of c.w. by all serious experimenters as a field of highest interest and unlimited possibilities, but with the warning that they'll have to learn transmission all over, for the old dope of spark days will not apply. QST hopes in the near future to establish a special laboratory for c.w. experiments looking toward the development of sets particularly adapted to 200-meter relay work."

<sup>9</sup> He listed the following: 2XG ('phone and modulated telegraphy); 2XJ ('phone); 2XX ('phone and modulated telegraphy); 2ZL (spark and modulated telegraphy); 2ZY (spark and modulated telegraphy); SCO ('phone); and 8XU (spark and modulated telegraphy).

A few more early tube sets can be identified by referring to other lists of "Calls Heard," in later numbers of Volume III of QST.

At 44 to 45, July 1920, 1TS reported hearing 1AW on spark and 'phone; 2FS on spark and c.w.; 2XB on c.w. and 'phone; and 2XK on spark and modulated c.w.

At 46, July 1920, the Waverly (N. Y.) Radio Research Assn. reported hearing 2XA (on "Tel.").

SLF (Crafton, Penn.) reported hearing 8CB (on spark

and "Mod."), during May, 1920. His list is at 55, August, 1920.

The later list of the "Sleepless Wonder" (1TS), found at 55, August 1920, which records results obtained at Bristol, Conn., between May 18 and June 20, 1920, speaks of working 1AY, who used spark, Mod. c.w., and 'phone; and of hearing 2QR's spark, c.w., and 'phone signals.

Note that the Editor of QST had announced (at 48, February 1920) that he would be pleased to receive reports of amateur v.t. transmissions.

<sup>10</sup> 5 to 8, May 1920.

<sup>11</sup> 5, May 1920.

<sup>12</sup> 6, May 1920. The article added that only the Class II Marconi tubes were "now regularly available on the market for communication purposes."

<sup>13</sup> On March 9, 1920, 9ZN's 275-meter spark set was copied aboard a vessel lying in Colon, Panama. On March 12, 1920, the same ship heard him when 200 miles south of Balboa. See 8, May 1920. (Incidentally, the next day—March 13th—the vessel caught fire at sea and was destroyed. All hands were saved. See 8, May 1920.)

<sup>14</sup> 45, June 1920. The club is identified on 38, June 1920.

In the same issue, Traffic Manager J. O. Smith (2ZL) was equally vague as to how many stations were shifting over to tube sets, and where those stations were, although he said that a *trend* was developing:

... The long-heralded change from spark to continuous-wave transmission is now in full swing, and in quite a number of cases spark sets have already been discarded. . . .

Amateur radio is now in transition from spark to c.w., and a complete change-over is merely a question of time.<sup>16</sup> . . .

I wish I felt competent to make a fairly accurate estimate of how many amateurs were actively engaged in c.w. work, as of July 1, 1920, and concerning their geographical distribution; but I simply cannot do it. My best guess is, that as of that date, there were not over 200 v.t. transmitters in operation, in amateur stations, in the entire U. S. A.

This brings us to a study of the data published (in Volume III of *QST*) bearing on the number of licensed hams in the United States, and indicating their distribution throughout the nine Districts.

*The material is incomplete, and unanalyzed.* *QST* published lists of calls of new amateur stations, as follows: 42 to 43, November 1919; 10 to 14, December 1919; a separate supplement to the January, 1920, issue, containing 15 pages of call letters; 39 to 40, April 1920; 35 to 36, May 1920; 35 to 36, June 1920; and 41 to 42, July 1920. The January, 1920, supplement was a cumulative affair. Starting with it, and adding

further amateur calls published thereafter (and eliminating all calls published by way of correction), I get the following picture:

District	Total Licensed Amateur Stations Therein
First . . . . .	458
Second . . . . .	350
Third . . . . .	181
Ninth . . . . .	159
Eighth . . . . .	119
Sixth . . . . .	100
Fifth . . . . .	65
Seventh . . . . .	56
Fourth . . . . .	33
Total Licensed Amateur Stations in the 9 Districts . . . . .	1521

The main trouble with these data is that they give us no inkling of the dates as of which the various lists were accurate and complete.

Evidently, the Editor's idea was to devote two pages per issue to the publication of new calls, and to catch up as best he could, at this unchanging rate;<sup>17</sup> and I have now confirmed my suspicion that these lists were a good distance behind the actual march of events, as of (say) July 1, 1920. It is a pity that somebody like Edgar Felix did not get the correct and complete figures from government sources and analyze them for *QST*'s readers.

Mr. Entwistle presented some interesting facts re the number of licensed amateur stations in the First District in the June (1920) issue, at page 25. Just when he "put pen to paper" is not stated; but he said:

<sup>15</sup> Anybody who had the experience of working with one of the early "tube" sets will get a good laugh out of Stanley's description of his troubles.

Looking back at my log for July 21, 1920, I find that I first tried to operate a tube transmitter (built for me by the Atlantic Radio Co. of Boston, Mass.), on that date. All I accomplished was the burning-out of the plate-current meter, and the melting of the glass envelope on one of the four "VT-2" transmitting tubes.

After 1DH (E. W. Whittier, himself) had made some repairs, I got ½ amp. into my antenna, at Duxbury, Mass., on Saturday, August 7, 1920.

My first contact was a local — IRAA. I worked him on c.w. and buzzer-modulated c.w. on August 8, 1920. The "radiophone" part of my rig wouldn't work at all.

On Sunday, November 21, 1920, after more help from Whittier, and after I had moved my set back to Dorchester, Mass., I got 0.7 amp. into a big "cage" antenna, at my station (1AE), on 260 meters; and I worked 1PAI, and was heard by 1KAY, in Portland, Maine.

More changes, made mostly by 1DH (who worked for Atlantic Radio), followed. The first real traffic handling which I ever did, on c.w., was in the early hours of Sunday, December 26, 1920. Between 1:18 A.M. and 2:34 A.M., I sent 9 messages to 1TS (Bristol, Conn.), on 260 meters. 1ES kindly helped on the receiving work.

On January 27, 1921, I received written permission from H. C. Gawler, RI of the First District, to operate on c.w. at 325 meters, for 30 days, commencing February 15, 1921, to try to establish reliable communication with 2ZL. Some interesting results followed.

Mr. J. O. Smith (2ZL) really had a fine station. At 27, April 1921 (Volume IV), it was referred to as being probably the most powerful amateur c.w. station. See, also: editorial, "The Berries!" at 29, March 1921; and 48, May 1921. (Both in Volume IV.) Also, look at 13, April 1920; and 28, April 1920. (Both in Volume III.)

<sup>16</sup> 26, July 1920. The reports of the division managers

which follow Mr. Smith's general remarks (in that same issue) shed little light on the subject, either.

Entwistle (New England Division) made this statement (at 27, July 1920): ". . . One significant fact that stands out as inspiring is the gradual C-W-izing of New England. The following have c.w. sets: Wood, Arnold, Winchester; 1CK; 1XF, Providence; Mass. Radio School; 1YC; 1AY; 1QP."

The Northwestern Division Report (33, July 1920) includes these words by Acting-Manager Hertz: ". . . The tests conducted by 7CR, 7ZB and 7CW with the Forestry service radiotelephone sets have made us reluctant to hang up our 'phones. It is interesting to note that the c.w. radiating 0.46 ampere and spark signals radiating 1.5 to 2 amperes, both at Portland, are equal in audibility at 7CW, about 40 miles distant. . . ."

The Ontario Division Report (34, July 1920) states that there are presently four amateurs with c.w. sets in the City of Toronto, with others ready to build tube sets almost at once. The situation is described thus: ". . . A great transition seems to be taking place in the Toronto district. Everything seems to point to the fact that c.w. and radiotelephony are going to entirely replace spark telegraphy in this district with all advanced amateurs in the very near future. . . ."

The evidence, in other words, of an actual "shifting-over," was very indefinite, and very "thin."

Astute amateurs who had experienced the advantages of c.w. sets could confidently predict the end of spark transmitters; but nobody except a small group of "pioneers" had yet "gone over" to tube sets.

<sup>17</sup> See 39, April 1920: "Fellows, devoting a half dozen pages per issue to calls got to where it detracted from the reading value of *QST* and scared us. Then we hoped to publish monthly supplements carrying advertising to finance the thing, but the Post Office Dept. has just come out best in an argument on that. So we resume in *QST* — two pages a month until we get them all. You can cut out this sheet and keep it with the January supplement."



At the time of writing this report there are 1125 licensed amateur stations of the first and second class in the First Radio Inspection District with probably 90% of the total number of the former grade. Only one special amateur license has been issued, and that is located at Springfield, Mass. (Mr. Sabin). One additional school license has been issued, to Dartmouth College, call letters 1YB. The other technical school license was granted previously to the Rhode Island State College, call 1YA. Naturally the distribution of these stations varies from state to state and in different parts of the same state, *Greater Boston has the greatest density per capita; Wollaston, the most of any one city.* . . . [Italics by S. B. Y.]

Note that the number of licensed amateur stations in the First District alone, according to Mr. Entwistle, totaled 1125. His report probably was written sometime in May (1920), and possibly was written in April of that year. The time lag between the list of calls published in *QST* and the actual licensings of the stations themselves is strikingly illustrated, when this 1125 figure is compared to the 458 First District calls printed in *QST* up to and including the July (1920) issue, and when it is compared with the total of 1521 calls for the entire U. S. A., so published.<sup>18</sup>

It is interesting to see that the Fourth District still occupied the last position in total number of stations licensed.<sup>19</sup>

<sup>18</sup> Including the July (1920) list, at 41 to 42, July 1920, a grand total of 1521 U. S. A. calls and 58 Canadian calls had appeared in the *QST* lists.

The late Clinton B. DeSoto, at page 61 of *Two Hundred Meters and Down*, said: ". . . At the end of the fiscal year, June 30, 1920, the number of amateur stations had grown to 56 per cent of all stations licensed by the U. S. Government. The Department of Commerce reported that there were 5719 amateur stations, fifteen times as many as all other types of land stations put together. Although this was 370 fewer than in 1917 when all amateur stations were closed down, the disparagement was not due to decreased interest but to the fact that a number of amateurs were either still in the service or were fully occupied in commercial operating or manufacturing activities. . . ."

The best estimate which I was able to make, from the data in *QST* before I found this reference, was: 5000 amateurs as of July 1, 1920. I reached this by first multiplying 1521 by 2.45. (The "2.45" was obtained by dividing the First District "published" figure into Entwistle's First-District figure.) The multiplication gave 3726.45. To this, I added 1200 (my estimate of 2 months' new licensings), getting 4926.45. This I rounded off to 5000. Such are the "fruits" of incomplete figures.

<sup>19</sup> Look back at: 163, 185, July 1916; footnote 8, page 7, of my "Foreword to the Index to Volume I of *QST*"; 32, April 1917; and pages 11 to 12 of my "Foreword to the Index to Volume II of *QST*."

<sup>20</sup> The only amateur experimenters referred to, in *QST*, so far as I can see, were R. H. G. Mathews (9ZN), who was chief engineer of the Chicago Radio Laboratory, and some members of the Nola Radio Club, at New Orleans, La. See "The Underground Antenna Adapted to Amateur Waves," by Mathews, at 14 to 16, June 1920; and at 18 to 19, July 1920. The item re the Nola Radio Club is under "The Affiliated Clubs," at 45, June 1920.

The first reference to underground antennas for amateur use that I have found in *QST* appears in an advertisement of Chicago Radio Laboratory, at 41, August 1919. It points out the merits of an audio amplifier. This ad states: "Static elimination by use of the Rogers underground antennae is perhaps the most striking and far-reaching discovery made during the war. By this system 'static' is absolutely elimi-

As more and more stations came onto the air, the QRM problem became acute, especially around the larger cities.

In addition to the suggestion that tube transmitters be used in place of the "good old" spark sets — an impossibility until such time as power tubes and other essentials should become generally available to amateurs, and until decent c.w. receivers should be produced — two technological approaches were recommended. One of them was the use of highly-directional *underground* receiving antennas; and the other was the use of wavelengths *below 200 meters*, by low-powered spark transmitters.

As to the use of underground antennas, the literature is scanty. It is certain that only a very few amateurs actually experimented in this field. The need for elaborate shielding of all leads to the underground wires, and the necessity for employing elaborately-shielded receivers, or completely-screened receiving rooms, offered serious practical drawbacks. However, a handful of amateurs made the effort. They found some refuge from static, and verified the fact that *at short wavelengths*, underground antennas exhibited marked *directional* properties.<sup>20</sup>

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Part II of W6CO's index to Volume III of *QST* will appear in our April issue. — Ed.

nated, the only atmospheric interference being due to ground strays. In cutting out the static, however, the signal strength on 200 meters is also reduced to about one-eighth of the value of the same signal on the ordinary antenna. In order to render ordinary signals readable on the underground antenna it is therefore necessary to use one or more steps of amplification. . . ."

Mathews had become acquainted with the work done by Rogers, and with the later experiments conducted by A. Hoyt Taylor (Lt. Commander, USNRF), through his (Mathews') association with the Great Lakes Radio Laboratory during World War One. See 30, November 1919. For Taylor's articles on short-wave and long-wave spark and undamped reception, with subterranean or submarine wires, see: "Short-Wave Reception and Transmission on Ground Wires (Subterranean and Submarine)", 7, *Proc. I.R.E.*, 337-361 (August, 1919); "Long-Wave Reception and the Elimination of Strays on Ground Wires (Subterranean and Submarine)", 7, *Proc. I.R.E.*, 559-583 (December, 1919); and "The Use of Ground Wires at Remote Control Stations," 8, *Proc. I.R.E.*, 171-190 (June, 1920). (The last of these 3 articles was written by Taylor and by A. Crossley, Lieut. (j.g.), USNRF.)

The best practical results had been obtained, in the Navy, in the reception of *long-wave* spark and undamped trans-Atlantic signals; and after April 7, 1918, all such reception, at the Belmar, N. J., station, had been conducted by the use of submarine wires, "balanced" against a "ground" wire, or against a loop antenna. See pages 570-572, Volume 7, *Proc. I.R.E.* (December, 1919).

Some success with the reception of ship-to-shore traffic on 600 meters had been demonstrated. See descriptions of "Remote-Control Stations" at Great Lakes, Hampton Roads, and New Orleans, at 175-189, 8, *Proc. I.R.E.* (June, 1920).

On the *transmitting* side, the best work had been between Great Lakes and Chicago, a distance of 36 miles. (See 7, *Proc. I.R.E.*, 360, August 1919). The first transmissions — about January, 1918 — had been on 340, 600, and 720 meters. (See 7, *Proc. I.R.E.*, 356). A few weeks later, 450 and 550 meters had been used. (See 7, *Proc. I.R.E.*, 357). At Chicago, Mr. A. L. Howard's receiving station had been utilized. (See 7, *Proc. I.R.E.*, 356).

# Strays

Recently W5TYM rounded up, from Hq. and other sources, background material for a ham radio story to be used in his company's house organ. There must have been some potent arguments there — John Wood of the public relations department is now WN5FLS!

— . . . —

On January 31st the Henry Radio Store, Butler, Mo., was broken into and the following equipment stolen: two Collins 75A-3s (serials 1573 and 1585), one Collins 32V-3 (serial 1489), one Elmac PMR-6A (serial 3096) and one Elmac PSR-12 (serial 554).

A reward will be paid by Robert Henry, owner of the store, to anyone giving information leading to the arrest and conviction of the person or persons participating in the crime. Compensation will also be made for the return of the equipment.

— . . . —

In recent measurements by the National Bureau of Standards the velocity of light has been redetermined. Using the molecular constants method, the new value obtained was  $299,792,000 \pm 6000$  meters per second; by the radio interferometer method, the new velocity value was  $299,795,100 \pm 3100$  meters per second.

— . . . —

We are saddened to report the passing of Theodore G. Deiler, Engineer-in-Charge of the FCC 8th Radio District. In 1919, Mr. Deiler began his career with the Radio Division of the Department of Commerce. While with that organization he became Supervisor of Radio at New Orleans, La. With the transfer of the Radio Division to the Federal Communications Commission, he was designated Inspector-in-Charge and later became Engineer-in-Charge.

Mr. Deiler was very well-known and respected in the radio industry and among amateurs. The thousands of commercial and amateur radio operators who were licensed under his supervision will mourn his passing.

Members of the Montreal Amateur Radio Club, sponsors of the 1954 W/VE Contest, attend presentation of trophies donated by Emerson Radio of Canada. The large cup is retained by the club; the miniature goes to Russ Wilson, VE6VK, winner of the contest. *Front row (l. to r.):* B. Halickman, VE2AKT; Ethel Pick, VE2HI; Alex Reid, VE2BE. ARRL Canadian Division director: R. Grant, VE2QQ, Emerson manager: H. Ward, VE2XZ, president of MARC; C. Lockhart, Emerson asst. manager; Gordy Webster, VE2BB, MARC contest chairman. *Back row:* R. W. Phillips, VE2EY; T. Lott, VE2AGF; D. Bromwich, VE2HY; J. Miller, VE2TA; H. Moray, VE2ZN.



There are many new amateurs in and around Davenport, Iowa, thanks to the Davenport Radio Club. W0HMM reports on a new series of classes sponsored by the DRAC incorporating the best training features of lectures, films, and experiments. After observing a few of the lectures, the faculty of St. Ambrose College volunteered full use of the college laboratory and projection rooms to the Davenport club, in recognition of their outstanding program.



Your club's educational program may be able to utilize the club code award shown. Any reasonable amount of these certificates will be forwarded to your group, for certifying both receiving and sending proficiency. The club code awards and a sample course outline can be obtained from the League's Communications Department.

— . . . —

Transient U. S. armed forces personnel in or near Southampton, England, are invited to attend meetings of the Southampton Group of the RSGB. The get-togethers take place on the first Saturday of each month at 1 Prospect Place, Southampton. Those interested should telephone either G3TR, 68839, or G3CCE, 22478.

# YL NEWS and VIEWS

BY ELEANOR WILSON,\* W1QON

AMONG our YLs there are some (too few, alas!) who are "dyed-in-the-wool" v.h.f. operators. They concentrate the bulk of their operating and experimenting on the higher frequencies — they do what they can to create activity and interest in the world above 50 Mc.

Liane Waite, W2FBZ, is another<sup>1</sup> YL who is so enthusiastic about v.h.f. operation that she is happy to do what she can to help swell the population in the upper segment of the ham bands. And, as W1HDQ has said, "this is the gal who has won several Northern New Jersey section awards in our v.h.f. contests, and has a few times posted the top score for the country."

In the Sept., 1953, V.H.F. Party, Liane followed in second place nationally another leading YL v.h.f. operator, W8BFQ. Referring to Margaret and Liane, W1HDQ wrote in *QST* for Jan., 1954: "... two topnotch v.h.f. YLs whose untiring efforts have earned them the respect of v.h.f. men everywhere." In the June, 1954, Party, Liane made the country's high score in the single-operator class.

Liane writes:

I have been licensed since 1951, starting in as a Novice. Unhappy with conditions on 80 c.w., I was instrumental in getting my husband (W2FBR) to build gear for 2-meter operation.

\*YL Editor, *QST*. Please send all contributions to W1QON's home address: 318 Fisher St., Walpole, Mass.

<sup>1</sup>See Apr., '53, department for information on other v.h.f. YLs.



W2FBZ

## COMING YL GET-TOGETHERS

April 23rd — W1 YLs, Sheraton Plaza Hotel, Boston. Write WITRE for details.  
May 20th-22nd — LARK Convention, W9 YLs, Allerton Hotel, Chicago. Write W9MYC.  
June 24th-27th — First YLRL International Convention, Hotel Miramar, Santa Monica, Calif. W6UHA, General Chairman.

We met a congenial group of local hams who were interested in higher frequencies, and I believe that, more than anything else, caused a continuation of interest in those bands, even after obtaining the General Class license. We became interested in contests, which I feel is one of the greatest ways for checking gear and promoting the building of new gear. Because of this, we got on 220 and 432 — at the same time we were on 6 and 2 meters. We are interested in 1215 and hope to be on that band by next spring.

There is quite a challenge to me in operating frequencies where it is possible to accomplish something that has not been done before. We are interested in carrying on any v.h.f. schedules which would be desirable to set up, and we have two goals. One of them is to work Florida on 2 meters; the other is to work England.

May Liane soon realize both goals, and may her words encourage more YLs to take to the higher frequencies.

## Reminder!

YLs and OMs — don't forget your date to meet in the Sixth Annual YL-OM Contest on March 5th-6th and 19th-20th. Complete details were on page 49, February *QST*.

And speaking of OMs — we are encouraged and perhaps a bit flattered to realize how much mail for his department comes from them. The proverbial "battle of the sexes" seems nonexistent in our hobby; rather, the spirit is one of mutual respect, enthusiasm, and cooperation. We're always pleased to hear from OM readers and hope that their interest in the distaff side will continue!

## Keeping Up with the Girls

W5TTU, YLRL 5th District chairman, reports the organization of the Texas YL Round-up Net which meets Thursdays at 0930 CST, 3880 kc. W5WXY, Bernice, is NCS with W5ZTB as alternate. Pat also observes that the Southern Belle Net has changed its meeting time to 0830 CST (3920 kc., Fridays). . . . New members K6s AYJ E1I, KN6s EXQ EXV GRA GQW IDL IHD, W6s HVC QGC QOO TMB bring the Los Angeles YLRC membership up to 55. For the club's annual Christmas party, W6QGX, Harriette, trimmed a tree with small pieces of radio components and topped it with a miniature 16-element 2-meter beam designed by KN6GMX, Jayne. At the January

(Continued on page 148)



WITRE, Barbara Harrington, of Topsfield, Mass., turned in the highest claimed "phone score in the Eastern Mass. section during the 1954 Sweepstakes. Licensed in 1951, Barbara has been on one band or another ever since. Currently she operates 10, 15, 20, 40 and 75, with 20 her favorite band. Holder of a "phone WAC certificate, she has worked 78 countries with 56 confirmed. She is alternate net control with W6UHA of the 20-meter YLRL net. A registered nurse, she is the XYL of W1JEL and the mother of two daughters, 5 and 7, both of whom are working at learning the code.



CONDUCTED BY EDWARD P. TILTON, WIHDQ

**A**LONG about the last week in January each year you can measure v.h.f. activity with a ruler — a ruler alongside the logs mailed in to Headquarters following the Annual V.H.F. Sweepstakes. Time was when a pile an inch high looked big for a v.h.f. contest. But you need the better part of a one-foot scale for the eighth running of this popular event, January 8th and 9th.

When you look through the comments accompanying the entries, you find things like "Never heard so many signals in my life" — "Activity here was at an all-time high" — "Had to peel the signals off in layers" — "New contacts were made right up to the last minute!" Nobody reported conditions as being good, but there seems little doubt that the 1955 event will break all previous records for v.h.f. contests.

At least a dozen participants reported more than 200 contacts each, K2CMB/2 leading with 248. W2TBD made 225 contacts on 144 Mc. alone. The country's top score, so far, is W2UK's 6336 points, made possible through the amazing total of 18 ARRL sections worked on 144 Mc.! Last year's record score of 3952 points, by W1RFU, was topped by at least 8 contestants, with W2RGV, W1UIZ/1 and W1RFU all over 5500 points.

Club records seemed sure to fall, though the big-club totals have not been checked as we write. The South Jersey Radio Association seem to have maintained their near-monopoly on V.H.F. SS gavel awards, their claimed total for 1955 running over the 50,000-point mark. Their perennial competitors, the York Road Radio Club, from just across the Delaware River, outdid their previous efforts, and it looks like a close one between these two rivals. Several smaller clubs posted totals that would have been good for top place a few years back, and the num-

ber of clubs participating was well up over previous years.

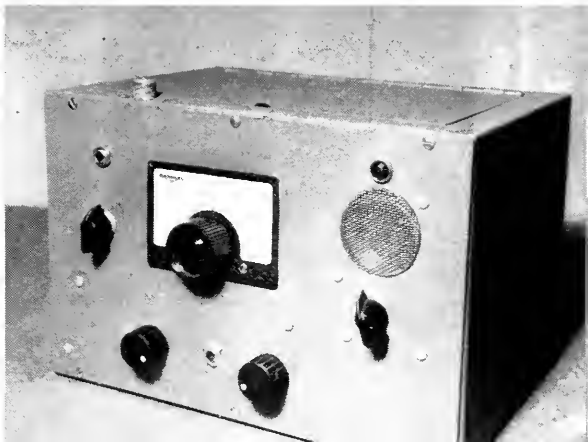
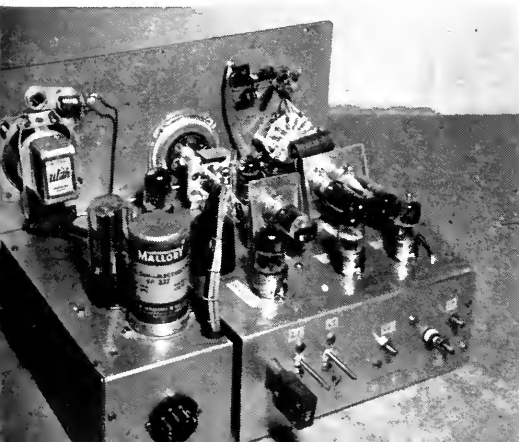
Propagation appeared close to the winter average, from your conductor's vantage point. This would have meant a quiet Sunday afternoon and evening in years past, as the field would have been pretty thoroughly covered by noon of the second day. But not in 1955. The 2-meter band, particularly, was jumping with activity, right down to the last minute. There was never an hour, including those just before dawn on Sunday morning, when it was not possible to make hay in this contest. In many areas you no longer post a winning total and get anything like a normal night's rest in a V.H.F. SS week end!

Through the Middle West many operators reported conditions the worst they'd seen all winter. Particularly west of the Mississippi, contacts were made only over short distances. But still we find reports coming in, in better than former numbers, from most of this territory. Far-western v.h.f. men, too, report the going rough, but there are some good W6 and W7 logs coming in, with the deadline for their mail still a few days away as we write.

There was heartening evidence of new v.h.f. activity in many quarters. They won't hit a high spot in the national scoring, because of their lack of point-building section multipliers, but the Albuquerque V.H.F. Club came through with 20 logs. A goodly number of reports came from North Carolina groups, whose principal complaint was that stations they should have been able to work in Virginia and farther north didn't turn their beams around to the south often enough.

Checking a contest of this magnitude is not done in an idle hour; it will be some time before the final results are known. But one thing is sure:

One of the more popular items of v.h.f. gear described in *QST* in the past year was the "One-Package 2-Meter Station" by W1VLI. In the April, 1954, issue. These pictures show an adaptation of the design by W2NGN, who followed the original closely circuitwise but modified the layout to fit a more commonly-available case.



The 8th V.H.F. Sweepstakes provided a week end of competition that will not soon be forgotten.

### Here and There on the V.H.F. Bands

More on the Sept. 18th fireball: In December QST, page 68, we reported strange doings on 144 Mc. that appeared to tie in with the appearance of a fireball in western skies the night of Sept. 18th. At that time we knew that W0TJF had heard W5VWU, and that several New Mexico stations had heard unidentified DX, apparently reflected from the region around the fiery visitor. In response to our request for information on any other reception of this sort, W0VEC, Lincoln, Nebr., sends us the following:

At about 2130 CST, W0VEC heard a c.w. station on 144 Mc. say, "— SO G A W?FAG DE W7VMP". Undoubtedly, the station being worked was W5FAG. At 2143, W5VWU was heard by W0VEC and called, following reception of his CQ. The signal had risen to a peak of S8 to 9, in a series of bouncing fades, and it faded out in the same way. The entire period of reception was about 30 seconds. The W7VMP signal was steadier, about S1.

The 2-meter reports from various parties appear to span a period of half an hour or more, yet reports of the fireball's appearance relate to only a few minutes, at the most. It appears possible that the reception reports resulted from a fairly general meteor shower, of which the fireball may have been merely one spectacular part. We suspect that quite a bit more of this sort of thing would be observed, if 2-meter activity were maintained regularly on the scale that prevails during a v.h.f. contest week end.

Here's a fellow who really has had antenna trouble! W4CVQ, Raleigh, N. C., had just put up 24 elements each for 220 and 144, when Ilurricane Ilael dropped a tree across his guy wires. All antennas, including a 6-meter beam, a "d.e.-band long wire," and the above, toppled 110 feet to the ground. Next, a 32-element 144-Mc. beam was erected, and seven days later a turkey flew into it. (Jake says the array looked as if the invader was a bomber!) The latest in the line of 2-meter beams is a 24-element, W2NLY-style collinear, horizontal. It works out better than the 32-element for Jake's requirements, as it is less critical as to direction.

This can be important in an area where much searching of the band is required, and this certainly applies to North Carolina, though things are looking up there on 2. The V.H.F. SS file contains quite a batch of logs from North Carolina entrants, for the first time. Several of the boys complain that they couldn't work out of the state because the stations to the north didn't turn their beams down that way often enough.

W4CVQ is another of those fellows who is working miracles with 826s. His pair run very easily at 500 watts input on voice, and have been pushed to 800 watts input without undue heating.

W4DWU, Falls Church, Va., thinks that all 2-meter men must use old call books. He was formerly located in St. Petersburg, Fla., and he still has to spend quite a bit of time disillusioning excited 2-meter ops who think they have just snagged a Florida station.

How consistent is communication over a 450-mile path on 144 Mc.? Some idea can be gained from results between W8BFQ and W1HDQ. Both stations have good locations, but the terrain in between is very rough, all the way. In the period between October 25th and the end of the year, a schedule kept at 1715 EST produced identifiable signals each way on 24 tries. This figures out to quite a bit better than half the time, when equipment troubles and inability of one or the other to keep the skeds are included. Tests consisted of only two minutes of transmission each way. Experience the previous winter, and through last spring, indicated that when 5-minute transmissions were made by W8BFQ, at least some recognizable signal could be heard by your conductor just about *every* try. Similar results, or better, have been achieved in nearly all parts of the country, and over paths that appear even more formidable than the one between West Richfield, Ohio, and Canton, Conn.

There is increasing interest in extended-range tests in many quarters, as word gets around that hops of several hundred miles can be worked regularly on 144 Mc.—if sufficiently good equipment and antennas are used. W5FAG, Albuquerque, N. Mex., is making nightly tests with W6WSQ, W6NIZ, and W7LEE at 2200 MST. Hub has a low-noise converter and a selective i.f. system. His antenna

### 2-METER STANDINGS

Call			Call				
States	Areas	Miles	States	Areas	Miles		
W1RFU	19	7	1150	W6WSQ	3	3	1390
W1HDQ	19	6	1020	W6BAZ	3	2	320
W1CCH	17	5	670	W6NIZ	3	2	360
W1EZN	16	6	750	W6AIMU	3	2	240
W1EEO	16	5	475	W6GCG	2	2	210
W1UIZ	15	6	680	W6QAC	2	2	200
W1AZK	14	5	650	W6EXH	2	2	193
W1MNF	14	5	600				
W1BCN	14	5	650	W7VMP	4	3	417
W1KCS	14	5	540	W7JUC	4	3	247
W1DJN	13	5	520	W7LEE	3	3	240
W1MMX	10	5	520	W7YZU	3	3	240
				W7JUC	2	2	140
				W7RAP	2	1	165
W2OR1	23	8	1000				
W2UK	23	7	1075	W8BFQ	29	8	850
W2NLY	23	7	1050	W8WXY	28	8	1200
W2AZL	21	7	1050	W8WJC	25	8	775
W2QED	21	7	1020	W8RNH	22	8	690
W2BLV	19	7	910	W8DX	22	7	675
W2OPQ	19	6		W8WRN	20	8	670
W2DWJ	17	5	632	W8BAX	22	8	685
W2AOC	17	5	600	W8JWV	18	8	850
W2TII	16	7	880	W8EP	18	7	800
W2PAU	16	6	740	W8RWW	17	7	630
W2PCQ	16	5	650	W8WSE	16	7	830
W2LHI	16	5	550	W8SKW	16	7	700
W2CFT	15	5	525	W8SRW	16	7	700
W2DFV	15	5					
W2AMJ	15	5	550	W9EHN	23	7	725
W2QNZ	14	5	400	W9FVJ	22	8	850
W2BRV	14	5	590	W9EQC	22	8	820
				W9KLR	21	7	690
W3RUE	23	8	950	W9BYP	20	7	1000
W3KML	19	7	660	W9UCI	20	7	750
W3IBH	19	7	570	W9KPS	19	7	640
W3BNC	18	7	750	W9MUD	19	7	610
W3FPI	18	7		W9REM	19	6	
W3TDF	17	6	720	W9LDF	19		
W3KWL	16	7	720	W9ALU	18	7	800
W3GSA	16	7	720	W9GCA	17	6	720
W3TDF	16	5	570	W9WOK	17	6	600
W3GKP	15	6	800	W9ZHL	17	6	
				W9MBI	16	7	660
W4HHK	26	8	1020	W9BOV	15	6	
W4AO	22	7	950	W9LEE	15	6	780
W4CFT	20	8		W9JED	15	6	760
W4JFV	18	7	830	W9JNZ	14	6	560
W4NJK	16	7	665	W9DDG	14	6	700
W4UMF	15	6	600	W9FAN	14	7	680
W4OKM	14	7	500	W9QKM	14	6	620
W4JHC	14	5	720	W9GAB	14	6	370
W4WCB	14	5	740	W9GAP	12	7	540
W4TCR	14	5	720	W9ZAD	11	5	700
W4UBY	14	5	435	W9GTA	11	5	540
W4IKZ	13	5	720	W9JBF	10	5	760
W4JFU	13	5	720				
W4ZBU	10	5	800	W0EMS	27	8	1175
W4UDQ	10	5	850	W0HID	24	7	870
W4DWU	8	6	625	W0GUD	22	7	1065
W4TLA	7	4	850	W0ONQ	17	6	1090
				W0INI	14	6	830
				W0OAC	14	5	725
W5RCI	21	7	925	W0TJF	13	4	
W5TJ1	19	7	1000	W0ZJB	12	7	1097
W5QNL	10	5	1400	W0WGX	11	5	760
W5CVW	10	5	1180				
W5AJG	10	4	1260	VE3AIB	20	8	890
W5MWW	9	4	570	VE3DR	18	7	790
W5ML	9	3	700	VE3BQ	14	7	790
W5ABN	9	3	780	VE3DER	13	7	800
W5ERD	8	3	570	VE3BPB	12	6	715
W5VX	7	4		VE2AOK	12	5	550
W5VY	7	3	1200	VE3AGG	11	7	800
W5FEK	7	2	350	VE1QY	11	4	900
W5ONS	7	2	950	VE77J	2	1	365
W6ZL	3	3	1400				

is a 16-element array, but a 64-element job is nearing completion, as is a 1-kw. final stage. Activity and equipment on 432 Mc. are improving, also. W5S NSJ EDK FJE and FAG all have crystal-controlled gear and low-noise converters on that band, too.

W5VWU, formerly of Albuquerque, has moved to Florida, taking with him a 1-kw. final and all the other gear needed to do outstanding work on 144 Mc. We may get that Florida activity yet — if John doesn't let that climate get him down too soon. Another prospect for 2-meter DX tests: W7LHL, Seattle, Wash., is making a winter project of the construction of a high-powered final stage and a big horizontal beam.

As 2-meter activity becomes more universal around the country, a closer tie-in between v.h.f. men and the ARRL field organization might well be made a major objective of SCMs and other ARRL officials. One way that this aim can be served is to arrange for more frequent and widespread transmission of ARRL Official Bulletins on the v.h.f. bands. W9USI, Wilmette, Ill., transmits bulletins on 144 Mc. as regularly as possible at 1930 CST nightly. He runs through

(Continued on page 144)



CONDUCTED BY ROD NEWKIRK,\* W9BRD/9

## Who:

Well, the first half of the 21st ARRL International DX Competition now is history. How're you doing? Hah, if you think *you* goofed, here follow some early and tragic DX Test flashes from around the country. For your 1955 All-American All-Call-Area All-Star DX Test line-up, Jeeves nominates:

W1 —, *Orson A. Roundlot*, whose imagination was working so well that every number he heard was meant for him. So far, best score he ever (thought he) made.

W2 —, *Zeke N. Peck*, an expert touch-typist, who kept his entire log on a mill but didn't notice the ribbon break during the first hour.

W3 —, *Watkins D. Matterby*, who spent the whole first Test week end tearing apart his factory-built kw. Then found it had stopped working because the XYL had kicked out the wall plug while dusting.

W4 —, *Warren N. Beetup*, whose beam rotator froze in the southeast quadrant as the Test began. Came out of the first week end with 638 KP4s.

W5 —, *Hugh R. Buggybud*, who got panicky and signed W4—/5 instead of W5—/4. Must work his 293 contacts all over again to correct the mistake.

W6 —, *Don B. Sophani*, who ran out of logsheets and scrap paper early in the Test. Used his tool-chest stock of sandpaper as an emergency measure and wore out 35 ball-point pens.

W7 —, *Wayne E. Wether*, who didn't get out worth a dern after he complained bitterly to the power company about an annoying power leak. They licked it by dropping his line level to 37 volts.

W8 —, *Willie Everbreath*, who sought to cash in on 1.8-Me. multipliers and rushed out to erect a long-wire with a spool of No. 8 Copperweld. Got it unwound, all right, but it sprang back into a roll from which he was finally extricated eighteen hours later.

W9 —, *Otis S. Terrybell*, who invited 147 friends and neighbors over on the week end preceding the Test, thereby assuring subsequent peace and quiet for an all-out effort. As the party guests arrived, found he had misread his calendar — that was the Test week end.

W0 —, *Prettywell Schott*, who swapped his smooth triple-conversion superhet for a nifty 5-element rotary in the interests of a higher score this year. Sat down to make a killing as the Test began, then committed suicide; no receiver.

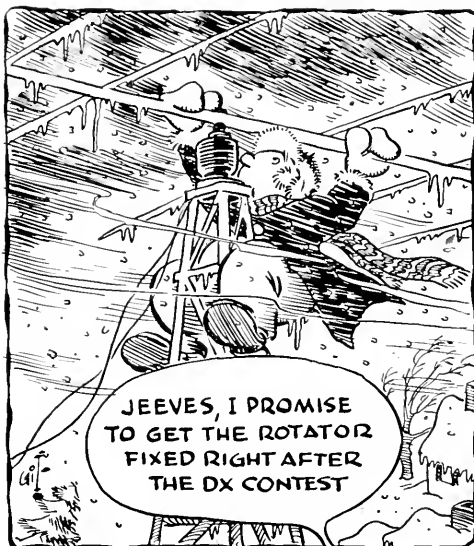
Our K, VE and VO friends were having their problems, too, but the foregoing brief grief accounts should suffice. No one need despair, though, for the last portion of the Test is still to come. Plenty of time to boost that tally — good fishin'!

## What:

Or should we have said good *fission*? That's just about what it takes to crack through the Test pile-ups around some of those gaudy numbers leaking through. We'll save a line or two this month by being a bit arbitrary, using Greenwich Time exclusively. And so to press . . .

Twenty 'phone, first off. W9RBI caught up with CR7CF (14,105) 19, GC6FQ (157) 15, HC8GI (159) 23 on Gala-

pagos, HK0AI (205) 16 of San Andres, M1B (114) 15, VQ8AR (146) 18, VS2DQ (195) 14 and 3V8BP (158) 16-17 . . . EL9A (325) 21, ET3Q (325) 17, MD5FA (185) 9 of Suez, MP4KAC (185) 14 and ZD3BFC (115) 21 hooked up with CNSIE . . . W9WHM collected EA8AI, KA0IJ (285) 22, TF5SV (110) 16, VQs 4RF 5EK (150) 21 and a ZD3, FB8BL (91) 21 and ZD2DCP (140) 21 were gottaways . . . That Iwo item, KAs 3RR and SSC worked W6UED, while W4BYJ settled for SP2AA and an HK0 . . . SWL S. Tonsi, Wisconsin, heard the boys grappling for ET2US (190), FM7WN (160) 18, KAs 21M (140), 8FC (198), OQ5s EC (125), FO (100), VP5 2KM (162) 17-18, 7NG (200), VQ2DT (141) and 5A4TL (130) . . . "200" DX Club sleuths tracked down ACs 3PT (190) 16, 4LM (270), 4NC (103) 12, CR8AB (170) 18, LZ1KAA (128) 14, MP4QAH (100) 13-14, OY2A (142), UB5KBE (100-150), VK1PG (132) 15, VP8AQ (118) 0, VU2AK (160) 14, YI2AI (110) 14, YJ1AA due back on soon, ZC3AC (163) 10-14, ZDs 2RWV (198) 19-20, 9AB (170) 23, 9AC (130) 20, ZSs 2MH (90-110) of Marion Isle, and 8I (345) 17-18 . . . Northern and Southern California DX Clubs cornered CR6s AT (121) 21, BX (143) 20-21, FB8BC (170) 5, FY7s YE (220-289) 17, YZ (125-185), GC2FZC (200) 16, HA5KBA (157) 15, KB6AQ (230) 19, SV1AZ (98) 17 of Crete, VK1DY (94) 8, VQ8CB (100) 15 of the Chagos, VSs 1FS (199) 14, 411K (30-200) 10, 5KU (25) 12-16 and ZD6BX (68) 17 . . . West Gulf DX Club's *DX Bulletin* calls attention to 14-Me. radiotelephones CN2AD (220) 9, CRs 6AC 22, 6CK (155) 21, 7AU (190) 21, 7CZ (139) 21, 8AC 8SA (53), 10AA, DU7SV (94) 7, EAs 9BC (129) 14-15, 9DF (187) 19 of Rio de Oro, 0AC (195) 9, EL2X (337) 18, FB8s BB (143) 22, BN (109-197) 19, BP (115-195) 18, XX, FF8BB (146), FL8AI (150) 18, FQ8AK (125) 21, FY7YA, 11B1MX/HE (101) 15, HZs 1AB (150) 14, 2AEH (105) 15, KTIWX (175) 14, MP4s BBL (70) 14-15, QAD 16-18, OK1MB (109-348) 15-20, PX1YR (130) 21, SP9s KAB (195) 15, KAD (138) 16, UB5KAB (132) 13, BKs 1AC (145) 8, 9RII (118-145) 5-7, VP5s 1GG (169) 2, 2DA (106) 22, 2KM (140) 17-18, 3YG (135) 22-23, 5AE (147) 19 of Turks, 8AO (158) 5, VQs 3RJJB (142) 21, 6LQ (119) 21, 8AL (115) 18, imminent VQ9NZK, VRs 4AE (180) 8, 3A, VS4BG 14, VU2AL, YN4CB (186) 22-23, YU1s AD (140) 14-15, GAI (105) 16, ZD8AA, ZM6AT (160), ZSs 3AH (130) 15, 7C (167) 21, 7D (125) 19-20, 9G (165), 3V8BL



\*New Mailing Address: Effective immediately, please mail all reports of DX activity to DX Editor Newkirk's new address: 4128 North Tripp Ave., Chicago 41, Illinois.





One of Portugal's outstanding DX enthusiasts, CT1CB runs 250 watts to the VFO rig at left, likes his S-40 inbaler and loads up a 20-meter half-wave skywire. A picture of the Portuguese Indian station of CR8AB, CT1CB's son, appeared last month.

Madagascar now sprouts hams by the dozens where formerly they were rarities. F88BC often can be found on 15, 20 and 40 meters running 25 watts of 'phone to a VFO-807 ensemble. His favorite time for W/K-hunting is 1700-1900 GMT. (Photo via W9RBI and ZS6BW)

(107-130) 8-15, 4S7s WA (208), YL (155) 14 and 4X4GB (100) 17. . . . . Newark News Radio Club 20-meter A3 loggings: AP20, CN2AB, CRs 4AG 4AL 6AG, CTs 2AG 3AN, DU1AL, EA8s AV AW, ET2AB, FF8AY, FM7WQ, FO8AD, GD3s ENK IBQ, HR1s CB BG, HV1CM (200) 13, IT1BXX, JA4BB, KAs by the dozens, KGs 4AO 4AR 6SB, KR6s AF HJ, KV4BB, LX1WA, OQs 5CX 5FL 5FN 0DZ, PJ2s AB AF AI AK, ST2NW, TA2EFA, TG9MB, YO2KAB, VPs 2DC 2GW 3HAG 7NV, VQs 2FU 3ES 4AQ 4ERR 4EZ, VSs 1PL 2BQ, ZD4BR, ZEs 2KE 6J1, ZS3P, 4X4DK 5As 1TT 2TZ 3TF 4TJ 4TL 4TR 4TY 4TZ and 9S4AD.

Twenty c.w. next, and the slot's a-jumpin'. ET3S (65) 16-17, VK1AC's 100-watter (45) 14-15, VP8AQ (80) 1-2, VQ6LQ (60) 20, ZA1BB (50) 18, ZD2DCP (85) 21-22 and enigmatic U5KBE (70) 15 answered W8YIN. . . . . W9AVJ (W9GVZ) got that U5s as well as EA8AX (83) 21, ET3GB (63), FG7XB (79) 18, JAs 1ACA 1CC 1TD 2AN 3AF 3BN 3DM 4AF 6AD 6AO 6FB 6HK 7DK 8AQ, KA3AC (59), KG6AAL (60), VK1EG (44) 14 of Antarctica and ZB1CH (52) 16. All those JAs hovered between 14,040 and 14,070 kc. . . . . OYZZ (30) 13, SV1AZ (105) 16, VP8BD (95) 14 and ZD6BX (83) 20-21 came back to W9RBI. . . . . CNSIE picked off AP2K (70) 9, F9QV/FC (70) 8, TF3MB (70) 12, UB5KAB (70) 10 and VP8AO (50) 20. . . . . At K2BZT we find EL5B (37) 17, ET3LF (19) 18, JA1CR (37) 22, KM6AX (75) 22, OQ5s CP (22) 19, ER (30) 18, VQ2JN (62) 18, YN1PM (10) 19, a ZA1, ZD4BQ (73) 22 and ZE3JO (56) 18. . . . . W1SSZ raised CN8EL (75) 13, FP8AP (71) 16-19, GD3UB (40) 15, PJ2CK (95) 12, SP2KAC 13 and ZB2A (25) 18-20. . . . . XG6A, a cutie giving QTH as Gulf of Mexico's Guanto Island, regaled many of the gang around 14,013 kc. . . . . W1OJR went at it hammer and tong, landing stuff like CR7s AD (75) 20, AF (55) 19, MB (22) 17, CT3AB (90) 20, EA8s 8BM (22) 18, 9AP (20) 18-19, an ET3, an FPs, FM7WP (25) 13, HP2TP (95) 16, OQ5LL (60) 21, SP3PK (10) 15, an Antarctica VK1, VQs 3FN (35) 18, 4FG (25) 18, 4FK (15) 20, ZEs 3JL (19) 18, 3JP (63) 20, 4JE (65) 19, ZS3HX (52) 17 and 9S4BS (38) 17, HC4MK (90) 23 and HK4BD also came back but weirdies WA1AB and CU3YY escaped Vic's net. . . . . The cream of W4TFB's bumper 14-Mc. c.w. crop are DU7SV 23, EA9DF 23, GC2FZC (65) 15-16, H18WA (24) an HK0, I1BFL (42) 15-16 of Trieste, JAs 1AQ 0, 3AB 23, LZ1KAB 21, OD5LC 18, ST2AC (37) 19-21, VQ2AS (65) 21, VR2BZ (56-70), YO3GY 18 and ZC4IP 16. Don's ill luck included EA8AX (50) 21, FM7WD, MP4QAH (40-72) 15, OX3UD (40) 17, SW0WY, a VQ6 and ZS7D (28) 19-20. . . . . W6QPM reached 126 by way of FO8AX, FY7YE (35) 13, GD3IBQ (70) 16, HA5KBA (85) 13-14, ISSV (47) 16, OY4XX (30) 16, VQ4RF and ZE5JJ. . . . . ET3Q (50) 20, Turks' VP5AE and 4X4DK (100) 15 enraptured W9KXK. . . . . W4YZC made off with CR6AI (21) 18, EL2X, KA2CR, PJ2AJ and a ZD6 thanks to his new 3-cl. whirler. . . . . Two fixed elements are enough for W3UXX to bag CR7LU (30) 20, a GD3, HR2AD, KG4AN, ST2NG, TI2RI, VQ2IM, ZE3JP (14) 9, ZS3K and 5AITC (46) 19. . . . . W2WZ fancied FO8AG (23) 21, LZ1KAA (41) 13-14, MP4s BBE

(77) 13, BBL (75) 13-14, VU2AL (55) 13 and 4S7LB (47) 14. . . . . JAs 1SR 3CS 7AD 8BL 0AA (not Iwo), KAs 2CG 2GC 8SE and KX6NA (134) hit the spot with W7PUA. . . . . A DXamination of doings here and there, at W7WAT: EL2P (45) 13, an ET3, FM7WM, W2GVZ: a DU7, a ZA1, W3WPG: CN8FQ, W6BIL: an ST2, a ZB2, W6SGF: FO8AC, JA3AB, KA2USA. BS 4-5, TI2BX, W7RVD: JAs 1N1 1XR 2LC 3BK 5CP 8AA 0BR, that KD6AT, KR6s KS OY, OQ5PU (25) 20, W3DLZ: one FG7XE (20), OD5LJ (25) 14-15, ZE6JF (23), ZS7D (27) 19-20. W0PWN: HR1JZ, W0VFM: FAs 8RJ (28) 14-15, 9VN (76) 20, VP3VN (54) 14. . . . . CE0AD (22), CR5JR (40), HH3DL (36), HR1MC (32), LU "Z" boys 2ZC (28), 7ZM (40), 7ZO (82), TA3US (38) and VP8AZ (20) answered W4ZAE. AP2R slipped Mick's hook. . . . . I1BNU/Trieste (35) 16, SP9KAD (40) 15 and ZB1JRK (17) 20 are among the many goodies spotted by San Diego DX Club stalkers. . . . . SCDXC's Bulletin and NCDXC's DXer specify 14-Mc. code catches EA8 9AR (55) 18, 0AB (12) 9, ET3AB (53) 15, FB8s BC (65) 18, BK (90) 0, XX (40) 13, ZZ (40) 15, GC8NO (53) 17, HE9LAA (64) 16, HZ1s AB (94) 15-16, HZ (53) 16-17, KP6AK, LX1AC (31) 15, LZ1KSP (73) 15-16, MIL (72) 15-16, OQ0DZ (28) 18, VK1PG (65) 8, VQ8CB (50) 19, VSs 4HK (35-160), 5KU (24-60) 20, ZB1s BF (22), BU (65) 15-16, CO (17) 15, ZD6RD (52) 17, ZSs 2M1 (150) of Marion, 3B 20 and 9S4AX (50) 15. . . . . WGDXC's DX Bulletin spotlights CRs 5AD (25) 20, 6CU (1) 21, 8SA (53), CS3AC (90) 16, CT2AF (58) 22, FB8s BL (83) 20, BR (25) 17-19, FE8AE, FK8s AO (88) 21, AP (30) 14, FO8s AB (80) 4, AK (65) 4, FR7ZA (18) 18, HA5s KBA (85) 13-14, KBN (68) 14, HV1OR, HZ2AEH, KC6GZ (80) 22, KJ6AZ (93) 23-0, KH6OR/KM6, LZ1KPZ (49) 14, OD5AX (69) 14, OQ5HI (60) 18, OYs 2Z (53) 13-23, 3GA (81) 15, SP3s AK (29) 14, AN (50) 14, PK (41) 15-16, SV7AZ (80) 13, UA1DH (62) 14-15, VQs 2DR (17) 19-20, 2GW (40), 2W (90) 22, 21, 3BM (78) 19, 5EK (69) 19, VR2CG (52) 16, VU2EJ (52) 14, YI2AM (60) 14, YO3RD (12-28) 15, ZB1AU (50) 13, ZC5SG (50), ZE4JE (3) 18-19, 5JE (62) 19, ZP9AY (50) 13, 3V8AN (25-45) 13 and hopeful ZD8AA of Ascension.

Forty is sporty, especially from the c.w. angle. K6EC put the bite on CN8GB (15) 22, CR9AF (22) 16, KG4AE (12) 2, KR6KS (17), VP8BD (24) 2 and VS6DD (15) 8. Ev also encountered characters A11BC (21), JK2OR (29) and KD6AT. . . . . EA8BF (40), ET2FQ (18), FG7XB (23) 12, LZ1KAB (25), TG9MB (22), VP8AO (12) and YS10 (8) contacted, or were heard by, W4ZAE. . . . . A 7-Mc. QSL from VK5LF/MM, QTH off the South Australian coast, confirmed that he used a 5-watt 25L6 rig when working W2OBX. . . . . W4TFB worked CN8GB 6, FAs DA6, RJ0, ZZ7, I1BNU/Trieste 3, KG6CX 10, LU "Z" brethren 1ZT 2ZC 2ZI 4ZB 8ZO 8ZS 9ZM and a healthy helping of VP8s. . . . . CRs 4AL (10) 3, 7CD (6) 4, 7CI (27) 3, EL2s C (12) 22, X (12) 22, HK0AI (7) 4, LZ1KSI (18) 8, TF5TP (10) 0, TG9LM (7) 0, VQ4EZ (13) 11, ZC4PB (18) 22, ZS7D (13) 21 and 3V8ES (11) 21 swapped 73 with W4YIH. Jim also heard, or heard about, 7-Mc. possibilities UA2AC, VQ4BNU, VS6CG

(29), **VK9RH** of Norfolk, **ZAs** **1KAB 4KBA** (9) and **4S7NG** (25) . . . . . **W7JLU** did fine with **JZ0DN** (12) on Biak Isle, **KC6CG** (30), **KG6IG** of the Volcanoes (25) and **VK9AU** (40). **UA0s** **KFA** and **KJA** (28) wouldn't come back . . . . . **WN3ZOG** managed nice Novice-style **DX** in snagging **CN8MM** (190) 0. Any other Novices working Africa on 40? . . . . . **CE3DZ**, **HH2LR**, **TF3MB**, **JAs** **1AFF 1KM 2LC 3JA 3LK 5AA** and many Europeans **QSOd W6RZS's** 813 . . . . . 40-meter frolicking hither and yon, at **W1WAI**: **HC1LE** (25) 12. **K2ALA**: **CT3AB**, **EA6AE**, **TF3AB**, **VP7NG**, a Trieste II. **W3WPG**: **EA9DF**, **HA5KBA**, **OE5AH**, **ST2AR**. **W4WR Y**: an **FG7**. **W4 YZC**: **EA0AC**, **HR1JZ** (20) 3-4 **W5CAT**: **DU7SV** (20) 9, an **HK0**, **OK1MB**. **W7UKA**: a **DU**, **JAs** **1EA** (6), **2BL** (2), **3JA** (6) . . . . . 7-Mc. c.w. club surveillance, by **WGDNC**: **OX3AY** (28) 2-3, **ZS3HX** (20) 4. **SCDXC**: **FB8ZZ** (20) 7, **VK1s** **EG** (20) 7 and **DY** (20) 7.

Forty 'phone, courtesy **NNRC** digging: **CR6BC**, **CT2AG**, **EA6BK**, **HI6TC**, **HR1FM**, **JAs** **AEA AGU**, **KG6GX**, **KJ6AZ**, **TG9s** **LR VS**, **VK9s** **FM OK RC RM**, **VPs** **1RS 2GW** and **VS2CP**. Definitely a band that separates the men from the boys!

Eighty c.w. came into its own of late and no mistake. Though spotty at times, the north Atlantic path treated the whole U. S. A. to Europeans by the logflus, **FA8DA** (10), **KL7s** **APZ** (9), **AWB** (10), **FAJ** (8), **KM6AX** (32), **OKs** **1DE** (9) and **2KSV** (9) fell prey to **W9GVZ** at **W9AVJ**. **G2PU** around 3800 kc. had a stand-out 'phone signal . . . . . The better items at **K2BZT** include **CT2BO** (10) 1, **HA5KBA** (3) 5, **LA2HE** (10) 6, **OE2JG** (7) 4, **OKs** **1MB 1KTW 3AL** and **9S4AX** (3) 1. Hayden also riddled five Swedes, eight Germans and 14 Britons . . . . . **EL2X** made the long hop into the ledger of **W7JLU** on 3510 kc. **VK5KO** also nabbed the Oregonian . . . . . **W4YZC** captured **GD3UB**, **OK1s** **KBW KTI**, **YV5BJ**, many **Gs** and a **9S4** . . . . . A **CT2**, **OZ4X** and **TI2BX** (6) 1 will **QSL W1WAI** . . . . . **W9UDK** bagged an **EL**, **KL7PI**, **OX3AY** and many Europeans with his 12-foot-high window. George also was among the unlucky ones to catch the phoney 3.5-Mc. **FG7XB** . . . . . Jeeves' recent misinterpretation of **W2ESO's** report, switching Gene's heard and worked items, was not in the nature of a base canard. **OE3SE** was a new number on 3.5 Mc. for **W2ESO** . . . . . **W2QHH** made off with **HB1MX/HE**, a **KM6** and **ZK1BG**, all lovely 80-meter munchings . . . . . The **DX Bulletin** adds **EA9AP** (14) 0, **FA9VN** (13) 6, **HB1HQ/HE** (20) 7, **ZS3K** (12) 5 and **4X4GB** (1) 2 to the 3.5-Mc. stew.

Fifteen 'phone continues its able role as a substitute for old friend ten during the latter's m.u.f. vacation. **W9RBI** took a liking to 21 Mc. after sessions with **FB8BC** (220) 18, **KW6BB** (270) 22-23, **VQ2FV** (220) 18, **YU1GM** (255) 17, **ZB1AUV** (170) 19, **ZSs** **7C** (150) 17, **9I** (240) 16 and **4X4DX** (15). Ross advises that **VP5AE** of Turks has rocks on 21,140, -180, -200, -220 and -310 kc., **A3** . . . . . **W1CTW** has 61 countries on 15-meter c.w. but still seeks his first Asian **QSO** in 30 years. The **ARRL DX Test** now in progress ought to do it! . . . . . **KA2KC** and **KJ6AZ** bounced back to **W6UED**; **KC6AA** and **TI2BX** likewise to **W6SGF**, all **A3** . . . . . **W6ZZ** made it 67 on

## CAUTION

Under this country's treaty obligations and on formal notice received from other nations, FCC-licensed amateurs are warned to engage in no communications with stations in the countries listed below. This is in accordance with FCC Public Notice of December 21, 1950 (p. 23, Feb., 1951 *QST*), and as since revised.

*French Indo-China* (Cambodia, Laos and Viet-Nam), *Republic of Indonesia*, *Iran*, *Korea*, *Thailand*.

Prefixes to be avoided: *FI8-XI's*-3W's, *PK* (Netherlands territories excepted), *EP-EQ*, *HL* and *HS*.

21 Mc. via **ZM6AR**. Miles also grabbed **KA2KS**, **KV4BD**, **VP6GT**, some **ZLs** and **ZS3AB** . . . . . From **W8YIN** we hear of **CR6BH** (225) 18-19, **VQ2AW** (165) 20 and **ZD6BX** (50) 19 . . . . . **NNRC's** most recent roster of 15-meter 'phones: **CN8s** **MF MM**, **DU7SV**, **ELs** **2X 10A**, **FA3JY**, **OE1USA**, **OQ5s** **BI GU**, **VP3YG**, **VQs** **2ST 3CB 4BF 5CJ**, **ZC4JA**, **ZD9AD**, **ZE2JK**, **ZSs** **3AB 3BC 7G** and **4X4BG** . . . . . **WGDNC** found **FY7YC** (40) 19-20 and **ZE5JJ** (30) 20 using c.w.

One-sixty c.w. grudgingly gave ground under persistent onslaughts. **W1BB** and **W9PNE** reached 28 and 17 countries worked on Low Band, respectively. Several hands were out after their last continents for 1.8-Mc. **WACs** but the going was rough. This **DX** is being worked or heard by **W/K/VE/YO** participants: **G2s** **AJ HX PL**, **G3s** **ABM AJZ BKF BRU ERN EHV GGN GIO HDZ HIS HKQ HRW IGT JDK JED JEJ JZJ JOJ JVL PU QD**, **G5s** **JU R1 VB**, **G6s** **GM LB PD**, **GD3FBS**, **G13s** **HCG IVJ**, **GMs** **2BUD 3HRZ**, **GW2INO**, **EI9J**, **HB9CM**, **KP4s** **CC DV KD**, **KV4s** **AA BB**, **LU3EL**, **OK1s** **III KTI**, **TI2BX**, **VP7s** **NG NM**, **YV5DE**, **ZC4GF** and **ZL3RB** . . . . . **W9PNE** writes: "Very anxious for Asian **QSOs**. **DX** must stay below 1835 kc. to be readable here. Best frequencies are 1826 to 1831 kc., and 1870 to 1875 for those who can operate outside the U. S. A. band." . . . . . By next month's deadline the dust should be settling after completion of both the 160-meter Transatlantic Tests and the 21st **ARRL International DX Competition**. Scribes **W1BB**, **W3RGQ** and **W9PNE** undoubtedly will fill us in on further 1.8-Mc. developments. Until then we'd better make the most of what's left of this sunspot minimum and squeeze the last **DX** drops out of old 160. Good luck!

## Where:

Guadeloupe **QSL** info courtesy **W4LYV**: Cards should be sent directly to **FG7XA** and **FG7XB**. If you desire your return **QSL** to arrive direct, send a stamped self-addressed envelope to **W4LYV** at Box 104, Miami; otherwise they'll reach you via bureaus . . . . . **W4LYV** also notifies that he's closing out his duties as **VP5BF** (Caicos) **QSL** secretary. The **VP5** now is believed to be Jamaica-stationed. Over

W0YDZ, who made his "How's" photographic debut last month, has this exotic W0YDZ/KC6 layout perking on Guam. A 5-element 14-Mc. rotary appears at left; the lethal-looking object at right is a 10-element 10-meter job.





4000 VP5BF Caicos cards have been distributed; if you still have one coming, ship that stamped self-addressed envelope to W4LVV ----- VP5AE, of Grand Turks, desires similarly-prepared envelopes from those who wish direct QSLs: Maj. D. E. Evelyn, PAA, Grand Turks Island via Patrick AFB, Fla. Otherwise, QSL via WSLMO and await your confirmation via the bureau route ----- "Still awaiting permanent quarters so I haven't yet unpacked. Expect to be settled shortly and hope to be on the air thereafter." So writes W4VE, ex-KA9AA-KR6AA, who expects QSL inquiries at the address to follow — full QSO data necessary ----- W1s ARR CTW MX OJR SSZ UED WAI WPO ZDP, W2s OLU WZ, K2BZT, W4s TFB YIID YZC, W6s SGF UED ZZ, K6EC, W7JLU, W8YIN, W9s AVJ CFT EU GVZ RBI RTY, CN8IE, PJ2CJ, NCDXC, NNRC, OVSF, SCDXC and 200-DXC got the goods on:

ex-AR1WW (QSL to W3VLG) ----- CN8EB (QSL via W3WDJ) ----- CN8HX, F. Murray, W1IRE, 29 Ferry St., Boston, Mass. ----- CR6CW, Box 1100, Lubango, Angola ----- CR7MB, Box 12, Quelimane, Mozambique ----- ex-DL4WK, Capt. M. S. Arbogast, K6DOM/7, Hq. 9470 Tech Unit, AEPG, Ft. Huachaca, Ariz. ----- ex-DL4YK, SFC E. F. Diehl, jr., 9470 Tech Unit, Det. 1, AEPG, Ft. Huachaca, Ariz. ----- EA8BM (QSL via URE) ----- EL2C (QSL via W1JOJ) ----- ex-EP1AL (QSL to W3VLG) ----- ET3LF, Box 114, Addis Ababa, Ethiopia ----- ET3Q, Box 1636, Addis Ababa, Ethiopia ----- F7EH (QSL to W1SWX) ----- GC6FQ, Col. P. Northey, ex-G6FQ, Pendern, Mont Felard, Jersey, C.I., U.K. ----- HC4MK, Box 2327, Quito, Ecuador ----- HK4BD, Box 2263, Medellin, Colombia ----- HP1AW, Box 586, Panama, Rep. of Panama ----- HZ2AEH, APO 616, New York, N. Y. ----- JZ9DN (QSL to PA9DN) ----- KA2GC, SFC G. I. Clineman, Sig. Opns. Co., 8060 AU, APO 343, San Francisco, Calif. ----- KA2KC, L. Cox, Box 14, Navy 830, FPO, San Francisco, Calif. ----- KA2RR, Staff USN COMSTS W. Pac. Area, Navy 3923, Box 73, FPO, San Francisco, Calif. ----- KA2WL, NAF, Navy 875, FPO, San Francisco, Calif. ----- ex-KA9AA-KR6AA, Co. F, Westervelt, 54th Med. Gp., Ft. Benning, Ga. ----- KL7BHL, PFC C. Wrathford, 333 C/R Co., APO 949, Seattle, Wash. ----- KL7BNU, Western Electric Co. Unit, APO 722, Seattle, Wash. ----- KR6OY (QSL via W7UMH) ----- ex-KW6BB (QSL to W6UMP) ----- KZ5DK, Box 500, Balboa Hts., C. Z. ----- KZ5MN,

Box 415, Amador, C. Z. ----- OE6JR, J. Rauschl, Graz, Austria ----- OE6YR, Ursula Rauschl, Graz, Austria ----- OK1HI, J. Hyska, Cechova 31, Praha XIX, Czechoslovakia ----- OQ5HI, Box 634, Elisabethville, Belgian Congo ----- SV1AZ, Box 15, Candia, Crete -----



Wherever there's a far-flung expeditious outpost you'll invariably find ham radio. Together, these two QSLs are a unique collector's item, both stations having been active at the same time from opposite polar ice caps. Nope, they didn't QSO.

UB5KBE, P.O. Box 352, Odessa, Ukraine, U. S. S. R. ----- VP1RS, R. Squires, 1144 Pickstock St., Belize, Br. Honduras ----- VP5HQ (ex-MD1A), Caribbean Sig. Sqdn., Uppark Camp, Kingston, Jamaica ----- VP5LE (QSL via VP5AD) ----- VP7NX (QSL via W6RRG) ----- VP8BG (QSL via W5GEL) ----- VP9CB, P. R. Gendreau, 1604 Materiel, APO 856, New York, N. Y. ----- VQ3HP, H. J. Powell, Mafia Island, Tanganyika ----- W1VDR/KH6, C. J. Brown, 3721 Radford Dr., Honolulu, T. H. ----- XG6A (QSL via LMRE) ----- ex-ZK2AA, W. Scarborough, 18 Norwich St., Auckland, N. Z. ----- ZS3AH, J. Swart, P. O., Okalandja, S. W. Afr. ----- ZS3F, C. P. Stiemie, Posbus, P. O. Box 1113, Windhoek, S. W. Afr. ----- ZS3P, P. C. A. Ferreira, P. O. Box 586, Windhoek, S. W. Afr. ----- 4X4FW (QSL via IARC) ----- ex-5A2CE, L/Cpl. Baker, 9 Med. Wireless Tp., MELF 12, Middle East ----- ex-5A2CH, 139 Rectory Rd. Gp., Essex, England.

## Whence:

Asia — JA1CV raps out a DX column for Japan's *Radio Experimenter* and regularly schedules K6DV. Kazu runs 100 watts to a five-stage VFO-807s arrangement on 10 through 40 meters, receiving with a homebrew 10-tube ----- British authorities continue attempts to obtain ex-AC4RF's release from a China mainland prison ----- WGDXC Asian tidbits: HZ2AEH gets around with a BC-610, 51J and 3-element spinner. W1JRA is confident of obtaining a permit for hamming in Afghanistan. VU2JP does QSL chores for ACs 3PT 3SZ 4NC and has Sunday 0500 GMT skeeds with the latter. VS1GH (ex-GM3AVO) occasionally visits Labuan and Nicolbar. EP3SS has hopes for early relaxation of Iranian ham radio prohibition ----- KD6AT's bearing appears to be Korea; too bad.

Africa — "I hope to go on a DXpedition to Ifni sometime in March provided I can obtain a visa and license to operate there. At present I'm making up a schedule for submission to the Spanish consulate in application for license and visa. I hope to be there at least one week and will operate mostly 20-meter 'phone." This from CN8IE (W0LRP) ----- VQ4EI and ZD6BX chorus a few don'ts for all DX hunters: QRM from indiscriminate and ill-timed calling is an omnipresent bugbear; only the rankest DX rookie should be caught calling a station before he hears its signals, unless it be on schedule. QSYing with final amplifier on is another frequent curse. Overlong transmissions are nuisances; let the rare-DX station set the pace and tone of QSO. Stepping on another fellow's final transmission is strictly for the boors; wait until you hear an SK from each end of a QSO before



Not far removed distancewise, but rare by reason of its small ham population, is Guadeloupe, F.W.I. A burst of activity on the part of Antoine Noel, FG7NB, however, has put this country in the logs of many happy amateurs recently. Look closely at the neat set-up above and you'll see Antoine's 10-watt transmitter — smaller than the bug — in front of the receiver. To the delight of U. S. A. DXers, FG7NB is currently plugging away at his WAS on 20- and 40-meter c.w. (Photo via Salt Creek Radio Club, W9AVJ)

barging in, and if both ends aren't audible, be careful. Working DX with a non-T9x signal is no accomplishment; you'll only be worked in self-defense. . . . . RSEA (East Africa) has discontinued its WEA (Worked East Africa) certificate award. They add, "We hope to issue a new certificate with revised rules in the near future and will send further details when available." . . . . . Present active ZD6s include BX EF IJ IJN JL and RD. . . . . NCDXC and SCDXC Africanisms: ZD3BFC looks forward to two more years on 20 and 40, A1 and A3. ZS5JY is about to put his rotary atop a 150-foot h.c. tower and rival ZS1SW hoisted his wide-spaced job to the 115-foot level. ZSs 7C SE and 9H regularly are heard.

**Oceania** — In WIA's monthly organ *Amateur Radio* we note that top Aussie DXers per call area are VKs 2NS with 195 countries, 3BZ 224, 4HR 210, 5FL 143, 6RU 199, 7LZ 116 and 9GW 150. . . . . Yank hams interested in the NZART (New Zealand) WAP and WAZL awards can save time and postage by writing W0IUB. Roy will forward full details upon receipt of requests accompanying stamped self-addressed envelopes. . . . . SCDXC and NCDXC Oceanograms: F08AD QRTd in favor of European TV activities. VR6AC is preparing a rig for Pitcairn action. FK8AL, just back from France, goes at it with p.p. 80Ts. Routine relief of Australian expeditionary outposts may see VKIs DC and ZM replacing AC DJ and GA on Macquarie; VKIs AWI and RA may spell EG in Antarctica. EXP4BBD still endeavors to crack the red tape wrapped around his future DU license on Luzon.

**Europe** — This month sees the arrival of European DXcentment. USKA (Switzerland) throws its annual Helvetia-22 ball from 1500 GMT, March 19th, to 1700, March 20th. All amateurs are invited to participate, "phone and/or c.w., on all bands from 3.5 through 30 Mc. Stations outside Switzerland will strive to work as many HB stations in as many Swiss cantons (states) as possible. "CQ HB" or "CQ Switzerland" is the key. Scoring is simple: 3 points per band-QSO, this total to be multiplied by the total number of band-cantons worked. The exchange is the usual RS or RST report followed by the contact number (001, 002, etc.). But it's a task to tell the players without this scorecard of canton abbreviations which will be appended to IIB9 or IIB1 call signs: AG, Argovie; AR, Appenzel; BE, Berne; BS, Basle; FR, Fribourg; GE, Geneva; GL, Glaris; GR, Grisons; LU, Lucerne; NE, Neuchâtel; NW, Unterwald; SG, St. Gall; SH, Schaffhouse; SO, Soleure; SZ, Schwyz; TG, Thurgovie; TI, Tessin; UR, Uri; VD, Vaud; VS, Valais; ZG, Zoug; and ZH, Zurich. Logs, a separate sheet for each band, may be sent to USKA Traffic Manager HB9CZ. Certificates of merit are to be awarded to the three highest entries from each DXCC List country. And don't forget that USKA offers a classy H-22 sheepskin to each amateur who can submit proof of contact with all of Switzerland's 22 cantons. 'Tain't easy! . . . . . REF (France) sponsors an opportunity for amateurs throughout the world to further DUF award aspirations. Dates: radiotelephone, 1200 GMT, March 5th, to 2400, March 6th; continuous wave, April 16th-17th, same hours. All amateur bands may be used and the exchange is the same as that for the H-22 shindig. A "CQ REF" ought to set the ball a-rollin'. Logs, scores and comments can be addressed to F8TM, REF, BP 4201, Paris RP, France. . . . . D1AOR may attempt some HY1ORing about the time you read this. . . . . URE's EA5 contingent threw an on-the-air QSO spree over the past three months which netted lucky parties interesting DFV (Diploma Fallas Valencia) certificate awards. The deal was held in conjunction with Junta Central Fallera, Valencia's recent "Festival of Fire" spectacular. . . . . ON4s LJ and QX, Antwerp area members of UBA (Belgium), call attention to the WOSA "Worked Only Stations in Antwerp" diploma now available world-wide. W/K/VE/VO aspirants must obtain QSLs from five QSOd Antwerp ON4s, "phone and/or c.w. For full details write ON4QX. . . . . G3JOQ, radiop aboard British lifeboat *Aries* on its transatlantic test cruise last summer, writes: "On behalf of the captain and crew of *Aries* I wish to thank hams for their kind and able assistance. The QSLs which they will receive will be 'collectors' pieces' for there will be only nine at the most for U. S. A. out of a total of 140." . . . . . W8SHW, who recently completed a tour of U. K. duty, desires to express thanks to the G gang for outstanding hospitality received. Maurice befriended over 50 British amateurs and was a participant or interested observer in many of their organizational and operational undertakings. . . . . PJ2CJ points out that a few PJ-

prefixed Netherlands calls were issued in error. PJ calls henceforth will be N.W.I. issues exclusively. . . . . PA0GER wants a tracer on 1952 SV0s WO and WW, also noting that SV0WM is ex-W9SGC.

**Hereabouts** — FG7XA paid a recent personal visit to W4LVV and the two got together on the Guadeloupe QSL problem. XA took back with him a BC-348Q inhaler to augment the 6V6-S07 rig he uses, as well as antenna wire for himself and FG7XB. Both radiops are with PTP, the French version of CAA. W4LVV also supplied Andre with much miscellaneous gear plus some extra crystals to help the boys duck the pile-ups. . . . . T12BX's XYL has taken to hamming *con gusto*, assisting in keeping the Westlake installation warm for a good part of each day. T12BX works all bands, 160 through 15 meters, and one of their fortes is the accumulation of MM QSOs. The Westlakes picked off 78 countries in less than eight months of casual DXing. A Viking II, an NC-183 and several beams are employed. . . . . Two more states on 160 will give W2QHH WAS on six bands. A new Ranger rig and a higher skyhook are bound to help. Howy now has 111 countries collected on 3.5 Mc. and has QSOd some 400 YLs 'twixt DX sprees. . . . . W1CTW tells a story about the neophyte DXer who thought CN2s and CNSs were Chinese Novices! . . . . . YN1PM is ex-W10EK-W4SXD and expects to remain in Nicaragua indefinitely. Paul has a c.c. 25-watter readily workable on twenty. . . . . W3UXC could use a hint or two regarding means of securing VS9BC's QSL. . . . . W4KRR dropped in on a January meeting of the San Diego DX Club held at K6EC's diggings. . . . . Old-school DXer W9FLH, now relaxing with a 40-watter while contemplating a better DX QTII, would like a tip toward up-to-date info on old friend prewar J2GX, father of the yagi. . . . . The Salt Creek Amateur Radio Club gang at W9AVJ prepared for the 21st ARRL DX Test with a vengeance. Up went a 6-elementer on 10 meters, 108 feet high; 5 elementers on 15 meters, 100 feet up; and 5 more on 20, only 92 feet skyward. . . . . Big-sigger W4ESK now is back in the DX badlands as W7ESK, according to SCDXC sources. . . . . WGDXC has it that YN4CB has DXpeditionary eyes focused on the Great Corns; VP8AQ uncorked a batch of QSLs Statesward; and FP8AP sports a new 811s rig courtesy W0AIW.

Deign to dig the new Chicago address of your conductor; we'll try to hang onto this one for a while. (It's a wonderful spot for Jeeves to continue his indoor-loop antenna experiments.)



Ham radio provides valuable release and relaxation at our outposts in the Far North. Call signs VE8OC, VE8SD, VE8SM and VE8YT are in use among the ten members of the Frohisher Bay, N.W.T., Amateur Radio Club shown here. (Photo via W4HYW)

# Net Know-How

## *Improving Emergency Communications Effectiveness*

BY E. S. VAN DEUSEN,\* W3ECP

• In any emergency operation, the ability to handle third-party traffic promptly and efficiently is a "must." W3ECP bases his recommendations on experience gained in actual emergency net operations.

**A**MATEUR RADIO exists as a hobby because it qualifies as a service."<sup>1</sup> The extent of our service is limited by our ability. The responsibility for furthering these abilities is up to each one of us. Experienced traffic men will undoubtedly want to add to the following observations and suggestions for improving operations during an emergency. All hands will agree, however, that almost all amateurs are extremely coöperative during a communications emergency. The occasional operator who fails or refuses to coöperate during such a period deserves short shrift, with thorough application of the Wouff-Hong and the Rettysnitch.

The operator who learns of an emergency and experiences the universal desire to help may unnecessarily delay and complicate the flow of traffic, if he has little or no concept of acceptable net procedure. He can best serve by familiarizing himself with the situation by *listening*. Careful listening will enable an operator to locate stations and places and to get a good idea of the over-all situation so that he will best know *how* to help if needed. A desire to help through transmitting is often more hindrance than help. If you're not needed, silence is the biggest help! Eagerness to aid isn't an excuse for breaking into the net. Proper procedure by the net control should provide opportunity periodically for additional stations to report in. Only when urgent information pertaining to the situation at hand should be made known to the NCS is breaking-in permissible. Having once reported into a net, however, every station should monitor the net until he is excused by net control.

### ***C.W. Circuits Always Advisable***

In the initial stages of an emergency, much may depend on a single station's ability to communicate with the unaffected area through use of "flea-power" c.w. equipment. When commercial power fails, there may or may not be an emergency a.c. source available. On the other hand, there undoubtedly will be auto storage batteries in the area. Reliance on such primary

power sources requires the ready availability of suitable vibrator or dynamotor units. It is obvious that c.w. circuits should always be provided whenever and wherever possible, as either the primary or a secondary channel into the affected area. No single emergency situation has been observed recently in which the amateur effort could not have been aided materially by the use of *both* 'phone and c.w. In several recent situations involving 'phone emergency networks, a request for supplemental c.w. circuits, or an inquiry regarding the possibility of setting up such circuits, has been included in the operations shortly after the net had been organized.

### ***NCS Qualifications***

Efficient management of a net of any sort, and especially one working under emergency conditions, requires firm discipline by a suitable net control station. The NCS should be capable of hearing and being copied by a majority of the participating stations. This individual (or group) should be thoroughly familiar with control procedures, and cognizant of the propagation conditions that currently exist on the band in use. He should be able to think logically and quickly. Real competence as a control station can best be attained by practical experience. Book learning alone can't replace the knowledge gained from hours spent listening to net operations, analysis of the various situations which arise, and thinking out a better way of handling them if you had been NCS. A frequent turn as NCS is an invaluable aid to put your ideas into action and test your reactions.

### ***Net Discipline the Responsibility of the NCS***

The supreme authority for priority and traffic routing is the net control station. In an emergency the first station becoming aware of the situation should assume control and retain it until some station better qualified (by virtue of experience, location, or ability to contact a greater number of participating stations) becomes available. When a previously organized and trained net is involved in the incident, this is fairly simple to accomplish. Generally speaking, the most effective emergency networks are organized before an emergency. In many cases, however, the net organization is evolved *after* the situation arises. When this occurs, the station first assuming control must exercise a high degree of common sense in analyzing facilities which become available, and should act quickly and without rancor in turning over control to a better qualified station

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<sup>1</sup> ARRL manual, *Emergency Communications*.

that reports into the net. On the other hand, until such a transfer is made, no other station has any right to attempt to usurp the control function.

In prolonged operations involving the services of a succession of net control stations, a complete list of stations active in the circuit at the time, the areas they serve, and the outstanding traffic, if any, should be given to his successor by a control station who may be leaving the net.

Experience with established traffic nets has conclusively demonstrated the increased efficiency which results from the use of at least two or three adjacent channels. One frequency, preferably the center frequency, should be used for monitoring by all stations, and transmission by the net control. The additional channels are used as message-clearing frequencies. On c.w. nets, a separation of 5 kc. is sufficient; on 'phone, a wider dispersion may be desirable.

When FCC declares a general state of emergency, a 10- or 15-kc. band segment may be designated exclusively for emergency communications (Section 12.156, FCC Rules and Regulations). With this in mind, it's logical to start net organization (under these conditions) on two channels about 8 kc. or so apart, and modify the arrangement as the situation develops. During such an emergency period, "guard" stations should be assigned the specific job of transmitting the FCC order and warding off interference.

### ***Provisions of the Law Must Be Observed***

A possible law violation (Section 605 of the Communications Act) may inadvertently occur when press representatives are permitted to be present in the amateur "shack" during emergency operations, especially when the operation is being handled by 'phone. They should be reminded that the Act states that the content of the communications may not be divulged to or used by any person or persons except the addressee or his agent. "Pirating" of traffic is an obvious violation of the Act. When situations arise in which a station may be in a position to deliver or expedite certain traffic that has been copied during monitoring, permission must be obtained from the transmitting station to accept the message. Only when this station releases its own commitment does the monitoring or requesting station become authorized to handle the traffic. Under no circumstances is a listener permitted by law to put pirated traffic on another net; this might easily result in duplicate delivery of two widely differing versions of one message, in addition to being a distinct violation of the secrecy provisions of the Act.

### ***Accuracy Is More Important Than Speed***

*Accuracy first* should be the motto governing all traffic operations. It is especially applicable to an emergency situation when lives and property safety often depend on the messages being

handled over the amateur network. Accuracy is more readily achieved when uniform message procedures are employed. Uniformity of the message form is very important. In emergency situations, it is always desirable to include the filing time which is frequently omitted from the message preambles routinely handled on normal amateur circuits. The use of standardized texts such as the appropriate ARL-Numbered Text<sup>2</sup> and the "book message" method and, whenever possible, a combination of both, can result in the movement of a surprisingly high volume of traffic when applied with common sense. The receiving stations should withhold a "Roger" (voice) or "QSL" (code) for any message until it is certain that the entire message has been completely and accurately transcribed.



More effective voice intelligibility is obtained by the use of words instead of c.w. abbreviations. (In military practice, accepted 'phone procedure prohibits the use of coded c.w. prosigns and requires the use of the worded meaning.) For example, the use of QRX<sup>3</sup> instead of "wait" may be misconstrued as QRS unless phonetics are used to clarify the letters QRS. You'll wind up by saying the one word "wait" anyway, so use it in the first place and you'll avoid confusion and time loss.

Many 'phone operators speak too rapidly for the average operator to copy. The time spent in securing "fills" or confirmations often takes longer than would have been required to clear the entire message if it were transmitted at a proper rate. It is very helpful to speak in phrases, allowing time between phrases for the receiving operator to copy legibly. As a rough gauge, transmit the

*(Continued on page 150)*



**USE PHONETICS FOR TRULY-DOUBTFUL OR  
DIFFICULT WORDS ONLY AS REQUIRED**

<sup>2</sup> Note last sheet bound into ARRL Logbooks. — Ed.

<sup>3</sup> Actually, QRX means: I'll call you again at a specified time. — Ed.

# Three Stormy Sisters

## Part II† — Hazel

BY GEORGE HART, WINJM

COVERING more land area than either of her older sisters, Hazel probably did by far the greatest amount of damage. We received reports from each section on Hazel's route, plus a good many reports from sections on her fringes. And this gal had *some* fringes. Although she passed through Central Pennsylvania and Western New York, Hazel produced sixty-mile-per-hour gales and torrents of rain in many areas not more seriously afflicted.

On the evening of October 14th, Hazel approached the Carolina coasts. The South Carolina Emergency Net was already in operation under PAM W4FFH, assisted by W4HDR and W4HMG. At 0130 Georgetown EC W4ZGP assembled his AREC members W4s FTN GIL KTI COA and DYP to place W4ZGP/4, the club emergency station, on the air. This station was manned throughout the night.

At 0300 W9MQV/4 reported into the net from Myrtle Beach, and also remained on through the night. W4LLH helped maintain contact with the coastal stations through the night. Communication and power lines began to fail by 0800 Friday morning and weather reports from W9MQV/4 and W4ZGP/4 enabled the Weather Bureau to determine that the hurricane went inshore at Murrells Inlet, S. C., at 1000 Friday.

Continuous contact was maintained with the Georgetown and Myrtle Beach stations with on-

† Part I of this article appeared in January, 1955, *QST*.

• We asked for them, and we got them — more reports on activities during Hazel than we could possibly use. In this second installment of the hurricane story, we have tried to stick to facts and credits in condensing volumes of report material into a few *QST* pages.

the-spot reports being sent showing the extent of the damage as it happened. Intercepts of ham operations as provided by W4FFH were being broadcast over radio and TV stations in Charleston. W4ULH/mobile was sent from Florence, while mobiles W4UOQ and W4QRH were sent from Charleston. These emergency stations were confronted with a most serious situation. All communications and power lines were out. There was urgent need for troops, blankets, emergency rations and medical supplies. Through W4ULH/m and W4HDR in Columbia, Myrtle Beach authorities were advised where rations and blankets were available, and that National Guard troops were being ordered into the area. Shortly W4UOQ/m with W4ZRH riding with him reinforced W4ULH/m. Police officials and reporters rode with W4ULH/m to tie in with police radio and the outside to conduct emergency operations. Georgetown power failed about 1000 and control was shifted to W4ZGP/4 from his car, using a long wire to replace his mobile antenna at 1400. Then mobile W4s ZGP COA and KTI cruised Pawleys Island and near-by beaches. The amateur mobiles coordinated with other units to provide communications with damaged areas.

On Friday W9MQV/4 was back on the air by 1730. Weather reports by ham radio assisted the Weather Bureau to give an early all clear.

In Florence, EC W4AUL had mobilized his AREC group W4s DXW TSU VAM VOH ULH and LLH long before the storm struck. W4LLH maintained contact with W9MQV/4 all night Thursday. W4ULH/m was dispatched to the coast Friday morning. W4s AUL DXW TJA and TSU helped dispatch ACL trains. On Saturday morning the AREC membership cards permitted amateur mobiles to cruise into restricted areas to continue their work. Only those messages of highest urgency were accepted for delivery. On Saturday evening, W4s ZGP DYP and FTN set up a transmitter unit at Myrtle Beach and operated all night.

Operations were carried on for days after the storm with W4FFH conducting the net almost continuously, assisted by W4s HDR ZIZ and HMG. W4BNN provided contacts with Dillon



W4KFC's beam elements don't always have this graceful curve. This is a shot taken during the height of the storm in Annandale, Va.

When Hazel decided to take a jaunt over-land, Myrtle Beach, S. C., was the first to feel her fury, and Al Powell, K4AQQ, was there waiting for her. From this compact station layout, K4AQQ (who was signing W9MQV/4 at the time) provided sole contact with Myrtle Beach for many hours.



and W4MPR with Marion county. The following stations deserve special recognition: W4s ZGP FTN GIF KTI COA DYP UOQ ZRH ULH FFH HDR LLH AUL DXW TSU VOH VAM ZIZ HMG STN TWW IZD K4ADP USN W4MPR BNN TWW TJA and W9MQV/4. PAM W4FFH logged 168 stations reporting to assist.

EC W4SOD reports that Lumberton lost power at 1051 Friday, October 15th, and he, from his mobile rig, became the only contact from the area.

In Raleigh, W4HUW operated entirely on emergency power from 1330 October 15th until 2000 October 16th, mostly in the Tar Heel Emergency Net. Among those reported as participating, W4HUW lists W4s ACA APP AHY AWM AUL AWC AJT ANU ATC AEF BMD BUA BFB BTZ BDH BIP CCG CPL CVQ DIU DJC DCI DRC DVR DXJ EFX EPI ED EC EYZ FRH GNF GJS GOB HZX HPS HAY HCB HSO HUW IBT INL ISH JZQ KYI LWU LPN LR LGT LVZ MVP MPR MBR MDR NC NHV NTQ NYN NRN NY PZE QI RXH RCZ RRV RJ RRH RAZ RNA SCS SGD SVD VZW VWM VUA WSS WUW WDN WTF YPZ YPI ZMG ZQB ZQA ZEA ZAV, K4s NAW NRI WAR FDY WBI, W3STU/4, K2BSC, and W0WDJ. The net handled about 2000 messages from October 14th to 20th.

The Virginia 'Phone Net and the Old Dominion Net combined forces on 3835 as the Virginia Emergency Net starting on October 14th and operating continuously until the evening of October 16th. FCC declared 3830 to 3840 kc. a clear frequency within 1000 miles of the coast. Doing yeoman service as NCS were the following: W4s PCC (operated by W4s BTL GPS LNX JXE KQC SBZ UGO ZZV and W8NYH) TFX HQN SIE TVO ONV VYG NV SB and BTL. W3BHK served almost continuously as liaison with Washington, assisted by W3OHL. W4VYZ acted as relay to handle traffic between the Pentagon and Fort Monroe, Va. W4KX lists the following known participants: W4s AAD ACA AHY AJA APP AWQ/4 BCW BGZ BIG BLR BMH BSM BUS CKI CLD CSC CYK/4 DWP DXJ EC FPR FV CWY/m GBD HJH JAQ JAU JG KAV KBE KDJ KSE KX LAS LHC MAN MRH MT NBA NPT NY OGX OKM OM/m OXY PHL PJT PMF QCA QEL/4 QIE/m RCZ RDI/m RGN/m RGZ RJW RLA RTV TFZ TJA TJW TLA UBC

ULZ UMC VAH VOD VW VYZ WEL WLQ WUW WYI/m YCC YKB YVG ZBU ZCL ZMG ZNT ZUQ; WN4FTD; K4s ABQ AF AIR MC NRT; W1UKZ/4; W2FYT; W3s BHK BAI BRC JE JTU/4 LUV/4 LZY NOL OHI HDV STU/4 TVJ/m TYU UF WBJ WVF/mm WZN YF; K2FBD; W9GWY/4.

In Hampton, W4AJA was on the air from 0800 on Saturday until the same time Sunday morning, when c.d. control W4RGN took over. W4VYZ handled a crucial message to Fort Monroe via W9GWY/m near Washington. The following stations in Hampton participated: W4s AJA RGN MAN/m VYZ/m RTZ QCA/m ZXL GZD/m JCM. W4RGN and W4QCA operated on emergency power.

In Norfolk, EC W4PAK alerted the AREC gang at 1900 on October 14th, and 29 mobiles and two net control stations turned out. Participation was on both the VFN frequency of 3835 and the local 29.6 Mc. frequency. By 1500 on Friday the winds had reached 100 m.p.h. and things started to happen. Communications were handled for the power company, the Weather Bureau, Civil Defense, and local Red Cross and emergency traffic was being handled as fast as the net could take care of it. All transmitting was done with auxiliary power equipment. When the 75-meter antenna blew down at the control station, W4PWX and W4LCW maintained communication for Norfolk.

EC W3WN of Frederick, Md., reports a close tie-in with Frederick police, working with them from the time Hazel hit Frederick (1745, Oct. 15th) until about 2100. Mobiles were dispatched with policemen to points of hazard. The Frederick net mobilized without being alerted.

In the Washington area, W3KZQ, W3NL, and W3ECP were early on the job getting the Washington Mobile Radio Club organized at the request of the D.C. Chapter, American Red Cross. W3WLA took over net control on 29,520 kc. at 1615 on October 15th and checked in mobile stations to take part (almost 100 per cent). W3KZQ conducted the 1800 roll call on emergency power. W3ECP maintained close contact with the Red Cross during the blow. Stations listed as active: W3s AQZ DAH DZZ ECP EOY EQH FVD FZ IEF IZL KZQ MAX MBZ MSU MYA ND L NL NUT ODK OLK OPO QBC



RCZ RXJ SFY THP WAM WLA WOX WXA  
WYP YAE ZER, W4s: BF BFN DWD EFJ  
EHO GEB CJJ JKN JSG KCX KMG LL OP  
TNQ TTA UEQ VYP YWF ZZ.

The AREC of Washington County, Md., was alerted by both Civil Defense and Red Cross and by 1415 October 14th seven AREC members had three fixed stations and five mobile units ready for action. By 1800, fourteen AREC members were monitoring 3827 as well as assisting the MEPN and the VFN with emergency traffic, with five mobiles and one portable power unit on a stand-by basis. The alert was secured at 2030. Stations on deck: W3s CIQ CKJ CSX EHA NZT OAY ONL OYN RAH SCC TJV VAM WWM YRK.

The Maryland Emergency 'Phone Net was active on 3920 kc. At 1155 on the 15th, the emergency plan was put into effect. At 1650, FCC declared 3815-3825 kc. an emergency channel. The frequency clearance was withdrawn at 2200, but many members continued operating throughout the night. The following day operation continued, most traffic being relay of information north and south concerning the extent of the damage. As conditions deteriorated Saturday night, FCC gave voluntary clearance on 3820 at 1800. The net was official signed off at 2000. W3FWR submits this list, with apologies to anyone left out: W3s AKX AVL ADQ AED BM BSV BRU BHK DKT EHA EPC EQK FRV FWR FII GA GD HWR HXN HWZ HL IJF JZY JE JQN JH KMT KVM KAN KZH KAV LZY LUV MCD MAX NJT NST NNX NNS OHI OLK OKZ PMQ PRL PQT PPY PV PGB QDI QAN QQH RU RMD SSC SZW SOG SPT TJV TDV TUX TAT UNV UAC UQS UAB UWV UF VAM VPN VZZ VCN VVV WKB WTF WBY WV WBP WEH WEM WZN YWK YYF ZME ZA ZZK, K3s FBD WBJ NAR WAS, W2FUW, W4s BUS HZ NFD.

Mobiles in Anne Arundel County under EC W3SLG got together as prearranged at 1700 on the 15th and manned the control center, using emergency power since regular power was off. Net Control W3VPR (manned by W3JKU and W3SLG) contacted State Control W3WBP on 29.64 Mc. W3TRG/m was assigned to handle Red Cross communication. W2UQS/m was stationed at Edgewater police station. Telephones

Hazleton, Pa., was one of the cities hard hit by Hazel. EC W3DUI activated his small group and operated on emergency power. That's him at the telephone, while W3OHX uses the mike.

failed at the control station at 2000, and all communications were handled on 6 and 10 meters. Clearance from emergency was obtained at 2200. Damage was slight. Other mobiles in the act: W3s NLX LHK VU NAE OEJ TRG UKO UQS.

In Allegany County, amateurs under EC W3PMQ installed six-meter equipment at the police station and the club room of the Mountain Radio Club at the American Legion building. The call W3YMW was used. The following amateurs participated: W3s ECU MGO KMT UAB UAC, WN3s YII YIJ and WSGHS.

The Radio Officer of Maryland's Fifteenth C.D. District, W3QLG, was called upon to provide communications and enlisted the aid of W3s FMG WCW KLA and WN3YLQ, all with mobiles on two or ten meters. The mobiles went into action at 1730 October 15th. Evacuation was their main task, the mobile units being placed at the disposal of the c.d. officer in charge. All communications and power were out in the area until the following day. Mobile units were released at 0400 October 16th.

W3AVL reports for Southern Maryland that considerable damage was wreaked by high winds in that area, after weather reports had indicated that the hurricane would pass to the west. Electric-power failures occurred at intervals from 1100 until 1700 on the fifteenth, at which time power in the entire area was shut off, and telephone service also was out. W3AVL operated with emergency power. On Saturday W3AVL/m traveled to St. George's Island where information on the amount of damage to houses and other property was reported via W3PPY.

In Cecil County, W3VZZ started organizing the local net at 1430 on the 15th. At 1600 his power went off, so his station was set up at the fire house, with the help of WN3ZVX and W3TXR. The station was put on the air, immediately reported into the net and started handling traffic. The county c.d. director was much impressed with this operation.

As a result of activity of Maryland amateurs during Hazel, a letter was received by State Radio Officer W3JE from Maryland Governor McKeldin saying, in part: "It is gratifying to me to know that our State has such a magnificent communications network which can be utilized in the event of any large-scale disaster. I compliment you and your associates for your outstanding organizational activities and hope that my congratulations for a job well done can be extended to your membership."

On Friday night October 15th from 1800 to 2000 Hurricane Hazel unleashed its fury on Delaware. W3SQV, chairman of the local "Blue Hen



Mobile Group," at about 1700 called the Net on 29,520 kc. and offered service to the Wilmington Red Cross and the Delaware State Police. Those standing by were W3s FFF NNK PCZ QWR QZI SQV TDU TKM UO and W4ANL/3. The group was released by the Red Cross and the State Police at 2130.

W3BHK did a great deal of relay and contact work for Washington Red Cross during the hurricanes. During Hazel alone he indicates 60 sent, 40 received, 33 relays and 22 patches. He operated 48½ hours, 5½ of them on emergency power.

In Montgomery County, Pa., EC W3CNO reports communication established with state-level key station W3OJE at 1920 on the 15th, and set up monitoring watches on 28,888 and 29,493 kc. between the hours of 1800 and 2100 EST. The following stations called in: W3s TER/m TWQ VST. W3s HYU and IGW were listening. All stations had mobiles available in case of need. The net was secured at 2100 EST.

York County (Pa.) got the brunt of the storm, and by 1500 on the 15th power was off in large sections of the county. W3GES took over as Acting EC and took part in the Pennsylvania Fone Net, acting as NCS for a part of the time. Earlier, W3GES had alerted three other local amateurs with mobiles and had offered services to the local Civil Defense and Red Cross. W3GES was assisted by W3VNJ and W3WWF.

Hazel roared toward the Philadelphia area in the late afternoon of the fifteenth. The city's c.d. volunteers were alerted and manned the c.d. centers, starting at 1800. Members of the Phil-Mont Mobile Club checked in from their radio-equipped cars and stood by for assignments. The Fox Chase Control center lost power after 1900, but a generator on a c.d. rescue truck was utilized to supply power. The centers were allowed to "secure" at 2145. A partial list of participants as submitted by EC W3DYL: W3s SQW VKO ULR SAM YUH WMY SLP DYL NJS FPC YAX VSC OWK UQV RKP VCE VCY DFJ JWC UOE PST.

Luzerne County had some activity, reported by EC W3DUI. He got together with W3OHX, who had emergency power available, and about 1900 when power went off operation commenced from that station. The police and c.d. were served by amateur communications. W3THB and W3PVY were also on hand and two mobiles were ready.

The Pennsylvania Fone Net, under W3PYF, did an excellent statewide job during Hazel. W3PYF asked W3GES to start organizing the

net at 1525 on the 15th, while he set up his emergency power and took over the net at 1600, by which time 26 Pennsylvania stations had already called in. QRM gathered, too, and with the assistance of W2JWN, W3UKF and W3BHK FCC was asked to declare a clear channel which they did (3850 plus and minus 5 kc.) at 1915. By 2000, 21 stations had called in.

There was also activity in the local Northampton County (Pa.) Net on 29,640 kc. The Bethlehem C.D.-Red Cross stations were activated with W3QBF at Red Cross and W3NNT and W3PQX at C.D. headquarters, both on emergency power. Contact was maintained with mobiles in the stricken area at all times (W3s NF OK QMH ELH and W1UVE).

The New York State Phone Traffic and Emergency Net was in operation starting at 1700 October 15th with K2BYO as NCS. W2s ZRV UNF JNM ILI and YXE consecutively took over NCS duties, and at 2300 Oct. 15th when skip lengthened, WSPXF assumed net control, and later W9VRK. The net was closed at 0115. About 52 stations participated.

In Broome County (N. Y.) the two meter net was in operation with W2s SWF/2 OW PST/m JOJ FCG QXX HJS UJS HZP/m DOM SDA and K2CWD. The Binghamton area was badly hit, and W2SFW/2 was set up at the Binghamton Sun offices to receive reports of damage.

At about 2000 on October 15th, electric power and half of the telephones went out in Oswego County. EC W2ZHU/m, W2UMI and W2FFU went into action on 2 meters. W2UMI reported two fires burning in Mexico, N. Y. The AREC stood by to assist in fire communications until the fires were brought under control at 2300.

Four Oneida County stations reported in on 3925 kc. about 1730 October 15th and remained until 0100 Oct. 16th. Two meters was monitored from 1800 the 15th until 1200 the 16th.

In Seneca County, local AREC mobile stations were alerted at 2045. At 2130 Hazel struck the area, commercial power went out and many trees went down. From 2135 to 0030 the mobiles assisted in providing emergency communication for the police, who had no emergency power. At 2230 until 0030 mobiles also provided additional communications for the Sheriff's Department. Participants were W2s YPP HNK and K2s BFF HMY and DYA.

The Finger Lakes 2 Meter Net was in operation

The Northampton County (Pa.) AREC gang activated the station at c.d. headquarters in Bethlehem during Hurricane Hazel. The station operates under the call W3PQX/3 in the Delaware Lehigh Amateur Radio Net. Left to right are W3OK, W3PQX and W3NNT. (Photo by W3PYF)



from 2000 to 2300 Oct. 15th. Stations in this Net included amateurs in Monroe, Ontario, Wayne, Cayuga and Genesee Counties. Participants were: W2s BCL BLP CTA ECM OWF QY TKY UNP VBH ZHB ZS UTH, K2s BWK CEH DBB, KN2INO.

In the Syracuse area, W2BTB was kept busy with weather and radar reports to the local Red Cross Chapter Disaster Chairman, and handling a number of welfare requests for Red Cross' Home Service Department. At Red Cross headquarters, W2CRD was activated and performed valuable service all during the hurricane.

Hazel poured between five and eight inches of rainfall into the Toronto area within the space of a few hours, precipitating unprecedented floods. More than fifty bridges and culverts were washed out, and hundreds of homes near the river were washed away or damaged. The AREC plan of listening on the emergency frequencies of 3765 kc. and 51 Mc. was followed.

Of the v.h.f. group, VE31Z was the first to become active, out in his mobile at 0730 on October 16th. VE3AIB joined him at 0900, and shortly thereafter VE3BQK/m and VE3BYY came on. These four set up a v.h.f. net on 51

various search parties and headquarters was maintained via VE3s ARV/m IZ/m and AIB/m.

This grim task was not the end of it for the Toronto gang. Communications were out in the area for several days after the hurricane, particularly in the Westmount area, and the AREC was instrumental in providing communications for emergency purposes. As late as October 24th, the Toronto v.h.f. group was working with officials in Westmount, Etobicoke, Woodbridge and Pine Grove, as well as Toronto. Mention should be made of the supplementary work of the following: VE3s AIB ATB ARV/m AZY BJB BYY BYZ DER DQW DHG IZ and UT.

Low frequency groups were also active in the Toronto area. VE3EAM alerted VE3s BBM and EAU, then took off for Woodbridge. Arriving at 1200, Bert set up his equipment in the municipal office, and the first message he handled was from the mayor requesting troops, food, medical supplies, etc. From then on he handled a constant stream of urgent traffic to VE3BBM who relayed to VE3BJV for delivery by Toronto telephone.

Nets were also set up and operative on the ten and 75 meter bands, under VE3NG and VE3RG respectively. VE3NO did an admirable job as net control on the 75 meter net, and VE3NG turned in an outstanding performance on 10.

The Hamilton AREC group was called in on Sunday the 17th to help in the Woodbridge area. Six cars and a portable unit were immediately dispatched. They set up immediately on arrival and helped with communications for the Red Cross and Fire Department. Later, they opened a ten meter net to Toronto. In action: VE3s KM DGJ DRM AXV DRI AGJ BOW CJM EAB DHQ CJ CC AYW and BV.

All in all, a stellar job done by Ontario amateurs, especially the gang in and around Toronto. Here's a list of participants not already mentioned above: VE3s AZX ATR AWY APN AET AJA AID AIA APF AXW AMB AEU AYO AMT ANL AOE AGW AIS ANY BWA BQT BBM BJI BUT BRI BCT BBX BCR BKV BAX BLQ BIV BTY BNK BNW BJV BWE CD CP CJ DDT DHL DTO DFN DZA DUG DSG DNE DLS DEW DQX DFP DPD DEG DFA DFK DCF DNK DNA DIQ DAT DAK DOW EAO KW GK RU RH IL HZ TA NS GJ VG RW NI HO GG LN OR SI HS VZ YD VT WY VE2UQ. Our thanks to VE3KM, VE3AIB and VE3IL for their comprehensive reports.

The swirls of Hazel's skirts produced havoc elsewhere than along the path of her baleful eye. W2RTE reports activity in Eastern New York section comparable to that in Carol and Edna, nets operating on 75, 10 and 2 meters. W2RTE himself had to set up emergency power to stay with the net on Saturday. Even over in eastern Mass. the effects of the hurricane were severe enough that six members of the Falmouth Amateur Radio Association formed a net to maintain contact with Civil Defense, the Coast Guard and the National Traffic System. The amateurs who turned out were W1s QLT LYV DVS UXG and TJW with the club station W1WNM as NCS.



This innocent-looking contraption is an emergency generator. Simple enough, but it spelled the difference between being on the air and not being on the air during Hazel in a great many places. Does your AREC group have one, ready to go at a moment's notice if needed? Hazelton has, and this is it, plugging away during Hurricane Hazel.

Mc. and advised the 75 meter net control, VE3NO, of their availability. VE3IZ/m and VE3BQK/m were dispatched to Woodbridge while VE3BYY/m and VE3AIB/m went to the Weston area, both hard hit. VE3DER operated fixed to keep them in contact with telephones. The next day mobiles were dispatched to Weston to assist in the search for bodies. The 51 Mc. control station (VE3AZY/3) was moved from CD headquarters and set up in the Weston police station, with VE3DQW assisting. From approximately 1300 until 1730, communication between

The six-meter gang was very active in the Toronto area during the hurricane. This is VE3AIB, one of the Toronto ECs, operating equipment belonging to VE3IZ in Weston, Ont. This set-up, from a church location, provided emergency communications for over two days from Weston.



W2ZAI reports activity in both Queens and Nassau Counties, N. Y. In Queens, the ten-meter net was in operation from 2030 on the 15th until 1300 on the 16th, with 25 stations reporting in. Six members stayed at the Queens County Control all night: W2s AFA AKR ANK CVU CJP and ZTX. Early Saturday morning mobiles W2ZTX and W2ANK were dispatched to Rockaway Beach, along with W2CJP. Traffic handled was in regard to flood damage and evacuation. The Nassau County AREC was alerted at 1630 on October 15th by EC W2FI. He set up W2FI/2 at the Red Cross, and three other stations, W2KEB, W2KFV and K2DHC (operated by W2JKX), were activated. Mobiles used both 2 and 10 meters. Forty-four stations reported into the net, three from Suffolk County.

Although considerably west of Hazel's path, flooding occurred in the Ohio River Valley. Amateur radio was called into action at Steubenville by the Red Cross, and three stations were set up. Operators taking part included W8s DNQ ERR JNL SFI EZC ZE1 V GK EZH and CHE.

In the Camden, N. J., area, two and six meter nets were activated by the South Jersey Radio Association at 1800 on the 15th. W2YRW was NCS of the 2-meter net from his car at first. Later, W2PAU took control using emergency power. W2TBD assisted the local police in Medford and Medford Lakes. W2LY reported from mobile that cross-country high lines were falling near Route 38, hampering vehicular traffic. Others reporting in on the two-meter net were W2s EGP JRO PEN NFL VX ASG OQN PTM PZX, K2AFJ and KN2s GYH GYN and JE1. K2AJD was NCS of the ten-meter net, assisted by W2QBH and K2BWG. The roll call produced W2s ABQ YPQ CIJ FTO CKX TXP, K2s DWY BZK, W3s AOE/2 OEN and HEK. Many of these were mobiles. Contact was maintained with the Burlington County (N. J.) net on 29,560 kc. Operation of both nets continued from 1800 to 2200. W2YRW reports that 32 operators turned in 128 man hours of work in his area.

The Burlington County (N.J.) Radio Club also reports considerable activity during Hazel. With four mobiles and two fixed stations, the entire group of six stations was in operation during the storm: W2s EVR GOK JJV WK1 WUP and ZNB.

The RACES net of Conn. Area 4 was active during Hurricanes Carol, Edna, and Hazel. The

net control station, W1TIJ, is located in the State Police barracks in Colechester, which is equipped with auxiliary power. The following radio officers were active: W1s IWY YFG UQV/1 ZYJ/1 NPB EBO KZQ NPE/1 MHF and LF. W1PHP is radio officer for Area 4.

The transcontinental Relay Net again was on alert following the path of Hazel and sending out bulletins concerning her progress, speed and direction. The frequency of 7042 was kept clear for the bulletins and reporting stations. Net stations, especially those in Hazel's path, kept close touch with their local weather bureaus both to receive and give information. The net likewise did a most commendable job of handling a great deal of long haul emergency traffic, much of it of an official nature. Many of the stations were operating on emergency power. Net manager W3CVE submits the following list of participating stations: W1s QA YEL, W2s BO CGG EQG IFP QDM, K2BJS, W3s BFF CUL CVE DVO IA RQK/4 UUA WWQ WOR WZL, W4s AMZ ARV ATS ATC DNB DNR ENI EJQ HIH MCY MPF ONK SVG TJI UWE VPD VHH WQT, K4WBK, W6s BOM/2 EUM ULS, W7CCL, W8s AUJ CJK DNC FUM FFW IZQ ZWE, W9s JUJ NZZ RHA UIN VBZ WRO, W0s AJD CIO GBJ KA, VE3s BXF BUR DUY, KL7ATO/W9.

### Epilogue

Many of those who reported also reported the many lessons they learned in operating under emergency conditions as hurricane followed hurricane into some of the most populated and industrialized parts of our country. These three diabolical visitations, similar to but more extensive than the series of tornadoes we experienced in 1952, have a parallel in atomic warfare. What we amateurs did in the hurricane emergencies we must be prepared to do in the event of nuclear attack, multiplied manifold. If the visits of Carol, Edna and Hazel can be considered in any way to be good, then it was because of the "shot in the arm" they gave to emergency preparedness everywhere they visited, and to the increased awareness on the part of public officials, Civil Defense and otherwise, of the values and potentialities of the radio amateur.



# Operating News



F. E. HANDY, WIBDI, Communications Mgr.  
R. L. WHITE, WIWPO, Asst. Comm. Mgr., C.W.  
PHIL SIMMONS, WIZDP, Communications Asst.

GEORGE HART, WINJM, Natl. Emerg. Coördinator  
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., Phone  
LILLIAN M. SALTER, WIZJE, Administrative Aide

**More on FCC Suspensions.** Two amateur operator license suspensions were reported in these columns last month in *QST*. Looking at eleven other 1954 amateur operator license suspensions, there were some five kinds of violations that drew this type penalty. In each case the suspension required that the license be turned in to FCC and the station not be operated by any person for the specified period.

1) Two instances, violations of Sec. 12.157 by using "obscene, indecent or profane language" on the air, received penalties of 90 days (W4ESP), also four years' suspension (remainder of license term) was invoked in the case of another amateur licensee, now deceased, for wilfulness in committing this violation.

2) One Technician Licensee, WIUZZ, drew a 90-day suspension for operating on the 144-Mc. band contrary to his license privileges.

3) Three Novice (WN0QIY, WN9ZEV, KN6BOS) and two Technician licensees (K6AXX, W6CKW) received suspensions of 30, 90 days and for remainder-of-license term for violations of one, or combinations of more-than-one, of the following: use of A-3 in 3.8-4 Mc., or in 7 Mc. (12.23 d-e); using call not assigned (12.158); use of unmodulated carrier for protracted periods (12.134); and for failing to keep a proper log (12.136 b and f).

4) A suspension of 30 days was made in the case of WIZE for permitting operation by an unlicensed person, which is a violation of Sec. 12.28, and Sec. 318 of the Act, also for failure to keep an accurate log (Sec. 12.136) and failing ability to produce logs in the 1-year period prior to May 10, for FCC inspection, a violation of Sec. 12.137.

5) W6SAC's 30-day suspension was for use of power in excess of 1 kw. (12.131).

6) A suspension for remainder of license term was ordered in the case of WN9YDZ for using a frequency and call not authorized a Novice.

**On Improving Message Handling.** Besides the questions from amateurs newly interested in this field these days, some traffic netters are urging steps for progressively improved results . . . such as an increased use of the *service message*. Operating an Amateur Radio Station, page 12, gives the low-down on such between-station traffic, customarily started to get missing information, or report inability to deliver, or other aspects of the operating service. Each year for three years there has been a substantial increase of interest in traffic handling. With the trend continuing this year, we hope the "service message" will account for a proper proportion of the increase, for the great good this can do. Missing parts really should be queried at source (by originators), of course, so incomplete traffic never gets started! However, we suggest making it common practice to use the service message to get the missing parts when they are not put in by the originator. Undeliverable messages should be reported by message to originating stations in all cases. But let's stop at source, by reasonable interrogation, crippled traffic that has vital sec-

tions missing from the preamble or an insufficient address. Any service message sent not only counts in one's total but is a direct contribution to our amateur ability to handle record traffic in a praiseworthy manner.

**Edison Award Winner Acclaimed.** Ben Hamilton, W6VFT, ARRL SEC, of La Mesa, Calif., was honored February 10th at a Washington, D. C., public dinner presentation of the 1954 Edison Radio Amateur Award. This was in view of his outstanding civil defense communications, organizational and educational work in San Diego County, Calif. There were special citations for the notable services of Carl Theis, W8BKH, in constructing equipment for missionaries resulting in saving lives, and for the excellent amateur radio communications established and maintained by Carter Rogers, W8NCB, in the West Virginia flash flood. Besides proclaiming Mr. Hamilton award winner, the judges also adopted a resolution commending the meritorious services of more than 800 amateurs helping with emergency communications in the triple hurricane emergency. Besides the special honor to Mr. Hamilton, we regard this acclamation as a great honor and recognition of importance of civil defense amateur radio organizational work.

**Observations of a Novice** working in the Round-up are the subject of a letter from KN2IIW. He writes, "We can't all be perfect but calling attention to some of our operating errors in *QST* should help in improvement. I found myself going *over my speed* and having to correct errors, also extending my calls too long and repeating too much of my text. Then there is the man who has never heard a W1AW tape or so it seems . . . when he calls CQ you can only guess what it means. Another has a note like water bubbling in a pipe so it's a wonder he gets any answers outside of FCC citations. My pet peeve is a WN using a bug with jerky spacing; the dits get away from him. . . ." All amateurs will agree that a bug has no place on the air until it has been mastered in practice off the air! Sending in step with our W1AW tapes and with hand key is still a fine way to cultivate sending accuracy and judgment in "spacing." All amateurs will do well to monitor their transmitters. Use the receiver with antenna off, if no monitor is available, to check that note. It is our guess that all operators in taking part in the January Novice Round-up got useful practice in self-correction of common difficulties like poor choice of speed and calling times. Only by *practice* does one develop into a good operator who can get

most enjoyment and the best results with his gear. A specific objective such as the N-R calls for powers of coordination beyond casual work, and builds operating know-how.

**DX Test in Progress.** There's a second 'phone (Mar. 11th-13th) and a second c.w. week end (Mar. 25th-27th) coming up in March in the current ARRL International DX Competition. If you weren't all set for the February period it's not too late to try your hand at DX in March; and if you got a start in February you can very well extend your score in March or maybe grab off some of the new countries that will be in there! See the announcement in January *QST* if you need details. All scores and reports will be welcomed by ARRL.

Good luck, and in making out your QSLs always be sure they are sufficiently complete in information. The date, the band, the mode, the state (for amateurs working for WAS), the report for 'phone or c.w. and the fraternal spirit they convey are all part of the great tradition guaranteed by your signature, as the man behind the key or mike.

— F.E.H.

## BRIEF

Conducting code and/or theory classes? Drop a line to Headquarters for a card to register your class schedule. This information will help many newcomers interested in obtaining their Novice licenses.

## CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on March 15th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,010, 52,000 and 145,600 kc. The next qualifying run from *W6OWP* only will be transmitted on March 5th at 2100 PST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions will be made from W1AW each evening at 2130 EST. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes the order of words in each line of *QST* text sometimes is reversed.

Date	Subject of Practice Text from January <i>QST</i>
Mar. 2nd:	<i>More About V.H.F. Auroral Propagation</i> , p. 11
Mar. 4th:	<i>A Cubical Quad for 20 Meters</i> , p. 21
Mar. 8th:	<i>A Discussion of Receiver Performance</i> , p. 24
Mar. 10th:	<i>A Simple Rig for Six-Meter Mobile</i> , p. 28
Mar. 14th:	<i>A One-Element Rotary for 21 Mc.</i> , p. 30
Mar. 17th:	<i>Grounded-Grid and the 304-TH</i> , p. 33
Mar. 21st:	<i>Using the 6524 Dual Tetrode on 432 Mc.</i> , p. 38
Mar. 24th:	<i>Three Stormy Sisters</i> , p. 42
Mar. 30th:	<i>September V.H.F. Party Results</i> , p. 57

## W1AW OPERATING SCHEDULE

(All times given are Eastern Standard Time)

The W1AW fall-winter operating schedule remains in effect. Master schedules showing complete W1AW operation in EST, CST or PST will be sent to anyone on request.

**Operating-Visiting Hours:**

Monday through Friday: 1500-0300 (following day).

Saturday: 1900-0230 (Sunday). Sunday: 1500-2230.

**Exceptions:** W1AW will not observe its regular hours from 0300 April 8th to 1900 April 9th.

**General Operation:** Refer to page 70, September *QST*, for a chart to determine times during which W1AW engages in general operation on various frequencies, 'phone and c.w. This schedule is still in effect but is not reproduced herewith for space considerations. Note that since the schedule is organized in EST, certain morning operating periods may fall on the evening of the previous day in western time zones. W1AW will participate in all official ARRL operating activities, using scheduled general operating periods for this purpose if necessary.

**Official ARRL Bulletin Schedule:** Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules:

**Frequencies (kc.):**

C.w.: 1885, 3555, 7125, 14,100, 21,010, 52,000, 145,600.

Phone: 1885, 3945, 7255, 14,280, 21,350, 52,000, 145,600.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibration purposes.

**Times:**

Sunday through Friday: 2000 by c.w., 2100 by 'phone.

Monday through Saturday: 2330 by 'phone, 2400 by c.w.

**Code Proficiency Program:** Practice transmissions are made on the above listed c.w. frequencies, starting at 2130 daily. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately ten minutes of practice is given at each speed. Code-practice transmissions will be replaced by Code Proficiency Qualifying Runs on March 15th and April 13th.

## MEET THE SCMS

Washington's SCM, Victor S. Gish, W7FIX, first became interested in amateur radio in 1912, at which time he did some spark coil experimental work, but it wasn't until 1935 that he obtained his first license.

The rigs currently in use at W7FIX's basement shack include: (1) 6L6 crystal, 807 buffer, p.p. T-10s final for 80- and 40-meter work; (2) 6AG7 VFO, 6AG7 buffer,



813 final for 80 meters; and (3) 1626 crystal, 1625 final for 160 meters. Receiving equipment consists of a BC-312, an SX-71, an SX-25, an EC-1, and Command receivers.

SCM Gish is assistant director of the Northwestern Division, as well as Route Manager, Official Relay Station, and Official Observer, and is a member of the North Seattle Amateur Radio Club. In addition he manages to find time to enjoy participation in the CD Parties. His copying speed is 35 w.p.m., for which he has been awarded a Code Proficiency certificate. Rag Chewers Club and A-1 Operator Club certificates also have been issued to him.

At the age of 17 Vic joined the Navy and in 1917-1918 installed the first bridge-controlled radio on the USS *Pennsylvania*. In 1941 he was physically retired, was recalled the next year to be placed in charge of the wire room of the 13th Naval District, and was released in 1946.

Vic's hobbies include printing *PAN News* and reading westerns and historical novels. His pet sports are baseball and football.



Each year at about this time the officers and directors of the League prepare annual reports to the Board of Directors outlining activities and progress during the previous year. This gives the Board members something to think about (as if they didn't have enough worries already!) prior to the annual meeting. Naturally, the officers' reports are longer and more comprehensive, since they have to do with the conduct of League affairs on a nation-wide day-to-day basis.

In the Communications Manager's annual report, there is always a section devoted to the status of the AREC and emergency work in general. That means us. We do not use the pronoun "us" in the editorial sense, referring to the writer. It means you and me, all of us who are responsible for the affairs and activities of the Amateur Radio Emergency Corps throughout the year and throughout the nation. Your NEC is not in any sense the director of amateur emergency affairs; he is the coordinator of those affairs, the point of consolidation at which the things you do are pinpointed and moulded into a presentable nation-wide picture. He is entirely and utterly dependent on you for the size and shape and completeness of that picture. At annual report time, it is his job to paint the picture, your job to supply the paint. Naturally, if you supply only a small amount of paint, the picture is really not a picture at all, but only a sketch.

That's the way it has been in past years. The EC Annual Report form goes out with the SET Bulletin. About ten per cent of the EC's return them. This year, we sent out a reminder card, and it paid off to the extent of bringing in a dozen or so additional reports. A good many ECs replied that they had nothing to report of any consequence. Others had mislaid the report forms. Some reported informally, not even knowing that there was a report form. Most of them never replied to the reminder card just as they had never replied to the initial receipt of the form in the first place; probably an extension of the developing negative reaction to receipt of any printed third-class mail.

We have said before and we'll say again that we would rather have a good, active EC who never reports than an inactive one who reports regularly (usually, that he is inactive). First things come first; if energetic pursuit of your function as EC does not leave the five minutes or so per month for a Form 5 report or the half hour or so per year for an annual report, then let it be so. The report of statistics is not all important, but it is quite important just the same.

Perhaps next year, instead of burying the EC Annual Report form in the SET Bulletin, we'll make it the subject of a special, later mailing. Will that help? It's too late now

to send in your Annual Report for 1954, but file away a reminder to yourself to give your SEC and Headquarters the dope on your group regularly during the coming year, and fill out that annual report form you get in the fall.

We account for the two following items not by making any lame excuses — only by saying that they were deleted from our copy for June, 1951, *QST* (which already had two



Not all of our ECs are ugly old men. Meet up with W5CNM, EC for Blaine County, Okla., who not only adds charm to our unglamorous ranks but who also, from all reports, does a whale of a good organizing job in her area. Says SEC W5KY: "I wish I had a baker's dozen of ECs cut to her pattern." Not a bad idea, eh?

full pages of material), put into a "hold" file and have just come to light. Despite their tardiness, we want these items recorded in *QST*. Apologies to W2SJV and W4SPD respectively.

On March 29, 1954 a severe snowstorm hit the Buffalo area, causing traffic jams and people to be late or unable to get home. Mobilers W2ISI, K2DVD and W2LYE, by contacting other amateurs, were not only able to get word to their own families of their predicament, but performed the same service for a great number of other motorists caught in the same traffic jams. Taking turns as NCS for the improvised net were W2a CMS and GVJ. Stations taking traffic included W2s MYN NZA UXs POM PRI ETX K2GIF, VE3DDO.

A tornado hit the Macon, Georgia, area on March 13th, 1951, taking off the roof of W4SPD's house and all his transmitting antennas. After settling his family, he went to the home of EC W4LXE and found Stubby already on the air using emergency power, with four mobiles already out searching for stricken areas. The mobiles relayed needs of victims back to W4LXE, from whence they were telephoned to the Red Cross (W4SPD is chairman of the Macon Red Cross Disaster Communications Committee). Mobiles were manned by W4s LQW JMW LXE and ZYA. W4s UJC UMN and SPD manned the kilowatt at W4LXE. W4TAZ operated his fixed station for relay work. Although fortunately all areas were available to mobile units this time, the Macon Amateur Radio Club has begun construction of a number of two-meter hand-carried units. Others active in this emergency were W4s DZL TED YWW and KL7AQJ/4.

While traveling along Skyline Boulevard about forty miles south of San Francisco, and participating in the Skyriders Net, W6WD noticed fresh skid marks on the highway. Slowing down and investigating, he discovered that a car had crashed 25 feet off the highway into a ditch — out of sight of the road — and that two ladies and an elderly gentleman were injured. W6WD broke into the net ahead of turn and apprised them of the situation. K6EER telephoned the San Mateo County sheriff and a radio ambulance and patrol car were dispatched. While the ambulance was en route, W6WD administered first aid to the injured parties. W6ANK was net control, and the entire net remained on the air until everything was well under control. Thanks to K6EER for reporting this incident.

This is precisely the sort of thing we were talking about in August *QST* last year (p. 66). K6EER suggests that amateur mobiles equip themselves with first-aid kits in order to be the more useful in such a contingency.

A tornado struck the town of Wellington, Ala., with practically no warning at about 1330 on Sunday, Dec. 5, 1954,

### NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C.W.	'PHONE
3550 14,050	3875 14,225
7100 21,050	7250 21,400
28,100	29,640

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: C.W. — 3535, 7050, 14,060; 'phone — 3765, 14,160, 28,250 kc.

### NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.



causing 30 casualties and several hundred thousand dollars worth of damage. Amateurs in Anniston were alerted by W4BCU, who notified W4SUF and W4GCV. Organization began at 1430. SUF/m, in contact with GCV, was unable to reach the stricken area because of poor visibility. W4PJB, with W4VOQ riding with him, was the first to reach Wellington, after having difficulty getting through Highway Patrol roadblocks. Services were offered to the Highway Patrol, Red Cross and Civil Defense. W4s UHA and OAO undertook to establish contacts on 75 meters. The Alabama Emergency Net (AENP) was alerted and put on stand-by. Contact between the two nets, one on 75 and the other on 10, was maintained by landline. W4DZF/m was dispatched to a hilltop to establish contact with both PJB/m in Anniston and with control station W4GCV. From this point he acted as a relay station during the entire emergency, and also succeeded in establishing contact with W4EBD in Birmingham. At 1600 W4s SVM/m and SUF/m joined W4PJB/m in Wellington and operation settled down to routine. All traffic originating in Wellington was relayed by W4DZF/m to W4GCV in Anniston. W4YCO was assisting W4DZF/m. The Red Cross furnished casualty lists which were relayed to Wellington, Birmingham and Gadsden. W4s OZK and PAC/m operated from Padoden. Mobsiles remained at the Wellington site until about midnight, at which time they were released. Traffic was handled for the Governor, Red Cross, Anniston Fire Dept., Anniston Police Dept., State Highway Patrol, National Guard, the Birmingham News, the Anniston Star, Civil Air Patrol and Civil Defense.

— W4GCV, EC Anniston-Oxford, Ala.

Ninety-six amateurs participated in an air-raid drill held in Pittsburgh on October 25, 1954. Ninety-three stations were available. The complete Allegheny County emergency radio system was operated in accordance with RACES plans. The network operated on ten meters, and tie-in was effected with state e.d. networks operating on 75 meters. EC W3LMM reports that the distribution of all stations in the individual zones was excellent. In one zone he deliberately refrained from notifying the control station of the yellow alert, just to see what would happen. A mobile unit took over as zone control prior to the red alert, and immediately following the all-clear the regular zone control station was active. W3LMM (who is also radio officer for RACES) feels that the drill was most successful; participation increased 100 per cent over a similar drill held last June.

Tennessee civil defense conducted a statewide alert on November 7th last year, centered around Knoxville, which was "bombed." SEC W4RRV reports that the AREC gang around the state did a good job for amateur radio. Cities represented included Knoxville, Chattanooga, Nashville, Memphis, Cookeville and Oak Ridge. The Tennessee C.W. Net was also active and received high praise from e.d. officials. In fact, one newspaper quoted the Chattanooga Area Deputy Civil Defense Director as saying that the local amateurs "can offer the best communication service in that field of anywhere I have ever seen. I am amazed at their service." Nice going, Tennessee gang.

Twelve SECs reported activities for November, 1954. Total AREC membership represented was 4330. None of the twelve was new to the reported list, so the total remains at 29 sections. We also had twelve reports for November last year. Sections reporting: Los Angeles, Western New York, New York City-Long Island, Eastern Florida, Wisconsin, South Dakota, Montana, Western Florida, San Joaquin Valley, Georgia, Colorado, Alabama.

Last December the Maryland Civil Defense Control Center was honored by an inspection visit from Maryland's Governor McKeldin. The RACES installation came in for its share of interest, as shown in the picture. The operators, left to right, are W3QLF and W3IFW. Standing, left to right, are W3JE (Md. C.D. Radio Officer), Governor McKeldin and Sherley Ewing (Md. C.D. Director).

## TRAINING AIDS

If you're a member of an ARRL-affiliated club and have not seen the films available to your group, ask your club secretary to write the Communications Department for a list of current training aids. At present they include 30 films, 13 film strips, two slide collections and ten different quizzes. The demand is high but items available *now* can furnish your club with many a lively and educational evening.

## DX CENTURY CLUB AWARDS

### HONOR ROLL

W1FH.....258	W3BES.....248	W6SYG.....245
W6VER.....254	G2PL.....247	W3JTC.....244
W6AM.....251	W6SN.....246	W3RBL.....241
W6ENV.....251	W3GHD.....245	W3CKT.....244
W8HGW.....251	W6MEK.....245	W2BXA.....243
W0YXO.....250		W5MIS.....243

### Radiotelephone

W1FH.....230	W1JCX.....215	W1NWO.....212
W3BES.....230	W1MCW.....215	W9RBL.....201
VQ4ERR.....225	XE1AC.....215	SM5KE.....207
ZS6BW.....221	W8HGW.....214	W3JXN.....206

From December 15, 1954, to January 15, 1955, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

### NEW MEMBERS

CT1JS.....159	W4GQE.....103	W0BCJ.....101
W1DIT.....122	W8MWL.....102	W2ONR.....100
F3CB.....107	K16ET.....102	W2MUM.....100
W9VP.....106	W5HDS.....101	W6ZEN.....100

### Radiotelephone

G6B8.....120	W2GLE.....114	W5KUJ.....101
ZL1KG.....120	W4HIF.....106	W4FPS.....100
	OD5BA.....105	

### ENDORSEMENTS

W2HUC.....210	W9ABA.....180	W6ID.....142
W5ASG.....240	KZ5WZ.....173	W2FNE.....140
W8KIA.....233	G6B8.....170	W0DNE.....132
W6VE.....220	H1KX.....169	PA0ZL.....131
OX1AU.....220	W6LJL.....168	W0NTL.....130
W0AIW.....212	W5DML.....160	W4BTE.....120
W2HIMJ.....201	W8LKH.....160	W5W1.....120
W9HUC.....200	DL1QT.....153	W3KDF.....120
KP4KD.....200	W3MDE.....150	W9TMU.....111
W2LDD.....180	W5DMR.....150	W1JEL.....110
	W3MPW.....145	

### Radiotelephone

W0AIW.....175	W9BVN.....148	W2JY.....130
W3KT.....170	CO2BK.....140	W2FNE.....121
W8KML.....161	CR6BX.....133	W1PST.....120
W2VWN.....150	W8BKP.....132	W5DMR.....111
CO2RL.....150		W8VDJ.....110

### W/VE/VO Call Area and Continental Leaders

W4BPD.....241	VE3QD.....210	VE8AW.....160
W7AMX.....238	VE4RO.....223	VO6EP.....190
W9NDA.....240	VE5QZ.....140	4X4RE.....210
VE1HG.....150	VE6GD.....108	Z8GBW.....229
VE2WW.....181	VE7HC.....209	ZL1HY.....231

### Radiotelephone

W2APU.....202	W7HIA.....175	VE4RO.....120
W4HIA.....177	W0AIW.....162	VE7ZM.....140
W5RGP.....200	VE1CR.....120	OD5AB.....154
W6AM.....199	VE2WW.....102	ZL1HY.....190
	VE3KE.....163	





## TRAFFIC TOPICS

W0KXL brings up the matter of the need for certain ending signals in traffic net operation. On QKS (Kansas Section Net) they follow a procedure by means of which any listening station who just happens to turn on his receiver or get tuned in can tell by the ending signal used by the NCS whether or not the way is open for him to QNI.

Perhaps we traffic men ought to adopt some sort of standard procedure in ending signals, since the signals adopted by ARRL after the war were adopted primarily with the needs of the DX man in mind. We hear KN used quite often in casual contact these days. The ending signal we hear most of the time, however, is AR K, which signifies nothing except that the transmitting station is ending a transmission. According to the ARRL code (Operating Aid No. 2), it would mean the station has just called another station and wishes any station to answer him. Not very logical.

W0KXL points out that ending signals should be used in net operation, otherwise the receiving station has no way of knowing when the transmission is ended. Perhaps he has a point. Most of us have run into this difficulty in our c.w. traffic nets. Here are a few examples of some ending signals that we need:

- 1) Acknowledge instructions.
- 2) Reply desired by stations concerned only.
- 3) Do not reply, or no reply necessary.
- 4) End of QTC list (used by station reporting into net).
- 5) Stations may report into net.

We're collecting suggestions on the above. Anybody have any?

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Miscellaneous Net Reports: (1) The Transcontinental Relay Net had a traffic count of 1622 in 31 sessions, averaging 52 per session; five stations participated. (2) The Transcontinental 'Phone Net reports 14 stations handling 827 messages. (3) North Texas-Oklahoma Net handled 531 messages in 31 sessions, 854 check-ins. (4) The Early Bird Transcontinental 'Phone Net handled 1304 messages in December, making their total 9519 for the year 1954; they count each message only once, no matter how many times relayed.

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United Trunk Lines announces that its directors for 1955 are W3WV, W6DDE and W9TT. Each division averaged close to 1300 messages per month in 1954.

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Those of you who prefer 'phone and don't mind climbing out of the hay at a rather early hour might like to have a whirl with the Early Bird Transcontinental Net. This net was formed back in the late Forties. It started as a rag-chew group, but W6BPT kept reporting in with traffic, and eventually it became a traffic net primarily. It was officially unveiled as a net on December 5, 1949, meeting three times per week on 3860 kc. The net now meets daily at (yawn!) 0145 CST under the tutelage of W0BVL, who says their slogan is "To get your traffic delivered, put it on the Early Bird. They always come through."

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Another transcontinental net which is trying to get started is the Transcontinental C.W. Net (TCWN). W4BMY is doing the ramrodding on this one, and trying to do on c.w. what the Early Bird Net is trying to do on 'phone — take advantage of early morning conditions to get that traffic through. TCWN meets at 0500 EST on 3690, Monday through Saturday. W4BMY says that his greatest ambition is to get a QNI from every state in the union some morning.

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W4UWA reports a Christmas Overflow Net operating on 3525 kc. daily at 0600 CST to handle overflow traffic during the Christmas season. This net met 11 times, handled 149 messages. It was open to all comers, and had representation from the following states: Tenn., Ill., Conn., N. Y., Ind., Ga., N. J., Nebr., Pa., Vt. and Mich. W4UWA suggests a regular NTS overflow net to operate in the mornings to handle traffic left over from the previous night's operation.

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National Traffic System. We quote a short but pertinent paragraph from a bulletin by W6ZRJ, manager of the Central Valley Net (NTS section-level, San Joaquin Valley and Sacramento Valley Sections): "There are three main categories of c.w. traffic men: the iron man, the one-night-a-

week man and the occasional check-in. . . . Whatever type you feel you are, we would like you to know that there is a place in NTS and CVN for you. Without iron men, long-haul work would slow down. Without many fellows who will take one or two nights a week as NCS and be there on those nights, our nets would soon start missing sessions. But without the large amount of stations who check in only once in a while we would not have enough stations to have a net each night. Everyone is needed; everyone is welcome."

Our sentiments exactly. NTS is not a system designed for one group or one type of operator; it is designed for all who wish to participate. The only requirement in participation is this: remember that NTS has all types of operators. If the presence of types different from you (faster, slower, different modes, differing opinions, etc.) irks you, it is not the fault of NTS. We don't work by ourselves; we work together. We hope you will accept this principle, because it is one most necessary for success in any organization.

### December reports:

Net	Ses-sions	Traffic	Rate	Aver-age	Repre-sentation
1RN	22*	386	0.44	17.5	86%
2RN	41	229	0.40	5.3	90
3RN	42	324	0.54	7.7	75
4RN	46	307	p.56	7	41
RN5	49	1478	0.72	30.2	73
RN6	54	400		7.4	
RN7	32	209		6.5	43
SRN	40	253	0.51	6.3	70
TEN	67	3770		56.3	68
TRN	49	136	0.28	2.8	66
EAN	21	965	1.52	46	98
CAN	23	1466		63.7	99
PAN	30	2159	1.06	71.9	93
TCC-East		276			
TCC-Central		53			
TCC-Pacific		522			
Sections**	386	3259			
Summary	892	16,192	EAN	18.0	CAN
Record	892	16,192	1.52	23.5	

\* Out of 27 sessions held

\*\* Sections reported: QKS/QKS-SS (Kans.); CN (Conn.); TLCN (Iowa); AENB & AENP (Ala.); SCN (So. Calif.); Tenn. Sectional, Tenn. Practice and Tenn. Hi-Speed; WSN (Wash.); KYN (Ky.); MSN CW & MSN Fone (Minn.).

### Late Reports:

3RN (Nov.)	31	224	0.37	7.2	88%
NCN (Calif.) (Nov.)	20	104			

We continue to topple records. December traffic on NTS topped all previous records, the nearest being last year's 14,833. Net sessions increased from last year's 607, resulting in the decrease in the average-per-session noted.

Net notes: "Skip" played havoc with 1RN in December. W3ONB would like to have someone volunteer to take over 3RN. RN5 has been handling a record-breaking amount of traffic, and W4OGG has issued several fine RN5 Bulletins; representation from Southern Texas is badly needed. VE7ASR reports bad conditions greatly hampered RN7 operations during December, and NCS often fail to report; representation needed from Saskatchewan and Alaska. TEN's early session (1700 CST) handles much more traffic than either of the others. VE3GI reports a new net, the Northland Net, now represented on TRN by VE3AVS. Four out of six regions had perfect attendance on EAN during December. W9JUI is still looking for Saturday night NCS for CAN. PAN certificates have been issued to K6BGM and W7APE.

Transcontinental Corps: All three TCC Directors are struggling to keep the TCC roster full in the face of constant turnover brought about by failure of some stations to make contact with their counterpart schedules. Erratic conditions have not helped any. In the Eastern Area there are some vacancies which can be filled by application to Eastern Area Director W8UPB. Stations that can make contact with the West Coast regularly are needed. Being able to operate rather late hours would be helpful, too. In the Central Area, W9SCA and W9BDR are running the TCC schedules almost singlehanded. Out in the Pacific Area, W6HC has had his hands full trying to keep vacancies filled. Honorable mention goes to W6ADV, W6YHM and

K0WBB. The complete TCC roster as of mid-January, 1955: Eastern Area — W1AW WIEMG W1N1M W2RUF W2ZVW W3COK W4ZFY W5DQG W8FYO VE3AJR VE3BJV VE3GI VE3TM VE3VZ. Central Area — W9JUL, W9RXD W8SCA W6BDR. Pacific Area — W4Y1P/6 W6ADB W6IPW W6QPY W6UTV W6YHM W7CCL W0BEN W0CYT W0KQD W0KHQ W0EKQ K0WBB.

## A.R.R.L. ACTIVITIES CALENDAR

Mar. 5th: CP Qualifying Run — W6OWP  
 Mar. 11th-13th: DX Competition (phone)  
 Mar. 15th: CP Qualifying Run — W1AW  
 Mar. 25th-27th: DX Competition (c.w.)  
 Apr. 1st: CP Qualifying Run — W6OWP  
 Apr. 13th: CP Qualifying Run — W1AW  
 Apr. 16th-17th: CD QSO Party (c.w.)  
 Apr. 23rd-24th: CD QSO Party (phone)  
 May 7th: CP Qualifying Run — W6OWP  
 May 12th: CP Qualifying Run — W1AW  
 June 3rd: CP Qualifying Run — W6OWP  
 June 11th-12th: V.H.F. QSO Party  
 June 17th: CP Qualifying Run — W1AW  
 June 25th-26th: ARRL Field Day  
 July 2nd: CP Qualifying Run — W6OWP  
 July 11th: CP Qualifying Run — W1AW  
 July 16th-17th: CD QSO Party (c.w.)  
 July 23rd-24th: CD QSO Party (phone)

## SUPPLEMENT TO NET DIRECTORY

The following list of nets will supplement and correct the listings on page 78, Nov. 1954 *QST*, and page 74, Jan. 1955 *QST*. Please inform us promptly of any errors or omissions so that they can be included in the final May *QST* installment. An asterisk (\*) indicates correction from previous listing; otherwise, the listing is of a net not previously included. This listing can also be used to correct and bring up to date information in the cross-indexed ARRL Net Directory, available free upon request.

Nets registered subsequent to Jan. 18, 1955, will be included in the next supplementary list, in May 1955 *QST*.

Name of Net	Freq.	Time	Days
Ala. Emerg. Net (Phone) (AENP)	3955	1800 CST	Daily
Arizona Net *	3685	1900 MST	Tue., Thu.
Ark. Emerg. 'Phone Net	3885	0600 CST	Mon.
Braintree (Mass.) Civil Defense Net	28,560	2100 EST	Mon.
Bristol (Va.) Amateur Red Cross Emerg. Net	1815	1930 EST	Mon., Wed., Fri.
Broward Emerg. Net (Fla.) (BEN)	29,400	1415 EST	Sun.
Buzzards Roost Net (Mich.) (BR)	3930	1730 EST	Mon.-Fri.
Calumet Area (Ind.) Emerg. Net (CAEN)	1805	1900 CST	Mon.-Fri.
Cape Cod and Island Net	3912	0745 EST	Mon.-Sat.
Caravan Club Mobile Emerg. Net (Texas)	3995	1300 CST	Sun.
Chattanooga Amateur Radio Emerg. Net	29,600	1700 EST	Sun.
Conn. Training Net (CTN)	3640	0900 EST	Sun.
Cranston (R. I.) Civil Emerg. Net *	29,520	2000 EST	2/4 Thu.
Doghhouse Net	3560	1800 EST	Mon.
Du Page Co. (Ill.) Civil Emerg. Net	29,600	2000 CST	Mon.
East Coast Net	3595	2000 EST	Mon., Wed., Fri.
Eastern Pa. Emerg. Net	3610	2000 EST	Mon.
Eastern Pa. Net	3610	1830 EST	Mon.-Sat.
Eastern Pa. CD Net (c.w.)	3503	5 0830 EST	Sun.
Eastern Pa. CD Net ('phone)	3915	0830 EST	Sun.
Edmonton (Alta.) Mutual Aid Area Net	3765	0900 MST	Sun.
El Paso Ten-Meter Emerg. Net	29,640	1930 MST	Mon.
FARM Net	3935	1830 MST	Mon.-Fri.
Finger Lakes Net (N. Y.)	145,350	2000 EST	Fri.
Fla. Emerg. 'Phone Net (FEPN)	3910	1815 EST	Tue.
Fourth Regional Net (4RN)	3547	1945 EST	Mon.-Fri.

Gem Net (Idaho)	3638	2000 MST	Mon., Wed., Fri.
General School Traffic Net	3735	1630 CST	Mon.-Fri.
Indiana Fone Net (IFN) *	3910	0900 CST	Daily
		1700 CST	Mon.-Fri.
Iowa 75-Meter 'Phone Net	3970	1230 CST	Mon.-Sat.
Jefferson Parish (La.) Civil Defense Net	29,100	1900 CST	Wed.
Kankakee-Iroquois AREC Net (Ill.)	3920	1200 CST	Mon.-Sat.
Lake Erie Network (Pa.)	29,150	1315 EST	Sun.
Lakeland Emerg. Net (N. J.)	147,150	2100 EST	Mon.-Fri.
Lee Co. (Ala.) Emerg. Net	3855	1330 CST	Sun.
Lid Knockers Net	3725	0800 EST	Sun.
Manitoba C.W. Net (MAN) *	3700	1900 CST	Mon., Wed., Fri.
McKean Co. (Pa.) Emerg. Net	3525	0900 EST	Sun.
Medina Co. (Ohio) Emerg. Net	1905	1330 EST	Sun.
Memphis Ten-Meter Mobile Emerg. Net	29,627	1900 CST	Mon.-Fri.
Memphis Two-Meter A.M. Net	145,350	2000 CST	Wed.
Memphis Two Meter F.M. Net	145,500	1930 CST	Mon.
Mesaabi Range Net ('Minn.)	1905	1900 EST	Mon.-Fri.
Middlesex Co. (N. J.) Emerg. Two-Meter Net	147,180	1930 EST	Wed.
Minn. 'Phone Net	3820	1205 CST	Mon.-Sat.
		0900 CST	Sun., Hol.
Morning Conn. Net (MCN)	3640	0645 EST	Mon.-Sat.
Morons of the Megacycles (Fla.)	29,560	0915 EST	Sun.
Muskingum Emerg. Net (Ohio)	29,616	2200 EST	Fri.
Nebraska C.W. Net *	3535	1845 CST	Daily
Nebr. 75-Meter Emerg. 'Phone	3983	1230 CST	Daily
New Brunswick Amateur Radio Assn. Net	3750	1000 EST	Sun.
New Jersey C.D. C.W. Net	3505 5	1900 EST	Sun.
N. Y. State Civil Defense Command Net	3993	0900 EST	Sun.
New York C.D. Net (RACES)	3509 5	0900 EST	Sun.
Northern Calif. Net (NCN)	3635	2030 PST	Mon.-Fri.
Northern District C.D. Net (Md.)	29,510	1930 EST	Tue.
	147,180	2030 EST	
Northern Va. Emerg. Net (NVEN)	29,200	1330 EST	Sun.
Northland Teen-Age Net	3870	1330 EST	Sun.
Ont. Restricted-Speed Net (RSN)	3645	1300 EST	Sun.
Ore. State Net (OSN) *	3585	1830 PST	Mon.-Sat.
Oswego Co. (N. Y.) C.D. Net	145,150	0900 EST	Sun.
Pine Tree Net (Me.)	3596	1900 EST	Mon., Wed., Fri.
Polecat Net	3850	1215 CST	Mon.-Sat.
Pony Express Net	3920	0700 PST	Daily
		0900 PST	Sun.
Quebec Emerg. Net (QEN)	7160	1030 EST	Sun.
Queen City Emerg. Net (Ohio)	29,610	2000 EST	Mon.
Radio Amateur Club of Belleville, N. J., Net	2,600	0930 EST	Sun.
	147,240	0945 EST	Sun.
Region V Sector III C.D. Net (Mass.)	29,460	1930 EST	1st Mon.
Red Jacket Mobile Net (N. Y.)	28,730	1000 EST	Sun.
River Forecast Net (QRFN)	3725	2200 CST	Mon.
RTTY Net (Calif.)	147,850	2000 PST	Tue.
San Antonio Radio Club Emerg. Net	3855	1800 CST	Thu.
San Bernardino Area Net (Calif.)	29,200	1900 PST	Mon.
San Francisco Section Net	145,350	2000 PST	Alt. Mon.
Schenectady Emerg. Communications Net (N. Y.)	3950	1400 EST	Sun.
Sixth Regional Net (RN6) *	3615	1945 PST	Mon.-Fri.
		2130 PST	Mon.-Sat.
South Carolina Emerg. Net	3930	1930 EST	Mon.-Fri.
		0830 EST	Sun.
		1530 EST	Sun.
South Carolina Mobile Round-up	3930	1400 EST	Sun.
South Carolina 'Phone Net	3930	1930 EST	Mon.-Fri.
		0830 EST	Sun.
		1530 EST	Sun.
South Dakota C.W. Net *	3645	1900 CST	Mon., Wed., Fri.
So. Dak. 75-'Phone Net	3870	1830 CST	Mon.-Sat.
		0930 CST	Sun., Hol.
Springfield Area (Mo.) Net (SAN)	3720	0800 CST	1/3 Sun.

(Continued on following page)

Tenth Regional Net (TEN)*	3545	1700 CST	Mon.-Sat.	Wisc. School Novice Net	3735	1215 CST	Mon.-Fri.
		1945 CST	Mon.-Fri.	Wood-Ridge, N. J., C.D.	145,680	1945 EST	Wed.
		2130 CST		Emerg. Net			
Third Regional Net (3RN)*	3590	1830 EST	Mon.-Fri.	Yonkers (N. Y.) AREC Net	28,730	2030 EST	Mon.
	1945	EST		YLRL	3900	2000 EST	Wed.
Thirteenth Regional Net (TRN)	3675	1945 EST	Mon.-Sat.				
	2130	EST					
Toronto Amateur Six-Meter	51,000	2000 EST	Tue.				
Emerg. Net (TASMEN)							
Transcontinental C.W. Net	3690	0500 EST	Mon.-Sat.				
Tropical Phone Tie Net	3915	1730 EST	Mon.-Sat.				
(TPTN)*							
29,520 Net	29,520	2000 CST	Tue.				
Twin City (Ill.) Emerg.	28,560	2100 CST	Tue., Thu.				
Net (TCEN)	29,640						
USCG Auxiliary 1st Dist.	3511	1100 EST	Sun.				
Net	3525						
Vermont Phone Net	3860	0930 EST	Sun.				
Wash. Section Net (WSN)*	1988	1930 PST	Mon.-Fri.				
	3575	1900 PST					
West Virginia Phone Net	3890	1830 EST	Mon.-Fri.				
Westfield (Mass.) RACES Net	29,640	2000 EST	Mon.				
Win-Jammers Net	3948	0800 PST	Daily				
Wisn. Educator's Phone Net	3850	1000 CST	Sat.				
		1530 CST	2 4 Fri.				

## BRIEFS

Mr. W. K. Neville, jr., Racing Chairman, First International Cup Regatta, staged October 2nd and 3rd at Elizabeth City, N. C., highly commends the Tidewater Mobile Radio Club (Norfolk, Va.) for their part in furnishing communications during the event. A number of messages were handled between the committee boat, the U. S. Coast Guard, the Pasquotank River Yacht Club, and the various pits and places of importance. Those participating included W4s YVG RGZ MLD ZKA OGN PAK IPA SVT DHZ LCW RRA ULL PWX FOU ZCY SYO JZQ IND, W6TOR and W9GLR.

A description of the 12-watt Field Day transmitter at W2NL1/2 (Dec. QST, page 46) ended up like this: "The complete station, except for batteries, was placed on a 20 by 36 foot operating table, with room to spare." As W0SGG points out, it just shows that careful planning and miniature components can produce!

## BRASS POUNDERS LEAGUE

### Winners of BPL Certificates for December Traffic:

Call	Orig.	Recd.	Rel.	Del.	Total	Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL.....	421	3874	2834	963	8092	W6CMN.....	18	271	68	203	560
W3WIC.....	956	2402	2271	306	5935	W9QQG.....	21	260	167	90	538
W9JTC.....	19	1666	1515	96	3296	W1UKO.....	14	260	235	21	530
W0BSC.....	6	1635	1608	2	3271	W4TUT.....	7	266	244	10	527
W0BDR.....	5	1584	1535	32	3156	W5BKH.....	6	251	215	42	514
W0CPI.....	12	1195	1075	120	2402	W6ZRJ.....	22	235	245	12	514
W0TQD.....	6	1171	1158	13	2348	W8QAJ.....	158	177	171	6	512
W5MIN.....	30	1154	856	286	2326	W3CVE.....	171	169	38	131	509
W9DNO.....	17	1135	1007	143	2304	W8NUL.....	12	279	211	7	509
W7BA.....	27	1138	1115	23	2303	W7VAZ.....	20	244	171	73	508
W4PFC.....	15	1119	1108	5	2247						
K6FCZ.....	165	1040	970	70	2245						
K6FAE.....	51	1058	1063	34	2206						
W2KEB.....	101	1198	358	440	2097						
W9VBZ.....	245	903	840	65	2053						
KA2FTC.....	673	690	965	122	2050						
W4PL.....	6	1004	898	86	1994						
W7PGY.....	27	959	925	34	1945						
W7APE.....	15	832	828	4	1679						
W4YIP/6.....	5	805	265	540	1615						
W2KEV.....	46	882	440	240	1608						
W4OGG.....	10	750	700	66	1556						
W5QDF/6.....	8	728	693	35	1464						
W3WV.....	42	755	470	132	1399						
W0KQD.....	110	622	580	22	1334						
K1WAB.....	583	373	366	7	1329						
W0BLI.....	11	657	646	6	1320						
W2RFL.....	108	416	113	113	782						
W9NZZ.....	370	384	0	378	1132						
K5FFB.....	199	417	429	49	1094						
K6FCY.....	147	448	368	80	1043						
W0GAR.....	15	500	508	7	1030						
W2LPI.....	37	495	463	30	1025						
W5LYO.....	4	498	384	108	994						
W4UHA.....	127	403	415	5	950						
W0PZO.....	1	465	464	1	931						
W8ARO.....	26	452	265	183	926						
W4PU.....	24	446	305	141	916						
W2VNX.....	54	438	297	123	912						
W9T.....	10	414	429	9	892						
W2BO.....	142	327	357	2	828						
W6QPY.....	17	357	382	21	807						
KA2WW.....	300	280	208	42	800						
W6IZG.....	2	46	357	383	788						
W0YGB.....	5	385	390	2	782						
W4WOC.....	30	375	366	9	780						
K2CQP.....	36	355	330	24	775						
W0LCX.....	7	376	376	7	766						
W6LYG.....	16	362	80	282	740						
W6QMO.....	110	342	129	129	710						
K4ZHQ.....	284	212	68	144	708						
W2JOA.....	82	345	238	41	706						
K4DVR.....	599	18	70	12	699						
W9WWJ.....	101	242	302	41	686						
W6PHT.....	13	329	255	71	668						
W7JHA.....	1	340	326	1	668						
W1KMO.....	2	327	269	56	656						
W1KRR.....	6	332	283	31	652						
W6YHM.....	11	322	269	50	652						
W4COU.....	4	326	197	119	646						
W9TQP.....	16	305	267	54	642						
W6FLQ.....	7	306	236	77	626						
W4WXB.....	2	293	274	32	612						
W11B7.....	20	293	287	6	605						
W4BMY.....	25	281	276	24	605						
K2EUN.....	21	291	270	20	602						
W3HFF.....	5	296	280	16	597						
KANAB.....	118	234	173	61	586						
W0WY.....	7	257	247	7	507						
W8QHW.....	12	276	246	28	562						

### More-Than-One-Originator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6TAB.....	107	4243	2643	1600	8593
KA7SL.....	4210	407	117	290	5024
K0PDX.....	45	2354	2399	23	4821
W6BBD.....	143	1542	1500	42	3227
W6JDK.....	40	1593	897	626	3016
KR0KS.....	667	958	781	177	2583
K0WBB.....	56	1253	1156	64	2529
KA7LJ.....	1646	383	293	90	2412
K0AIR.....	36	1121	1051	71	2279
K4EDY.....	30	987	857	23	1897
KA2GE.....	178	778	692	86	1734
KA2AK.....	616	503	452	51	1622
K6FDG.....	76	609	538	71	1294
K4WAR.....	190	216	343	82	831
K7FAE.....	23	333	349	24	729
K3WBJ.....	49	204	219	34	506

### More-Than-One-Originator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W0KA.....	262	W8SWG	137	W48VG	106
W0WMA.....	222	W1LYL	136	W4ZJY	105
KA7HI.....	221	W2MYM	135	W9CXY	105
W0GAH.....	214	W0KLG	132	W0GBJ	105
W9AA.....	209	W3PKC	131	W4WXL	104
W0FLN.....	191	W0PQB	127	W0IUF	104
W0IJS.....	186	K6EA/0	120	W6FEA	103
W4BYE.....	178	W1WTG	119	W1YYM	102
W6USY.....	159	W08SG	118	W5NDV	102
W5UBW.....	157	W1WCC	116	W7QKU	102
W3RV.....	149	W0GB	116	K2HZR	101
K1PFC.....	142	W2JGV	114		
VE1FP.....	139	W8RO	114	W8IQJ/9(Nov.)	230
W6BHG.....	138	W1BDI	113	W4YRN (Nov.)	107
W8HNP.....	138	W0NYI	109	*W4UHA (Nov.)	104
W8NOH.....	138	W4UWA	107	W1CDX (Nov.)	102

### More-Than-One-Originator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
KA2USA.....	245	W9USA	150	W9GEY	124
W2AEE.....	162	K1WAV	135	W8WKO	104

BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: W1UKO, W3WV, W5TFB, W6CMN, W8ELW, VE3NG.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U.S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies, within 48 hours of receipt, in standard ARRL form.

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

## ATLANTIC DIVISION

**EASTERN PENNSYLVANIA** — SCM, W. H. Wiand, W3BIP — SEC, 1GW, RM: AXA, PAM: PYF, E. Pa. Nets: 3610, 3850 kc. The York Road RC of Elkins Park held its Third Annual Christmas Party on Dec. 21st. An enjoyable time was had by all members and their families, with a total of 90 persons attending. SAO's XYL was chairlady of the affair. The Club's officers for '55 are SAO, pres.; VMJ, vice-pres.; UZF, treas.; YCL, rec. secy.; ULC, corr. secy. The Car-Le RC elected the following officers for '55: HA, pres.; UEU, vice-pres.; AIW, secy.-treas.; WJY, act. mgr. The Pottstown ARA elected ARK, pres.; FXX, vice-pres.; DUV, secy.; YDY, treas.; HOG, act. mgr. PYF reports the Del-Lehigh ARC set up a 50-watt 'phone rig on 3910 kc. at the bedside of K2CCN, a Lehigh University student stricken with polio and confined to the polio ward of St. Lukes Hospital in Bethlehem. WNS 3AQI and AQM, a brother team, with dad, NNV, their teacher, received their Novice tickets in December. AQI, reports dad, is now stationed at Sampson AFB and will attend radar school upon completing basic training. The Anthracite Net (AN) is looking for more members. If you have never handled traffic and would like to get started AN will give you fine experience. Listen for CQ AN Mon. through Fri. on 3610 kc. at 1900 EST. CUL reports the new home and new rig almost completed. UOE has 29 countries worked on 80 meters with 80 watts input. ARK and TYW are newly-appointed OOs, while YAZ is the first ORS appointee of '55. Traffic: (Dec.) W3CUL 8092, BFF 597, OZV 307, VVV 244, WUE 170, QLZ 162, TEJ 161, DUL 119, UKJ 107, UOE 103, RSC 98, GES 91, OK 51, GYI 42, YGX 41, ELI 14, PYY 13, ADE 6. (Nov.) W3NOK 126, GES 61, UOE 42, OK 26, PYY 15, ABT 2.

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA** — Arthur W. Plummer, W3EQK — On Mar. 21st my term of office as SCM will expire. It has been a most interesting two years and thanks to all of you who have helped to make my work satisfactory. KLA says there is increasing interest in 220 Mc. around Baltimore. RV reports completing a Heathkit 5' scope and VTVM. JE reports WBP, Md. State Civil Defense station, is on the air each Sun. from 1400 to 1600. Visitors are welcome. JZY has 60 countries confirmed out of 97 worked. Andy is using a vertical on 20 as well as on 80-meter c.w. BKE is back on the air with his well-known call (formerly QQS in D. C.). The new Baltimore Midnight Ragchewing Net meets Sat. night on 10 meters. LXG, JLY, HWZ, PRL, and SG have been heard. TMZ is on the air with a 4-125A parking, a new 140X, with DB-23 preselector, and a three-element 20-meter wide-spaced beam. CDQ participated in the YLRL Contest. QCB is now OO Class 1. UE is NCS on 3RN on Wed. in addition to NCS on MDD on Mon. and Thurs. MCG made 89,750 points in the SS Contest with a bad voltage regulator giving only half voltage. TGF popped 6 byrass condensers in his receiver. WKB has new vertical working on 80, 75, 40, and 20 meters. EEB has joined the ranks of OO Class 1. TMZ reports 67,500 points in the October CD Party. LDD, Havre de Grace, reports plans afoot to install a Viking II and a good receiver in the Sheriff's Office in Bel Air and to operate the control center from that location. RMY is going to high-power and SZY is looking for a good home receiver. 5ZOG is moving into a new shack in Aberdeen. Attention all hams in and near and passing by and through Harford County: Check in on 29,590 kc. each Mon. at 8:00 p.m. AYS's Florida vacation and a sick spell didn't hurt his score in the W-Ve Contest, for which he received a nice certificate for winning in Md.-Del.-D. C. Bayard finally made WAC on 'phone with a QSL from 4X4BL. MCG reports he is NCS for 3RN on Fri. nights. The PYRC hopes its score in the last SS beats FRC. The Oxen Hill contingency is composed of HVM, KDP, IKN, WV,

MFJ, and MCG. They all live within a radius of about 2½ miles and none of their scores were under 60,000. During Christmas week and continuing through Christmas Day holiday traffic was handled through the SCM in conjunction with Frank Cross, Director, and Robert Potts, Asst. Director, Baltimore Office USO, to service personnel anywhere in the world. Messages were filed at the USO office, delivered to EQK, who in turn relayed them to HXN, PKC, and WMX. The Washington Mobile Radio Club has a booklet for out-of-town hams visiting Washington D. C. containing all types of ham radio information. It is free by writing Ethel Smith, W3MSU, 177 Joliet Street, S. W., Washington 24, D. C. The BARC has completed the necessary paper work relative to modification of the station license from PSG to FT in memory of Meyer (Sam) Grossman, a charter member who died in 1954. FPQ is taking part in the affairs of PVRN and USWB. There is a BC-610, HRO-60, and three-element beam operating at the Army Medical Center. Walter Reed Hospital, Washington, D. C., as K3WBJ/MARS-WRAMC. WV received a BPL Medallion. NNX is renewing beam mast as the result of "Hazel" damage. CVE reports heavy traffic for December. MDD now operates at 7:15 p.m. EST on 3650 kc. HKS reports after 3 months of inactivity. RMY now has 10-meter equipment mobile and fixed. LZM talked on "Iiams and Civil Defense in Baltimore County" at the Jan. 10th meeting of the Chesapeake Club. Traffic: (Dec.) W3WV 1399, CVE 509, K3WBJ 506, W3PKC 305, UE 278, RV 205, ONB 171, COK 123, FPQ 26, WIF 23, JZY 17, JE 10, NNX 4. (Nov.) W3UE 64, JE 40, MCG 30, NNX 10, EEB 8, JZY 8, TGF 6, WSE/3 5.

**SOUTHERN NEW JERSEY** — SCM, Herbert C. Brooks, K2BG — PAM: ZI. Effective Jan. 1st, JRO became an Official Bulletin Station and K2HZR an Official Relay Station. EZM, Maple Shade, is doing FB with a new 40-meter vertical, KN2JAV and K2WAU are heard regularly on 2 meters handling Fort Dix traffic. CEH has a new beam on 2 meters. SDP edits the DX column for the SJRA. Give Bill your support and keep him informed on your DX activities. The SJRA Christmas Party was a big success. ASG reports heavy holiday traffic. Doc is quite active in MARS. ZI reports the N. J. 75-meter 'Phone Net is off to a good start this year with many new members. BAY has completed all antenna repairs and can now QSY any band from 2 to 160 meters. HX, HICR, and K2CLD have made repairs to the 20-meter beam at ZQ. The DYRA is planning an Old Timers Nite in Trenton on April 23rd. Contact ZI for details. MOM is recovering from a serious illness. ORA has just returned from California. Joe makes regular reports on OES activity and keeps us posted on the 6-meter Net that meets each Mon. at 2030. The Net has been in operation for several years. The Hamilton Twp. paper, *Scuttlebut*, reports antenna-building or changing by CEH, RLY, LSS, BDA, and K2BNE. LS and VMX are doing fine jobs as Official Observers, reporting many discrepancies. The Burlington County Radio Club meets the first Fri. of each month and operates under the call K2KED. Traffic: W2RG 231, K2HIZR 133, W2ASG 76, K2BGC 38, W2ZI 31, YRW 13.

**WESTERN NEW YORK** — SCM, Edward G. Graf, W2SJY — Asst. SCM: Jeanne Walker, 2BTB, SEC: UTH/ FRL, RM: RUF, PAMs: GSS, NAL, NYS meets on 3615 kc. at 6:30 and 3925 kc. at 7 p.m.; NYSS on 3595 kc. at 8 p.m.; NYS C.D. on 3509.5 and 3993 kc. at 9 a.m. Sun.; TCPN 2nd call area on 3970 kc. at 7 p.m.; SRPN on 3970 kc. at 10 a.m.; ISN on 3980 kc. at 3 p.m. The RARA reports plenty of new 220-Mc. equipment under construction for the V.H.F. SS. This club mails some 6,000 pieces of mail to area amateurs each year. While Secretary RUJ was hospitalized, PSD brought Bob his own Viking and VFO to help pass the time. The RAWNY ran a WAS Contest 7-day affair in January; two sections, one for Novice, one for General Class. The KBT RC had its Monti Cadlo Nite Dec. 13th. RUT just buried 500 ft. copper ground radials for a new antenna. OLH/GSB has a new VFO; operates at GSB. APH (Owego) is a new member of NYS. K2DYB requests a note from all W.N.Y. hams who would like a W.N.Y. slow-speed c.w. traffic net on 80 meters. He had fun in the SS. RQF handled the most traffic daytime. CXM (7PRZ) keeps college net skeds and a weekly sked with 7ZU and is busy with finals. EMW worked 12 countries in December with 45 watts although was busy at the Post Office. RUF, net manager, says HKA won the award for the most valuable station on the net, while BXP and OE got awards for high attendance. Traffic: (Dec.) W2RUF 1278, OE 321, K2DYB 260, DJN 150, DSF 122, W2HKA 118, ZRC 98, RQF 86, DSS 54, CXM 40, RJJ 29, WS 27, K2CUQ 20,

W2FEB 17, K2DQ 14, W2EMW 2. (Nov.) K2DYB 106, DJN 45, W2WS 32, K2DG 5.

**WESTERN PENNSYLVANIA** — SCM, R. M. Heck, W3NCD — SEC: GEG, RMs: NUG and UHN. PAMs: AER and LXK/YKD. The WPA Traffic Net meets Mon. through Fri. at 7 p.m. on 3585 kc. From KWII of the Steel City ARC we learn that MTP is interested in s.s.b. YDP is trouble-shooting the receiver with the 40-meter net gang aiding. TVB is building a super VFO. 9CWLL, ex-DNO, recently was in Pittsburgh for the wedding of his daughter. CTN has a good 40-meter signal in the west. WIIY is increasing power to 400 watts. RSL is coming back to 40 meters with a Viking. The Washington County ARC still holds code classes. VFN is leaving for the Army. KIIY is getting results with B.&W. 135 watts. SUK reports his 2200 sked each Mon. night with STY is practically 100 per cent and now he is experimenting with phase modulation p.p. 4-65As 200 watts. VEM is working out fine with home-built VFO. The Bucktail ARC now has the club station, YDWF, equipped to operate 10 meters. NGZ is having transmitter trouble. LAO's antenna blew down. IIX built the Club 10-meter converter and worked a little in the SS. TYC was busy in the SS. WII is on 40-meter c.w. RMX and PTU are 10-meter mobile. TCP still is on test equipment projects. OGN is 75-meter mobile. RLH will be on 40-meter c.w. SUL is mobile. TMA is down for repairs. The Radio Assn. of Erie news is through the courtesy of QN. MMJ shows up on 10 meters with a Viking. TMK, LKJ, TLA, and STK participated in the Christmas Parade furnishing communications. Investigating 6 meters for emergency communications use are MED, LKJ, and KJM. NKK recently joined 6-meter activity. WSO acquired his General Class ticket. QMY is back on 10 meters. VNB has left for the Air Forces. New calls are WN3APB, WN3AQU, and WN3ALF, son of YWL, all of Girard. Going from Novice to General Class is ALD. Visiting RAE was IYDM/VO4. STK reports a new code class has started at the YMCA. QMY is on 10 meters. OIE has recovered from a recent accident. The Mercer County Radio Assn. conducts code classes weekly. Fourteen-year-old ZEW reports that he and 11-year-old ZEG are active on 80- and 40-meter c.w. Traffic: (Dec.) W3W1Q 5935, LXQ 200, LMM 191, KUN 190, QPQ 140, GJY 99, UHN 61, OEZ 52, UTR 47, VRZ 20, NUG 18, SIJ 18, KNQ 8, NMJ 5, NCD 4, ZEW 3. (Nov.) W3LXQ 82.

## CENTRAL DIVISION

**ILLINOIS** — SCM, George Schreiber, W9YIX — Section Nets: ILN (c.w. 3515 kc.), IEN (phone 3940 kc.). SEC: HOA. RMs: BUK and MRQ. PAM: UQT. Cook County ECT: HPG. New officers of the Chicago Area Radio Club Council are HPG, KCW, SPT, and GME. Leading the Starved Rock Radio Club are ZEN, TV, and QLZ. The Chicago Suburban Radio Assn. elected DDP, YGF, PVE, and SDN. MRT heads the Central Illinois Radio Club. Other officers are SXL and a run off for veep between OUF and QGX, who tied. Congrats to SH and his wife on the arrival of Raymond Allen the day they bought a new home. New members of the A-1 Operators Club are LZ and HPI. New OES and OBS is PRN. JMG now is OBS; he also holds ORS and OPS appointments. Ev is continuing his experiments to see what really low power can do. He uses 15 watts. ABS now fishes for his DX from Sterling and CGP from Pontiac. Both are operators for Illinois State Police. ZSN, also a State operator, resigned to go into the service business. BRD and ROE exchange ideas on the life and habits of transmitting loops. One or the other is bound to come up soon with the apartment-dweller's dream. BPP tells us KSN is the new judge in Cumberland County. USI renewed his OBS appointment, LMC his ORS, and IAW his OPS. Winners in the Chicago Suburban Radio Assn. Sweepstakes were WFS with 106,920 points, and PBM with 15,457. Five clubs participated, with CSRA topping the list. Others were YLRL, CRTA, North Suburban, and Hamfesters. New calls heard in the section are Novices MRZ, KAM, MAJ, LSN, and LSO. The last two are the 14- and 11-year-old sons of KRH. A new call heard on ILN is NPC, whose traffic total appears for the first time at the end of this column. Brass Pounders certificates went out to DO, QQG, and AA in December. Incidentally we reported QQG's traffic total last month under QGG. Sorry, John. PVK is radio training officer for the Coast Guard auxiliary and got a nice break from the newspapers on his idea of using the extension ladders of the Chicago Fire Department for emergency antenna towers. OR and BRD also have been mentioned in the public prints in a laudatory manner. DRN reports good activity on 220 Mc. and now is trying to get a converter going on 430 Mc. as his transmitter works out OK. BA and KFX used their mobiles to provide transportation and communications for the Cerebral Palsy Drive in their home town. CLH qualified for 20-w.p.m. sticker on his Code Proficiency certificate. KJ built the kilowatt and had to hire movers to get it off the work bench and upstairs to the shack. JO is jammed with ham receivers he is servicing. The code and theory class of the Quarter Century Wireless Operators Assn. is going great guns, sparked by LZ, CYD, and EVA. The

latter makes speeches to the would-be hams on what a terrible thing a nuke is to own and operate. The class has qualified fifteen Novices in six weeks. Keep up the good work, fellows. To holders of ORS certificates, we are going through the files and cancelling out-of-date appointments. How about sending yours in for renewal? Traffic: (Dec.) W9DO 2304, QQG 538, AA 428, USA 382, YIX 131, MRQ 86, VHD 78, LMC 62, CEE 58, NPC 40, SME 39, LXJ 31, SXL 31, STZ 16, BUK 14, BA 12, CLH 9, FRP 8, VBV 5, PHE 2. (Nov.) W9QQG 98.

**INDIANA** — SCM, George H. Graue, W9BKJ — The new net manager for IFN is YEO. IFN now meets at 1730 CST because of skip. QIN is considering a change for the same reason. NTA reports for IFN, 54 sessions and a traffic total of 383. The Indianapolis Club had a display at the hobby show showing kits for Novices. MZE now is DLACT. QAV has gone mobile. BBM mobilized to Florida, likewise FMJ. Officers of the TARS are DGA, pres.; UMS, vice-pres.; OVB, secy.; and RBV, treas. LBD and WQC have gone mobile. N9LVL has a Viking II. AUS has a Viking Ranger, likewise UDD. N9LDB is new in Elwood. N9LRB is new in Alexandria. Elected officers of the LCARC are PAS, pres.; MNO, vice-pres.; KRJ, secy.; MIF, treas.; and WKN, trustee. Uent has a Viking II. EIUU is erecting a 20-meter beam. YFD has a vertical antenna. HRH is building an all-band rig. NCARA's newly-elected officers are NTI, pres.; PPD, vice-pres.; and SQW, secy.-treas. N9LJG is new in New Castle. ZSC is organizing for c.d. N9IMO took the Technician Class exams; he has erected a 32-element beam. IDT is new in Warsaw. LMM is new in Mentone. BOS acquired a General Class ticket. ZYO, ELJ, EUC, UVD, ZVS, JBQ, and VZF are on 147.3 Mc. at New Albany. HRY is the club station of the CCRC. NZZ has a commercial radiotelephone first-class license. HTC is active on 40 meters. CEA is building 2-meter portable. HLY made CP 30. DKR has a pair of 4-65As on the air. SKP is using a Windom antenna. FGX has a new VFO. KLR has 3/4 kw. on 147.3 Mc. UKG is using 300 watts with a beam on 14 Mc. Traffic: (Dec.) W9JUI 3296, NZZ 1132, TT 892, UQP 642, SNT 452, WRO 332, GEY 251, W8IQJ/9 240, W9JBQ 232, SVL 187, EHZ 159, BKJ 124, ZRP 89, TG 84, DIJ 80, AQB 77, ZYK 76, VNV 71, YQC 66, QYQ 63, WUH 60, CMT 57, YIP 48, CC 47, CEA 46, NTA 45, CPT 36, HLY 30, STC 28, EGV 25, QR 24, KDV 23, ZIB 20, YVS 14, BDP 13, EQO 12, DKR 10, NH 6, PPS 6, SKP 6, FGX 4, PQA 3, GDL 2. (Nov.) W8IQJ/9 343.

**WISCONSIN** — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAMs: ESJ and GMY. RMs: IXA, RTP, and UNJ. Nets: BEN, 3950 kc., 6 p.m. daily; WIN, 3625 kc., 6 p.m. daily; WPN 3950 kc., 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile and c.d. frequency: 29,620 kc. CXY is the proud recipient of an ARRL Traffic Medallion. SZR has 19 countries on 3.5 Mc. with EL2, KM6, ON4, and SM the latest. CCO needs 4 more states for his WAS. RQK has new 14-Mc. "Short Beam." IQW is enthusiastic about s.s.b. YNO is building a 304TTL final. With new 75A-2 and 4-125A rig, NYS worked KM6 and KL7 on 80 meters. MQK has 136 countries worked and 123 confirmed, while KKK has 133 worked and 126 confirmed. MRAC officers are MDG, pres.; NLY and EKV, vice-pres.; VBZ, secy.; JPS, treas.; ONY board chairman; and RH, SNK, LSK, CUW, DR, and MOT, directors. New certificates (WPN) were issued to BCY, CFO, PZC, HBE, NYS, OVO, and YNO. YOX is mobile on 28 Mc. W9NFHT and W9NFJW are on 144 Mc. YRO uses a 75A-2 and a 32V-2. YOS keeps working 'em with 30 watts. The Point Radio Amateurs furnished an added mobile unit for the police on New Year's Eve with BCC, NNS, CFO, GHJ, and NIT participating. RKP worked FG7, PA0, and DL1 on 3.5 Mc. Results of the Dec. 12th Wisconsin Section QSO Party: 'Phone and c.w., 1st VBZ, 2nd RQM, 3rd NYS; 'phone only, 1st OVO, 2nd QNT, 3rd NUH; c.w. only, 1st RKP, 2nd WZL, 3rd YOS; mobile, 1st ONY, 2nd TKY, 3rd LUC. W9NFJW's new jr. operator was the first baby born in 1955 in Kenosha. LEE has resumed transmission of Official Bulletins on 144.12 Mc. at 1955 West and 2000 SE. OVO has a new Heath antenna impedance meter. IJU is chief at WHKW. PBB entered military service. FXA moved to Milwaukee. Traffic: (Dec.) W9VBZ 2053, WWJ 686, CXY 362, SZR 154, IXA 118, UNJ 102, CCO 68, FXA 53, UIM 45, RTP 36, GMY 30, RQK 28, IQW 27, AEM 22, SAA 20, RQM 18, YLE 16, OVO 6, IJU 3, VKR 2. (Nov.) W9WWJ 189, CXY 45, YLE 12.

## DAKOTA DIVISION

**NORTH DAKOTA** — SCM, Earl Kirkeby, W0HNV — DAO has a new HT-20. PHH has a complete new station and is planning to change QTH. The Red River Valley Amateur Radio Club at Fargo had a "Worked All Members" Contest recently. It sounds like a very good idea. Activities like that help a lot to keep a club active. PMZ has a new 75A-3. HNR drove to Watertown Jan. 9th. He had four other hams with him which added up to half a ton of hams! Traffic: W0FVG 78, EXO 56, UXO 24, IJNV 12, BFM 5, CAQ 4, EBA 3.

**SOUTH DAKOTA** — SCM, J. W. Sikorski, W0RRN —

(Continued on page 82)

## SELECTABLE SIDEBAND RECEIVERS

NORGAARD\* and McLaughlin\*\* each have developed practical methods of switchable side band selection for receivers. Norgaard's is the phasing type and McLaughlin's employs the principle of side band selection by changing the frequency of the conversion oscillator.

SINCE both of these methods have certain electrical merits, we at Hallcrafters have spent many engineering man hours carefully evaluating the two systems for incorporation of the better features of each into our products.

WITH a receiver having poor selectance ratio in the i.f. system, i.e. poor nose to skirt ratio, the phasing scheme has some merit as it can be easily attached as an outboard device. It may improve unwanted side band rejection by as much as 35 db; but this value is hard to hold in production and from a more practical standpoint 20 to 25 db. is realistic.

IF the two systems are compared on a cost basis for incorporation in a new receiver, the phasing method does not appear attractive as better side band rejection can be obtained at less cost with good tuned circuits.

MODERN receivers of better design from \$250.00 up are dual conversion primarily to reduce image responses. Dual conversion also makes practical 50 kc. i.f. systems with excellent selectance ratio that can further be readily adjusted for various degrees of bandwidth\*\*\*. It has been known for many years that the choice of conversion oscillator frequency will invert the side bands at the i.f. frequencies. However, McLaughlin was the first to apply this principle for side band selection when using an i.f. system adjusted to pass only one side band.

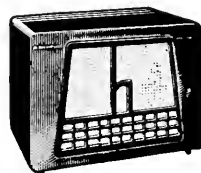
WITH a highly selective dual conversion receiver like the SX-96 wherein the i.f. pass band can be reduced to pass only one side band, it becomes very simple to add effective side band selection by choice of dual conversion frequencies. As the first i.f. is 1650 kc. and the second 50 kc., the second conversion oscillator may be either 1700 kc. or 1600 kc. Thus, if we switch in the 1600 kc. we pass the lower side band, and if we switch to 1700 kc. we pass the upper side band.

BY the addition of only a quartz crystal, some switch contacts and half of a dual triode, Hallcrafters is able to provide you with good, effective, selectable side band feature at a nominal cost.

*Bird Halligan, Jr.*

*W. J. Halligan W9AC*

for **hallicrafters**



\* QST, July, 1948

\*\* QST, October, 1947 and  
April, 1948

\*\*\* QST, June, 1954. SX-88  
(Recent Equipment)



## 75A-4 RECEIVER

The 75A-4 offers passband tuning, AVC for Single Sideband reception, a bridged T rejection notch filter, a crystal calibrator circuit, separate detectors for double or single sideband signals, a new noise limiter circuit that works equally well on SSB, AM or CW, and mounting provision for three separate Mechanical Filters. Retained are the time-proven features of the earlier 75A series — double-conversion, crystal-controlled first injection oscillator for high stability and good image rejection; permeability tuned, sealed master oscillator with accurate dial calibration and long-term stability, and Mechanical Filters in the IF circuits for maximum selectivity.



## 32W-1 EXCITER

Designed to meet the requirements of the most discriminating Amateur whether he operates SSB, AM or CW, the 32W-1 Exciter has sufficient output power to drive a high-level power amplifier stage, and together with the 75A-4 Receiver provides the basic needs for a completely engineered Amateur radio installation. Special features of the 32W-1 are dual conversion, a permeability tuned, hermetically sealed VFO, a Single Sideband generator using the Collins Mechanical Filter to provide optimum rejection of the unwanted sideband, RF feedback to assist in reduction of distortion products, selectable sidebands, bandswitching operation on all amateur bands from 3.5 to 30 mc, VOX or push-to-talk operation, AM operation with full carrier and one sideband being transmitted, CW operation with wave shaping for minimum key clicks and transients, FSK operation by using an external audio FSK oscillator, Automatic Load Control (ALC), and unitized construction.



# *Collins* PROUDLY ANNOUNCES a NEW STANDARD in AM, CW and SSB OPERATION

It took Collins to produce the first really new Amateur communication system, designed expressly for Single Sideband as well as AM and CW operation. Collins new 75A-4 Receiver/32W-1 Exciter or 75A-4 Receiver/KWS-1 Transmitter combinations are designed for the most exacting Amateur. Engineering-wise, the equipment meets the high standards Collins has set for military and commercial equipment. Price-wise, the Amateur will get more for his money than ever before. See your nearest Collins distributor for your brochure.

## KWS-1 TRANSMITTER

Collins engineering plus extensive on-the-air tests account for the KWS-1 Transmitter's reliability and optimum performance in SSB, AM and CW operation. The exciter and RF power amplifier are housed in a single receiver size cabinet. The Collins 367A-1 linear RF power amplifier uses two 4X150A's in class AB operation. RF feedback is employed to improve the linearity characteristics of the power amplifier. The KWS-1 incorporates circuit application and components which have been proved in preceding Collins equipment; to note a few, the 70E VFO, the Pi-L output network, extremely accurate VFO dial and the Collins Mechanical Filters. To meet the Amateur's future desire for power increase, Collins 32W-1 Exciter can be modified to a KWS-1 at the factory.



### COLLINS RADIO COMPANY

Cedar Rapids, Iowa

261 Madison Avenue, NEW YORK 16

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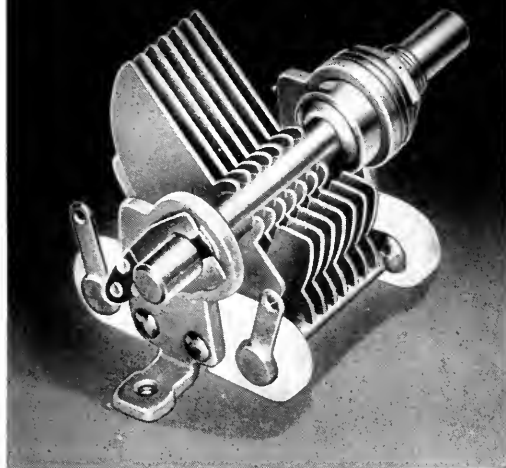
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Collins Radio Company of Canada Ltd.

74 Sparks Street, OTTAWA, ONTARIO



# "MC" CAPACITOR . . .



## Offers Wide Choice of Characteristics!

The "MC" is a versatile single-section tuning capacitor designed to give a choice of mountings, connections and capacity characteristics. The threaded brass front-bearing and tapped aluminum end-brackets permit panel or base mounting. A rotor stop permits 180° clockwise rotation for increasing capacity. For optimum performance all Hammarlund "MC" capacitors have silver-plated beryllium copper wiping contact, silicone-treated steatite insulation, soldered nickel-plated brass rotors and stators. The rotor shaft is supported on bearings at both front and rear of capacitor. "MC's" are available with capacities ranging from 5.5 mmf. to 320 mmf.



The Hammarlund Capacitor Catalog lists the complete line of standard capacitors sold by responsible dealers from coast to coast. For your free copy, write to The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1, New York. Ask for Bulletin C-3.

# HAMMARLUND

(Continued from page 78)

Asst. SCMs: Earl Shirley, 0YQR, and Martha Shirley, 0ZWL. SEC: GCP. RM: SMV. PAMs: BNA, GDE, PRL, and NEO. OOL and SDP have dropped the "N." A new Novice at Redfield is UYA. SIII is on the air from Onida. PRL and UVL have moved to new homes. RSP visited in Indiana during the holidays. NEO reports a new Elnac and Morrow FTR. The SFARC is conducting a 40-meter WAS Contest. While working on a new home, YQR fell, breaking his right arm. Bob Mitchell, ex-ISWX, and operator at KBFAL/FCR, now is FTEH and gives his QTH as Sac Zebra, SHAPE, APO 55, New York. LBS, collecting maritime mobiles on 15 meters, is up to 20. Net operations for December: 160-net, QNI, 876, 31 sessions, traffic "about 80;" c.w.-net, QNI, 90 in 14 sessions, with traffic 54; NJQ-net, QNI 520 in 18 sessions, traffic 130; evening 75-net averages QNI 34, traffic 15. SCT added 2-meter converter and Q5-er to his shack. ZIQ has a new tax deduction — a YL. Silent Key: PYP, Rapid City. Traffic: (Dec.) W0MPQ 168, SCT 106, GDE 89, NEO 63, ZWL 59, SMV 50, BNA 27, YQR 26, AYD 15, QKV 14, BQS 10, LBS 8, GWS 3, (Nov.) W0SCT 89.

**MINNESOTA** — SCM, Charles M. Bove, W0MXC — Asst. SCM: Vince Smythe, 0GGQ. SEC: GTX. RMs: KLG, DQL, and OMC. PAMs: JIE and UCV. Net time and frequencies are: Minn. Junior Net at 1800 on 3690 kc., Minn. Section Net, 1830 on 3595 kc.; Minn. Phone Nets at 1200 and 1800 on 3820 kc.; 160-Meter Net at 1830 on 1815 kc. Your SEC is to be commended for his excellent organizing of our State Emergency Corps. George's figures to date are 43 Coordinators with a count of 227 members and 182 supporting members. Join now by dropping a card to George Lord, W0GTX, P.O. Box 8, Alexandria, Minn. Looks as if this is a ladies' world. The following are active on the air: IRD, IKJ, IRJ, IXR, JAL, JML, KFN, KJZ, KMP, KZD, LPS, PYC, NNO, NQQ, OPX, OWN, RHI, TQQ, QFA, QFX, QZS, NZT, ETV, BQE, and UMK. The Minnesota Section Net gang at KJZ's house rated Becky's (ZDA) plum pudding "tops." In the last Frequency Measuring Test HKF had an average error of 2 parts per million on the 3.5- and 7-Mc. bands. On the 3.5-Mc. band he was off only .6 of a cycle. GGQ and TKX each have a new World Radio Globe King 500-watt rig. VBD has applied for a General Class ticket. OJII, trustee of the Mankato Radio Club, has applied for a station license for the Club's EC station. K6EA is now back in Sunny California. Army is trying to sell us the *Pacific Area Net* paper which is printed for net news. He is trying to have its editor include the MSN in it. GBW and HIN are in a traffic race. CGK is wiring a new Viking Adventurer. The Runestone Radio Club is printing a club album. TUS has traded his 400-watt 813 for TBS's Viking, MQA, from Grand Forks, visited in the Cities. The following are active on 220 Mc. MVP, PYC, IIPS, OFY, OFZ, OTY, OST, and PHZ. They meet at 7:00 P.M. daily. BGY is the proud father of a baby girl. Traffic: W0WMA 444, KLG 435, DQL 307, QNY 264, KNR 196, KJZ 165, K6EA 148, W0HUX 117, IRJ 103, UCV 80, QBW 76, OJH 70, QDP 62, LST 54, LUX 52, RVO 49, ABA 39, GTX 35, GGQ 32, TKX 28, EYW 26, BUO 24, NTV 23, IRD 22, MBD 22, BZG 21, OPA 21, TQQ 21, HIN 20, HNV 20, QZK 20, TUS 20, CID 17, MXC 16, FIT 15, QGD 13, PUO 10, TOK 8, K0WAA 8, W0PBI 6.

## DELTA DIVISION

**ARKANSAS** — Owen Mahaffey, W5FMF — We are sorry to hear about CAF losing part of his home by fire and more damage by water and smoke just before Christmas. VQD is the proud possessor of a new Collins receiver. A new ham in Fayetteville is WN5ED with a Globe Scout and an S-38C. He has worked 20 states. LUX lost a modulation transformer and will be off 'phone temporarily. The new RM is MSH, operating all bands with a new Lyco 600 and SX-96 receiver. He reports that RWJ is busy with his radio business days and works as a railroad telegrapher nights, which is why he is off the air. We need more slow operators on the OZK Net. See you there. Traffic: W5SXM 73, FMF 29.

**LOUISIANA** — SCM, Thomas J. Morgavi, W5FMO — FYZ, Minden EC, has a home-built phasing exciter driving an 813 s.s.b. on 75 meters. SQI spent 15 days visiting Mexico. NG, Route Manager, reports a visit by 4PL, NCS of the Hit and Bounce Net and dean of traffic men. SAY now is SWL in Venezuela. ONM finally got his antenna coupler working. He is OBS and sends bulletins Tue. at 1700 on 3870 kc., Thurs. at 1700 on 3747 kc., and Sun. at 0730 on 3905 kc. and at 0900 on 3805 kc. DUS made General Class and WQX has Extra Class license now. FMO now is operating from his new ham shack but only because of the efforts of SPZ, MIXQ, PJL, and a neighbor. They carried all the heavy equipment, swung the antennas over to the new shack and reconnected the equipment. FMO's right hand was in a plaster cast at the time. BPL was made by NDV. The Greater New Orleans Amateur Radio Club members are sporting license tags on the front of their cards with their call letters and the club name. Our heartfelt sympathy to the family of Theodore G. Deiler, who passed away Jan. 5th. As engineer-in-charge of the FCC 8th District in New Orleans, he gave many of us exams for

(Continued on page 84)

# THE HQ-140-X...



## "A Ham's Dream"

—says W4VPU

After trying out his new Hammarlund HQ-140-X receiver, Harry H. Harris, Jr., of Charlottesville, Va., W4VPU commented, "This is truly a Ham's dream."

Creating 'dream' equipment for hams is the Hammarlund goal. How well this goal has been achieved is proven by the enthusiastic comments received from satisfied Hams. They appreciate the little extras in design, circuitry and construction built into every Hammarlund product.

For example, the HQ-140-X—the amateur receiver built to professional standards—is rated XFB by Hams everywhere because of its—

**FREQUENCY STABILITY** — less than .01% frequency drift after warmup anywhere from 540 Kc. to 31 Mc.

**EXTREME SELECTIVITY** — sharp signal separation even in the most crowded bands.

**LOW NOISE LEVEL** — a noise limiter that really works.

**RUGGED CONSTRUCTION** — built for easy use for many years.

The HQ-140-X is available either as a cabinet model or for rack mounting. For complete details, write to The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1, New York. Ask for Bulletin R-3.



# HAMMARLUND

SINCE 1910

## Heathkit GRID DIP METER KIT



MODEL GD-1B

**\$19.50** Ship. Wt.  
4 lbs.

with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

The invaluable instrument for all Hams. Numerous applications such as pre-tuning, neutralization, locating parasites, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1½ meter Ham bands. Complete frequency coverage from 2–250 Mc, using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at \$3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial

## Heathkit ANTENNA COUPLER KIT

The new Heathkit Antenna Coupler Model AC-1 was specifically designed to operate with the Heathkit Amateur Transmitter and will operate with any transmitter not exceeding 75 watts RF input power. Rugged design has resulted in a sturdy, well shielded unit featuring a copper plated chassis and shield compartment. Coaxial 52 ohm receptacle on the rear of the chassis connects to a three section PI-type low pass filter with a cut-off frequency of 36 Mc. Tuning network consists of a variable capacitance and tapped inductance in an impedance matching unit.

Capacity coupled neon lamp serves as a tuning indicator and will also provide a rough indication of power output.



MODEL AC-1

**\$14.50** Ship. Wt.  
4 lbs.

## Heathkit IMPEDANCE METER KIT



MODEL  
AM-1

**\$14.50** Ship. Wt.  
2 lbs.

tive null indicator. Shielded aluminum light weight cabinet. Strong self supporting antenna terminals.

The Heathkit Antenna Impedance Meter is basically a resistance type standing wave ratio bridge, with one arm a variable resistance. In this manner it is possible to measure radiation resistance and resonant frequency and antenna transmission line impedance; approximate SWR and optimum receiver input. Use it also as a monitor or as a field strength meter where high sensitivity is not required. Frequency range of the AM-1 is 0–150 Mc and range of impedance measurements 0–600 ohms. The circuit uses a 100 microampere Simpson meter as a sensi-

amateur and commercial tickets. Traffic: (Dec.) W5NDV 493, MIXQ 252, NG 140, KRX 112, EA 49, VIC 35, ONMI 2, SQI 2. (Oct.) W5KRX 80.

**MISSISSIPPI** — SCM, Dr. A. R. Cortese, W5OTD — SEC; KHB, RM: WZ, PAM: JHS. The Hurricane Net meets every night at 6 P.M. on 3935 kc. The Magnolia Net meets Sun. at 1:30 P.M. on 3870 kc. IHP is the new NCS. The Interstates Relay Net meets every morning except Sun. at 10 A.M. on 3870 kc. PFC is president of the Jackson Amateur Radio Club and OAE is secretary. The teen-age hams of Jackson have formed a c.w. net on 3734.5 kc. which meets on Sun. at 2 P.M. The Bailey Jr. High School Radio Club has been reorganized with DQL as president. MARS has reorganized the Mississippi State C.W. Net which meets daily Mon. through Fri. on 4025 kc. at 1800Z–1900Z. CSII has dropped the "N." TIR has two new 75-ft. pre-fab antenna masts. JHS still is monitoring 29.6 Mc. for mobiles. Traffic: W5VME 343, EWE 274, TIR 139.

**TENNESSEE** — SCM, Harry C. Simpson, W4SCF — SEC; RRV, PAM: PFP, RM: WQW. The Memphis Club elected CRP, pres.; GQQ, vice-pres.; STI, secy.; WTJ, treas.; VT, AFB, DCH, HHK, BAQ, and SCF, directors. ZJY is back on 'phone. The Tennessee Valley 10-meter Emergency Net now is an ARRL affiliate, as is the Clarksville Club. New ECs are BBD and TYU. TYU got a CAN certificate. A new OPS is UWA. FLW reports the Weakley County RACES Net meets Mon. at 2130 on 50.353 Mc. The Tennessee C.W. Net handled 395 QTC during December. OGG reports traffic at an all-time high on RN5. Friends will be sorry to hear of the passing of HK. While on a 7-week vacation trip to Texas and Old Mexico, PL visited W5 IGW, MN, and NG. BMI is NCS of the new c.w. practice net Tue. and Fri., 3635 kc., at 2100 CST. Flowers to PL, OGG, TJI, UWA, and ZJY for making this our best BPL month. RRV has a wonderful new idea for a Novice Emergency Net. Details when available. The Tennessee 'Phone Net averaged 32 QNI per session. High-speed c.w. handled 54 messages in a 40-minute session. Under "special stunts" WQW reports he "flew a Ford into a pole!" BBD reports 15 new AREC members. GUE has a new YL jr. operator. New Cookeville Club officers are BER, pres.; ZJY, vice-pres.; and UWA, secy.-treas. Traffic: (Dec.) W4PL 1994, OGG 1556, TJI 527, UWA 381, TYU 297, K4FET 280, W4HHI 271, SON 229, IIB 171, TZD 139, ZJY 135, SCF 117, WQW 112, PFP 83, CXY 71, BQG 60, OEZ 52, IV 46, RRV 43, PGP 41, UOA 41, PHQ 35, VJ 33, AQN 26, UVS 26, WJG 20, RHK 17, YMB 16, PAH 15, BAQ 12, BBD 8, RMJ 8, PVD 6, DCH 4, FLW 4, NPS 1. (Nov.) W4PFP 80, SGI 1, ZJY 1.

## GREAT LAKES DIVISION

**KENTUCKY** — SCM, Robert E. Fields, W4SBI — A salute to our new SEC, CDA. He relieves NBY, who has been doing an FB job as SEC but has found it necessary to give it up to further his studies in Christian work. He is starting on a World Study Tour soon. UR/1 is currently stationed at Fort Devens, Mass. HSI, ex-5FOJ, is a new ham in Kentucky and is doing an FB job with appointments as OPS and ORS. WNH is a new OES. KKW is really keeping the KYN rolling along. BAZ reports that too many errors in overseas traffic is resulting from QSP via 'phone stations. NIZ and RPF are doing some leg work in organizing some new 'phone nets for better coverage in the State. K4FBW is going strong on 2 meters with 522 transmitter and a BC-639 receiver using four-element beams stacked. YOK has bought a 500-watt rig from 9JLL and is looking for some 812As. WXL handles a lot of traffic while pursuing his studies at college. JPV again is handling long-haul traffic. SBI reports that this is the best activity report in quite a while. NIZ has been reporting station activity faithfully for some time, but for some unknown reason has been omitted from QST. I am really sorry about that for it might have been our fault. I do have a deadline to meet so, fellows, won't you please mail your reports to reach me not later than the 7th of each month. The Amateur Radio Transmuting Society (ARTS) has elected the following officers: KQI, pres.; TLU, vice-pres.; CDO, secy.-treas. Traffic: K4FBW 414, W4PXX 294, BAZ 272, KKW 235, WXL 209, SBI 160, ZLK 131, MWR 82, CDA 75, HSI 71, RPF 48, ZDB 40, WNH 37, GFG 32, JCN 32, NIZ 32, KRC 24, SZB 16, BAM 12, ZDA 11, HJQ 10, YOK 10, JU 8, UR/1 4, PAM 3.

**MICHIGAN** — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: (phone) Bob Cooper, 8AQ4; (c.w.) Joe Beljan, 8SCW. SEC: GJIL. EMD is now OO Class III and IV. Many thanks for all of the holiday greetings received from the gang. BPL cards went to QAH, NUL, NOH, SWG, and WNO for December traffic. SWG says it was the best month in his entire ham career, and RTN is enjoying his best traffic season. Our congratulations to the QQOs, whose new 8th harmonic was heard overmodulating on all bands Dec. 31st. Doc says the feedline now has a standing wave ratio of three to five, in favor of the girls! New officers of the Edison Amateur Radio Assn. are PKA, pres.; WEL, vice-pres.; CYJ, act. mgr.; ILP, secy.-treas. HSG spent the holidays traveling through the South, and had a three-day visit with 4PL. "There," says Cos, "is a

(Continued on page 90)

**HEATH COMPANY**  
BENTON HARBOR 9, MICHIGAN

# \$1950

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model transmitter. It has sufficient output to any multi-stage transmitter of modern A terrific combination of outstanding at a low kit price. Good mechanical

and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard  $\frac{1}{2}$ " crystal holder. Construction is simple and wiring is easy.

- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OAZ voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

Open layout.—  
easy to build  
— simplified  
wiring.

Smooth acting  
illuminated  
dial drive.

Clean  
appearance  
— rugged  
construction —  
accessible  
calibrating  
adjustments.

Ceramic coil  
forms —  
differential  
condenser.

Copper plated chassis—careful shielding.

**\$2950**

**SPECIFICATIONS:**

Range 80, 40, 20, 15, 11, 10 meters.  
6AG7 ..... Oscillator-multiplier.  
6L6 ..... Amplifier-doubler.  
5U4G ..... Rectifier.  
105-125 Volt A.C. 50-60 cycles 100  
watts. Size: 8 1/8 inch high x 13 1/8 inch  
wide x 7 inch deep.

Crystal or  
VFO excitation.

Prewound coils  
— metered  
operation.

52 ohm  
coaxial  
output.

Built-in power supply.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

Rugged,  
clean  
construction.

Single knob  
band  
switching.

Four band  
operation 535 to  
to 35 Mc.

### Stable BFO oscillator circuit

RF gain control  
with AVC or  
MVC.

**5 1/2 inch PM  
Speaker.  
Headphone  
Jack.**

### Six tube transformer operation

**Electrical  
bandspread  
and scale.**

Noise limiter—standby switch.

**SPECIFICATIONS:**

Range.....	535 Kc to 35 Mc
12BE6 .....	Mixer-oscillator
12BA6 .....	I. F. Amplifier
12AV6 .....	Detector—AVC—audio
12BA6 .....	B. F. O. oscillator
12A6.....	Beam power output
5Y3GT .....	Rectifier
105-125 volts	A. C. 50-60
cycles, 45 watts,	

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio.

**Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.**

**\$25<sup>50</sup>**

Ship. Wt. 12 lbs.

**CABINET:**

Proxylin impregnated fabric covered plywood cabinet. Shpg. weight 5 lbs. Number 91-10. \$4.50.

# HEATH COMPANY

BENTON HARBOR 9, MICHIGAN

# NOW a BROAD-BAND\* LINEAR

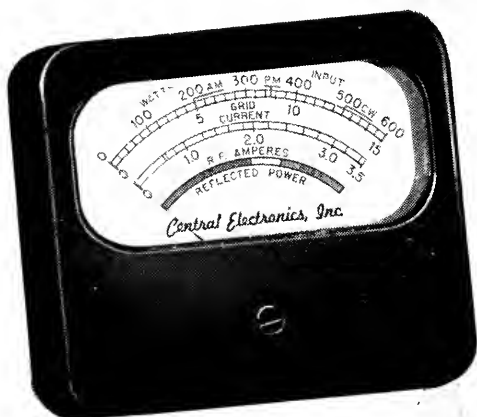
**MULTIPHASE  
600 L  
NO TUNING  
CONTROLS**

SINGLE KNOB  
BAND-SWITCHING  
10-160

FOR USE ON  
SSB, AM, PM & CW



WIRED, WITH TUBES AND  
BUILT-IN POWER SUPPLY **\$349.50**



## Another C.E. First!

**METER FEATURES NEVER BEFORE  
FOUND IN A TRANSMITTER**

- Reads power input directly in watts
- Reads grid current
- Instantly reads output in RF amperes — no lagging thermocouple
- Indicates reflected power caused by mismatched load
- Calibrated input levels for AM, PM and CW.  
... and switch the meter to any position while transmitting!

\*PATENT PENDING

**WRITE FOR LITERATURE**

## a new concept in linears

CENTRAL ELECTRONICS takes pride in presenting a product of intensive research — the new Multiphase 600L Broad-band\* Linear. "It is destined to change the entire concept of RF amplifier design in the military, commercial and amateur fields." There are no tuning controls, servos or moving parts other than band-switch.

- Single 813 in Class AB<sub>2</sub>.
- New band-pass couplers provide high linear efficiency: 60 to 65%.
- Designed for 50 — 70 ohm co-axial input and output.
- Easy to drive — Approx. 2 watts effective or 4 watts peak drive power required for 500 watts DC input.
- Built-in power supply — bias and screen regulation, 45 mfd. oil filled paper output capacitor. Excellent static and dynamic regulation.
- Extremely low intermodulation distortion.
- Automatic relay protects 813 and RF couplers.
- Excellent stability — complete freedom from parasites.
- Effectively TVI suppressed — RF compartments thoroughly shielded and Hypassed.
- Choice of grey table model, grey or black wrinkle finish rack model.
- Table model cabinet size — 14 $\frac{5}{8}$ " W, 8 $\frac{3}{4}$ " H, 13" D.

**MULTIPHASE**



**EQUIPMENT**

*Central Electronics, Inc.*

1247 W. Belmont Ave.

Chicago 13, Illinois

Watch for early announcement of other new  
**CENTRAL ELECTRONICS**  
equipment.





**MODEL 20A**

**MULTIPHASE EQUIPMENT** is the overwhelming choice of SSB OPS everywhere. Ask any ham who uses it! Listen to it perform on SSB, AM, PM or CW!

### MODEL 20A

- 20 Watts Peak Power Output SSB, AM, PM and CW
- Completely Bandswitched 160 thru 10 Meters
- Magic Eye Carrier Null and Peak Modulation Indicator

Choice of grey table model, grey or black wrinkle finish rack model.

Wired and tested.....\$249.50  
Complete kit.....\$199.50

### SIDE BAND SLICER

#### MODEL A IMPROVES ANY RECEIVER

Upper or lower sideband reception of SSB, AM, PM and CW at the flip of a switch. Cuts QRM in half. Exalted carrier method eliminates distortion caused by selective fading. Easily connected into any receiver having 450-500 KC IF. Built-in power supply. Reduces or eliminates interference from 15 KC TV receiver sweep harmonics.

Wired and tested.....\$74.50  
Complete kit.....\$49.50

### Check These Features NOW IN BOTH MODELS

- **Perfect Voice-Controlled Break-in** on SSB, AM, PM.
- **Upper or Lower Sideband** at the flip of a switch.
- **New Carrier Level Control.** Insert any amount of carrier without disturbing carrier suppression adjustments.
- **New Calibrate Circuit.** Simply talk yourself exactly on frequency as you set your VFO. Calibrate signal level adjustable from zero to full output.
- **New AF Input Jack.** For oscillator or phone patch.
- **CW Break-in Operation.**
- **New Gold Contact Voice Control Relay.** Extra contacts for muting receiver, operating relays, etc.
- **Accessory Power Socket.** Furnishes blocking bias for linear amplifier and voltage for optional VFO (Modified BC458 makes an excellent multiband VFO).
- **40 DB or More Suppression** of unwanted sideband.



### MODEL 10B

#### SUCCESSOR TO THE POPULAR MODEL 10A

- 10 Watts Peak Power Output SSB, AM, PM and CW
- **Multiband Operation** using plug-in coils.

Choice of grey table model, grey or black wrinkle finish rack model. With coils for one band.

Wired and tested.....\$179.50  
Complete kit.....\$129.50

### QT-1 ANTI-TRIP UNIT

Perfect Voice Operated Break-in with loudspeaker. Prevents loud signals, heterodynes and static from tripping the voice break-in circuit. All electronic — no relays. Plugs into socket inside 20A or 10B Exciter.

Wired and tested, with tube....\$12.50

### AP-1 ADAPTER

Plug-in IF stage — used with Slicer, allows receiver to be switched back to normal.

Wired and tested, with tube.....\$8.50

### NEW AP-2 ADAPTER

Combined AP-1 and xtal mixer. Allows Slicer to be used with receivers having 50, 85, 100, 915KC and other IF systems. One xtal suffices for most receivers.

\$17.50

**WRITE FOR LITERATURE**

**MULTIPHASE  
EQUIPMENT**

*Central Electronics, Inc.*

1247 W. Belmont Ave.

Chicago 13, Illinois

Watch For Early Announcement Of The New DeLuxe MULTIPHASE VFO.



**March  
21-24**

The  
Radio-Electronic

**SPECTACULAR**

of 1955!

**See!  
Hear!**

**IRE  
National Convention**

**7** out of **704\***

**good reasons why  
you should attend**

**the Radio  
Engineering Show**



**Hear...**

vital research and engineering papers  
on computers, transistors, color TV,  
etc., subject-organized in 55 sessions.



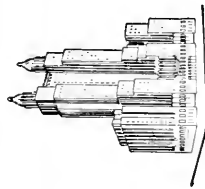
**Watch...**

a computer balance a cane, making  
20 corrective moves a second—at the  
IRE Show.



**See...**

the exhibits of 69 components vital to  
successful Automation. Or compare  
21 different types of Transistors—  
and other subminiature components.

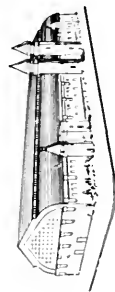


**At both the Waldorf-Astoria** (convention headquarters) and Kingsbridge Armory, you'll attend what actually amounts to 22 conventions fused into one. Hundreds of scientific and engineering papers will be presented during the many technical sessions, a large number of which are organized by IRE professional groups. You'll meet with the industry's leaders—enjoy the finest meeting and recreational facilities in New York.

and

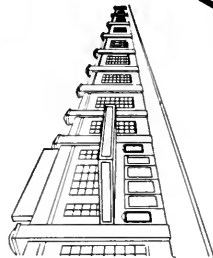
## Radio

# Engineering Show



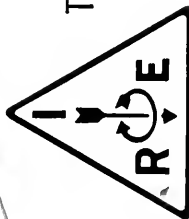
**At the Kingsbridge Armory and Kingsbridge Palace**, you'll walk through a vast panorama of over 700 exhibits, displaying the latest and the newest in radio-electronics. You'll talk shop with the industry's top manufacturers—enjoy the conveniences provided for you in the world's finest exhibition halls, easily reached by subway and special bus service.

Admission by registration only. \$1.00 for IRE members, \$3.00 for non-members. Social events priced extra.



**The Institute of Radio Engineers**

1 East 79 Street, New York



## Check-up on...

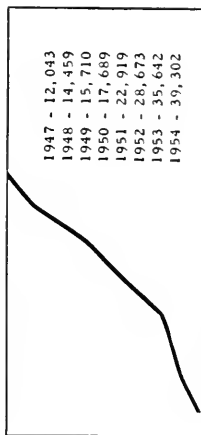
"1955 Instrumentation" shown on Instruments Avenue. Exhibit grouping helps you see more on the Avenues named.

**Audio • Broadcast • Radar  
Transistor • Television  
Radio • Components • Microwave  
Airborne • Production  
Circuits • Computer • Electronics**



## Meet...

all your friends. 39,302 attended IRE in 1954.



## Enjoy...

The Convention's Social Events. It is good to mingle with your industry friends at IRE.



## Get the facts...

faster and easier at exhibits and sessions than you could from weeks of your own "digging."

*\*Send for the 1954 Directory of 604 Exhibitors and list of 100 new exhibitors.*

(Continued from page 84)

great guy and a grand gentleman." He has three rigs (kw, each) which he usually runs at 160 to 350 watts, has been on the air for 25 years, and has never worked a minute of phone. ILP's nineteen-year-old daughter was taken to the hospital for an emergency operation on Christmas Day but is now OK. JKK is buying a new house and the moving and reinstallation work may keep him off the air for a couple of months. WJO operated his station in a booth at a Crafts Exhibition and ran up some nice traffic totals. MRL sold the HT-20 and Matchbox and now runs 650 watts 'phone and 850 watts c.w. to a BC-610E. NEJ finally moved into the new quarters at the Gamie Refuge and now boasts of a 3½-wave antenna on 75 meters bunched to the top of a 100-ft. fire tower. DAP wants information on the Great Lakes Net. Anyone got it? NDG is a newcomer to both QMN and THN and says he enjoys both. By the way, any of you fellows who are home at noon are missing out on lots of traffic on THN, 3663 kc. every day at noon, if you haven't checked in. The first official meeting of the new Holland Area Radio Club was held Dec. 9th in the Red Cross Office at Holland. Officers elected were GCW, pres.; and NYA, secy.-treas. Traffic: (Dec.) WSOAQ 512, NUL 509, NOH 463, ILP 306, SWG 250, RTN 236, JKN 160, ZLK 144, WVL 139, WJO 122, QIN 109, URM 102, PHA 91, FX 79, DSE 76, MRL 69, INF 47, AUD 43, NEK 40, IV 38, DAP 30, NDG 25, OQH 24, OT 23, DLZ 18, PHM 15, HKT 14, TBP 12, MEX 8, ZHB 8, EGI 6, (Nov.) WSRTN 208, PHA 94, QOQ 34, NEJ 26, TBP 21, PDF 12, PHM 2.

**OHIO** — SCM, John E. Siringir, W8AJW — Asst. SCMs: J. C. Erickson, SDAE; W. B. Davis, 8JNF; and O. V. Bonnet, SOVG. SEC: UPB. RMs: DAE and FYO. PAMs: EQN and HUX. BPLs were plentiful for December as ARO, FYO and RO each qualified for the third and last leg of their BPL medallion awards. IJNP and QHW each made his first BPL award. New appointees are SÖL as EC, IVE as OBS, and VTF as ORS. A regrettable typographical error appeared in January QST. It was GL who passed away and not DL. New West Park Radiop officers are ZEU, pres.; OPX, secy.-treas.; FRB and AGA, trustees. AJH reports that IFZ has been the stand-out mobile in the Cleveland Area transmitter hunts. GZ claims 105 countries on s.s.b.c. SPU has worked about 200 mobile stations. OSD is working portable in Delaware, Ohio. WE's NYL, OTK, has received her General Class license and is trying for her last eight states for WAS. ROX made 407 FD contacts with 30 watts and an indoor antenna. ZAU is operating portable in New Mexico during February. GDQ worked LU3EL, YV5DE, and VP4LZ on 160 meters, along with a couple of Gs and a VO. DSX, mgr. of SRN, reports Ohio was represented 40 times during December. An additional December appointment was OES for KQY. HHF, Acting EC for Lucas County, reports that NBD was the winning mobile in the December 160-meter hidden transmitter hunt. Novices RSJ and RTA are twin brothers in Canal Winchester. WNSRCG took his General Class exam in December. TPM is ex-ØASE. The Dayton RF Carrier reports that new DARA officers are GQ, pres.; RCA, vice-pres.; MDK, secy.; DHJ, treas.; OVG and ZOF, board members. The DARA Christmas Party was held Dec. 18th at the Albatross Club. FPH handles the Monday C.D. Net and the Patterson High Radio Club has elected KQY as president. The GCARA *Mike and Key* tells us beginners' code classes are held on Tue. at 7:30 p.m. and theory classes follow at 8:30. Cincy's OVARA *Ether Waves* states that the Club 88 score list pretty close to 1,800,000 points. Springfield's Q-5 reports that new officers are WXX, pres.; KQW, vice-pres.; DCJ, secy.; OKB, treas.; and ENS, editor. The FHARA *News Bulletin* mentions that new amateurs in the area are PNZ and QJH; the IUVs have acquired a brand-new baby daughter, and IZT has taken over as Hamilton's leading DX man. The Columbus *Carascope* informs us that RHY lost his one and only appendix; MRC and OMY are knocking off a bit of rare DX; and the Club's Christmas Party produced a husky and happy turnout. Toledo's *Shack Gossip*, edited by those lovely ladies HUX and HWX, relates that YAZ and VQP have moved to 2 meters. NBO and PXO have started on 160 meters. 9YEL was the first W9 to receive the WTO Award. JOR has a new 44-ft. vertical. MBE has returned to c.w., and ERII has become reactivated. Eastern Ohio *Ham Flashes* reports that NYZ has moved to California; TTQ and TTX are new Novices in Hubbard; EK is Radio Officer for Area 3 Control Center, while DUX is his assistant; NDB is president of Warren Harding High's radio club; NXX has procured a Viking II; and GST has moved from Youngstown to Canfield. Those Dayton F.M.T. wizards, HB, YCP, CUJ, and GQ, again topped the Ohio section. Traffic: (Dec.) W8FYO 994, ARO 926, QIHW 562, DAE 381, FPZ 338, LHV 224, RO 221, IJNP 217, IFX 151, AMH 144, MQQ 141, DG 83, AL 78, SRF 58, LMB 43, GDQ 38, LZE 37, AJW 36, GZ 34, IHF 24, BEW 22, QIE 20, TLW 20, ROX 19, KIH 16, EQN 13, AHI 12, WAV 12, HUX 10, WE 10, CRA 8, NQO 8, AEU 7, MGC 7, DL 6, ET 6, HFE 6, PBX 6, BLS 5, CSN 5, DMD 5, IIFR 4, IAY 4, OQP 4, WJB 4, TJD 3, AYR 2, HPP 2, KDY 2, KXN 2, LER 2, LVW 2, WYL 2, BZD 1, PM 1, (Nov.) W8EQN 20, WE 14, ZAU 13, ROX 7, SPU 2, (Oct.) W8ZAU 4.

## HUDSON DIVISION

**EASTERN NEW YORK** — SCM, Stephen J. Neason, W2LJL — SEC: RTE, RM: TYC, PAMs: GD1D and JIG. It gives me pleasure to announce the appointment of LEL as Asst. SEC. Don is well qualified for the post and will be of much help to RTE, our very busy SEC. QGV has a converted AP-13 going on 430 Mc. Newly-elected officers of the SARA are YIV, pres.; ZBY, vice-pres.; GRI, secy.; K2HON, treas.; NZE, K2AXY, and K2CKS, directors. GFH and BKW are on the sick list. We hope for a speedy recovery. APF and family are touring Europe by air. K2BKU has an 813 final going on 3.5 and 7 Mc. WWK is the new EC for Schenectady County. Frank also is NCS for the Schenectady AREC Net each Sun. at 1400 on 3925 kc. K2BSD handled stacks of Christmas traffic. GYV moved to a new QTH in the Town of Colonie with enough room for stacked rhombics, he says. YIK moved to Syracuse recently. RMM has the s.s.b. fever. He is testing a newly-designed s.s.b. exciter. KN2JTY, manager of the MIT Net, urges all Novices to be sure and call in on 3716 kc. each Sun. at 1300. If you don't have a crystal, drop Pete a line. K2ANL has 120 watts on 29-Mc. mobile. K2EOM is Acting RO for Peekskill. KN2HQW has a new sixteen-element beam on 144 Mc. ILI is the new RO for Dutchess County. K2EHI was awarded a Section Net certificate for activity on NYSEPN. K2GCH works DX on 144 Mc. with the family TV antenna. The IBM Club Christmas Party was an FB affair with many visitors present, including 20 from Peekskill. Gifts were exchanged, prizes were awarded, and refreshments topped off the evening. Please check your appointment expiration date now. Traffic: (Dec.) K2EQD 41, EHI 26, (Nov.) K2BJS 244, EOQ 32, BE 30, W2GDD 27, K2EHI 26, W2LRW 26.

**NEW YORK CITY AND LONG ISLAND** — Carleton L. Coleman, W2YBT — Asst. SCM: Harry J. Dannels, 2TUK. SEC: ZAI. PAM: JZX. RMs: VNJ and LPJ. ZAI reports AREC activity at its peak with successful drills held by the Staten Island and Brooklyn groups. Nassau EC, FI, lists more than 56 stations reporting weekly on the Mon. evening 144-Mc. net, with an additional 28 stations active on Thurs. evening on 10 meters. A busy December was had by the section's traffic gang with a record total of 10 BPL winners. Note KEB's total of 2097, followed by OM, KFY, and LPJ's fine total, and JOA's one-week BPL effort while enjoying college holidays. K2CQP is the new manager of TAN. VNJ's son now is KN2KLC. BO now is using a two-element beam on a 40-ft. pole for 14-Mc. overseas traffic. AEE, with three traffic-handlers, made BPL K2ABW and his Dad, IHE, finished the 250-watt which was Army's Christmas present. K2IHD is building a radio-controlled airplane. DSC has a Collins Auto-tune KW. New officers of the Lake Success RC are CWD, pres.; DLO, vice-pres.; and QAN, secy. BMK received WAS and is planning 75-meter operation. LGK reports the Tuboro Club still is awarding a certificate to any station working 5 members. New Tuboro Club officers are AZY, pres.; END, vice-pres.; LGK, secy.; MES, treas.; and IAG, financial secy. K2DET is mobile with Stancor and broad-band converter. JBP returned from Guam and then left to work in W6-Land. K2s HYK and JEB are new ORS. Officers of the Levittown RC for the new year are AEV, pres.; K2GXL, vice-pres.; JUN, secy.; and K2CFB, treas. The North Shore RC plans an s.s.b. net for the high end of 20 meters. GDL is on s.s.b. with 10A and 807s. K2AMP now is handling traffic with the NLI Net. K2GXL and his XYL, KN2IBH, are active on 144 Mc. JZX now is an honorary member of the Broadhollow RC. K2KIX, formerly the Republic Aviation RC. New officers of the L. I. unit of the YLRL are KN2EBU, pres.; KAE, vice-pres.; K2CFF, secy.; JZX, treas.; and UXM and KN2JHQ, trustee. The Fordham RC is giving classes in radio theory at 7 p.m. on the 1st and 3rd Fri. The Northern Nassau RC has elected the following officers for '55: CJY, pres.; CNN, vice-pres.; YML, rec. secy.; DUO, corr. secy.; and ADO, treas. YHP increased 144-Mc. power from 1 to 15 watts in preparation for the V.H.F. Sweepstakes. K2HYK is increasing power on 80 meters to 45 watts. EEN has been active in all contests since returning to the air. K2AMM is building 144-Mc. receivers. The Hudson Division Convention, under the sponsorship of the FLIRC, is scheduled for June at Long Beach with K2EP acting as chairman. Wantagh RC officers are UGO, pres.; ELK, vice-pres.; and K2DRD, secy. GYL has added a new SX-88 for DX hunting. RB has a Johnson Viking II and VFO. GG is planning some aero-mobile operation for summer. K2HML has moved to New York City. On Nov. 27th meetings of the ACARC and the College Net were held in New York City. Twelve different colleges were represented at the College Net meeting. This Net meets on 3895 kc. Thurs. at 1600 and Fri. at 1515. Please continue mailing reports to TUK. Traffic: (Dec.) W2KEB 2097, KFY 1608, LPJ 1025, VNJ 912, BO 828, K2CQP 775, W2JOA 706, AEE 466, MUM 276, JGV 223, K2ABW 151, W2JZX 139, K2AMP 112, W2IHE 84, K2CRH 69, W2IVS 48, OME 46, K2HID 32, W2DSC 31, GP 31, IN 20, K2CMV 20, W2LGK 14, PF 14, OBU 13, TUK 5, K2AED 4, HYK 4, W2OKU 3, MDM 1, K2GZE 1, (Nov.) W2AEE 86, K2AED 9, W2BMK 6, MDM 1, (Oct.) W2MUM 121.

(Continued on page 92)

# Thanks for that 5 by 9 plus, Algiers!

## WE'RE USING A VIKING II HERE!

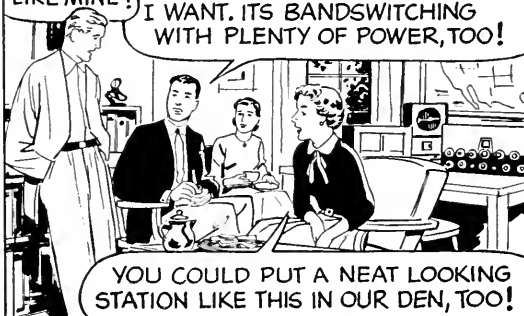


THIS IS A SWELL LAYOUT, PETE. WISH I COULD MOVE MY SHACK OUT OF THE BASEMENT.



GEORGE, WHY DON'T YOU UNSCRAMBLE YOURSELF FROM THAT "HAYWIRE" AND BUILD UP A PROFESSIONAL LOOKING

VIKING II LIKE MINE? I REALLY SHOULD. THAT VIKING HAS EVERYTHING I WANT. ITS BANDSWITCHING WITH PLENTY OF POWER, TOO!



YOU COULD PUT A NEAT LOOKING STATION LIKE THIS IN OUR DEN, TOO!

THIS IS THE WORLD FAMOUS VIKING II...THE CHOICE OF JUST ABOUT ONE OUT OF EVERY FOUR AMATEURS.

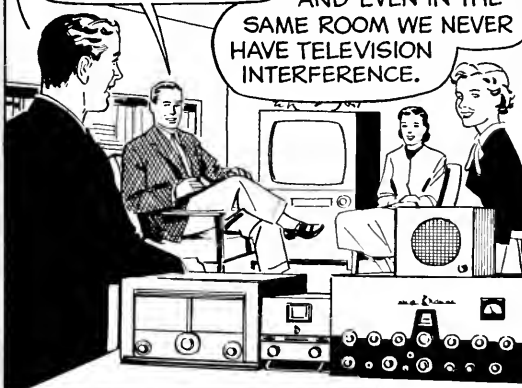


THAT'S WHAT I WANT. IT'S PROFESSIONAL IN APPEARANCE AND DESIGN AND IT'S PACKED WITH FEATURES.

LIKE? I'M REALLY SOLD ON THE VIKING'S PERFORMANCE!

GEORGE, IT'S GREAT!! I SEE YOU TOOK MY ADVICE AND GOT A VIKING VFO, ALSO.

AND EVEN IN THE SAME ROOM WE NEVER HAVE TELEVISION INTERFERENCE.



BOY! THIS KIT IS SURE COMPLETE! IT INCLUDES EVERYTHING FROM THE WIRING HARNESS TO THE PUNCHED CHASSIS...AND THOSE STEP-BY-STEP INSTRUCTION PICTURES

...AND IT CERTAINLY WAS ECONOMICAL, TOO!!

MAKE IT A CINCH TO WIRE.



### VIKING II TRANSMITTER KIT

- 10 Thru 160 Meters
- 180 Watts CW Input
- 150 Watts Phone Input



Available wired and tested, with tubes . . . or as a complete kit, the Viking II is today's most popular amateur transmitter.

Cat. No. 240-102. Complete with tubes, less crystals, key and mike. **\$279.50**  
Amateur Net

Cat. No. 240-102-2. Wired and tested with tubes, less crystals, key and mike. **\$337.00**  
Amateur Net

MAIL TODAY

#### E. F. JOHNSON COMPANY

288 Second Ave. S. W., Waseca, Minnesota

Please send me a copy of Catalog No. 714, containing a complete written and pictorial description of the Viking II.

NAME \_\_\_\_\_

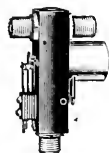
ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

# CONTINUAL RESEARCH AND ENGINEERING

EXPLAIN DOW LEADERSHIP

Model DKC



← Special connector protects your receiver from R.F. during transmission (Optional).

← Silent AC magnet prevents hum modulation of carrier—AC types guaranteed as quiet as DC.

1000 WATTS  
Length 4½",  
width 3"

Transmit contact-pressure over 75 grams, making the 1000 w. rating very conservative. Causes negligible change in SWR up to 100 Mc.

DKF2 rigid adapter for external chassis mounting, \$1.85



AC types (All volt.) Amateur net.....\$10.50  
DC types (All volt.) Amateur net..... 9.50

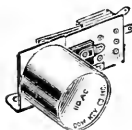
See your distributor. If he has not yet stocked Dow Co-axial relays, order from factory. Send check or money order or will ship COD. Prices net FOB Warren, Minn. Shipping Weight 9 oz. Dealers' inquiries invited. Literature on request.

Add \$1 for external switch (Optional)

Add \$1 for special receiver protecting connector (Optional)

**THE DOW-KEY CO., INC.**  
WARREN, MINNESOTA

## MIDGET ALL-PURPOSE POWER RELAYS BY DOW



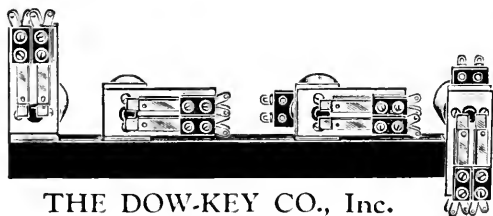
Model DKP

... a new class of relay  
for Radio and Industry

**DKP**

This new midget power relay combines features of midget open type relays and the rugged power types, ideal for small space.

Silent as a DC relay, rated at 25 amps non-inductive load at 110 V... mounts easily under a 1½" chassis... carefully engineered for control circuits, motor starting... quiet, rugged... linkage and lost motion eliminated by direct magnet thrust... this versatile relay solves mounting problems; easily changed mounting foot allows combinations for chassis, bank or rack mountings... heavy leaf springs and 3/16" coin silver contacts with operate time of 2 to 5 milliseconds put the DOW Midget All-Purpose Power Relay in class by itself.



**THE DOW-KEY CO., Inc.**  
WARREN, MINNESOTA

**NORTHERN NEW JERSEY**—SCM, Lloyd H. Manamon, W2VQR—Asst. SCM: Charles Teeters, K2DHE. SEC: IIN, PAM: CCS, RMs: EAS, CGG, and NKD. CFB is building a pulse transmitter for the 3500-Mc. band. The Irvington Radio Amateur Club is conducting code and theory classes the 2nd and 4th Mon. of the month for Novice and General Class tickets. Classes are under the direction of WFK. Prospective hams in the area are invited to attend these classes at the club rooms in the Irvington Community Bldg. HXP is working on RACES projects. K2CHI is experimenting on new antennas. K2BWQ has received his second MARS citation for exceptional participation for the month of November. His daughter Barbara, K2CLC (AA2CLC), age 16, became the youngest MARS member in the U. S. on her birthday Dec. 9th. Barbara and her dad now become the first father/daughter team to be registered in MARS work. EAS has been away from the home QTH for the past two months in connection with his work with United Air Lines in the communications field. NYI has received BERTA certificate. HXU is having his troubles with TVI. VYB was home on leave over the holidays. KBO has been laid up in the hospital for some time. We all wish you a speedy recovery. OM, K2GBP is building a new base station now that the mobile transmitter is in good shape. K2EKO and GRU are busy chasing DX. BRC is on low power on 20 meters while the new rig is being built. The Windblowers VHF Society held a hobby party at the home of NUL. K2EDQ is a new OO. K2DSW is temporarily QRL because of attending school at ICA. However, during the holidays he had a few minutes spare time and ran up a traffic total of 411. K2GAS is a new OITS. K2EUN made BPL for the first time. KN2JOM has moved to North Brunswick. K2BAY confesses he never should have monkeyed with his sky wire. As a result his heaters have not been warm since Nov. 17th. K2BWQ has added a new tape recorder to his station. The Livingston Amateur Radio Club is sponsoring a building program on s.s.b. excitors. Much credit to the promotion of s.s.b. activity within the club is due JCCU (ex-2NJR) and 2ICA. The s.s.b. group shortly will conduct an on-the-air net on 75 meters. Currently active on s.s.b. are BWN, CCF, COT, GBT, ICA, IID, NRQ, and ORX. Annie, the YL operator at K2ICE, has acquired the name of "Hurricane Annie." Thus stemmed the new Hurricane Net in Monmouth County, which meets nightly, with Annie at the helm, on 144 Mc. K2HNA is heard on the air from K2DHE's QTH. ENM is the proud possessor of a new 4-230A all-band final. NIE has a unique omni-directional 144-Mc. beam. This all happened when the brake failed on the Gordon Rotator. We think the beam still is spinning atop the 100-ft. tower. FC is heard regularly on 144 Mc. with his new Gonset. OUS is mobile on 144 Mc. all over the county. Tune in any time and you will hear him on the road combining business with a little hamming. K2CTL is building a new mini-beam for 14 Mc. Traffic: (Dec.) K2EUN 602, DSW 411, W2CQB 331, K2GAS 329, W2EAS 171, K2GFX 118, W2FPM 56, K2BWQ 41, W2CJX 14, K2CHI 6, GER 6, KN2JOM 6, W2NYI 6, IIXP 5, CVW 1. (Nov.) W2EAS 123, K2CHI 4, W2CFB 4.

## MIDWEST DIVISION

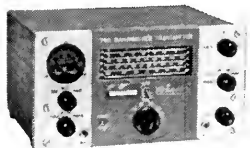
**IOWA**—SCM, William G. Davis, W0PP—Iowa ended 1954 with the most reports to the SCM and, I believe, the biggest traffic total since I have been SCM. SCA earns his 48th BPL with his biggest month. Doc has been disabled from a fall while fixing his antenna. I must award 4 BPLs this month and a near miss by CZ. QVA reports: YBK has rejoined TLCN, UTD is a new member of the Net. DDV is our new SEC, succeeding VLA. HMM climaxed his class by giving the exams to 9 students, ranging in age from 10 to 60 years. QVA gave the Novice Class test to a 13-year-old Burlington lad. VYH has gone to I.S.C. for the spring term. Section Net certificates were awarded to KVJ and LCG, the latter a YL. LJJ reports for the Muscatine Club: BGN is on 2 meters. VLD worked 16 states on 2 meters with 5 watts. LIG has returned from TV school in Chicago. LJW is reporting from Davenport. HMM's radio class is doing very well. CGY continues his DX on 80-meter c.w., including Midway I. RKT and FIE are going great guns on mobile. LJW reports December was his best month for traffic. He's using a vertical antenna. Santa brought BLH a new Johnson Match Box which he intends to use on a 40-meter vertical. The Waterloo Club threw a Christmas Party for the XYLS. BBZ was home on leave but is back on the USS Rochester. It is now time to think of your nominations for SCM. Please consider carefully and get your nominations in. I will not be able to accept again because of a change in my work status. Traffic: W0SCA 3271, BDR 3156, PZO 931, LCX 766, CZ 419, LJW 224, QVA 86, BLH 78, KVJ 67, NGS 34, RMG 26, HWU 13, DDV 12, NYX 12.

**KANSAS**—SCM, Earl N. Johnston, W0ICV—SEC: PAH. RM: KXL/NYI. PAM: FNS. A new club known as the Wheat Belt Radio Club, with headquarters at Herndon, Kans., was formed Dec. 12th with 19 licensed amateurs; 20 XYLS, jr. operators; etc.; and 3 SWLs attending. Officers are UOL, pres.; QHE, vice-pres.; FVD, secy.; KDW, treas.; UTO, activities and entertainment. The KVRG of Topeka

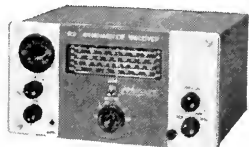
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# System Engineering

## IN *Harvey*-WELLS EQUIPMENT



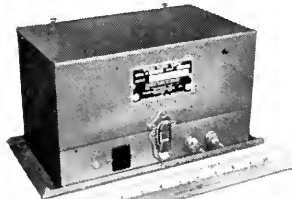
T-90 Bandmaster Transmitter



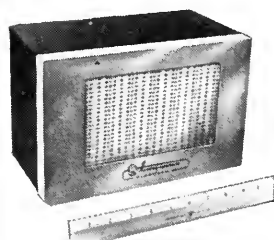
R-9 Bandmaster Receiver



APS-90 Power Supply  
115 V. A.C.



VPS-T90  
Mobile Power Supply



Speaker for  
Fixed Station Operation



Speaker for  
Mobile Operation

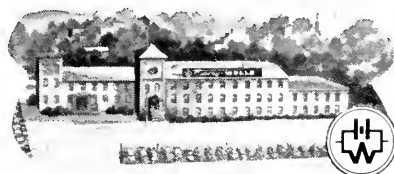
Here at Harvey-Wells, we make communications systems for military and commercial applications, and we believe that Hams too, want their stations complete in every respect. That's the basic thinking behind this new equipment we are introducing. The tremendous success of our TBS-50 Bandmaster has been due in part to the fact that it can be put on the air quickly and efficiently because it is a complete "package" with no additional equipment necessary.

Our new T-90 Bandmaster Transmitter is also a complete "package". It can be on the air five minutes after you bring it home if you so desire, just plug in the power supply and connect the antenna. Our new R-9 Bandmaster Receiver, in its matching case, becomes an integral part by simply connecting the antenna to the T-90.

For fixed station operation, we offer the APS-90 A.C. Power Supply in a cabinet to match. (Just connect to 115V A.C., plug the output cable in the rear of the T-90 and you are ready to go.) The R-9 Bandmaster Receiver has a built-in A.C. supply. For mobile operation we have two vibrator power supplies, the VPS-T90 for the transmitter, and the VPS-R9 for the receiver. Both are convertible for 6 or 12 V operation.

Speakers for either fixed or mobile operation are matched electrically and physically to the R-9 Bandmaster Receiver to complete the system. This new Bandmaster Series is a complete system, engineered for fixed, mobile or portable operation — a system which has beauty as well as efficiency. It's well worth waiting for.

P.S. We are still making the world-famous TBS-50 too!



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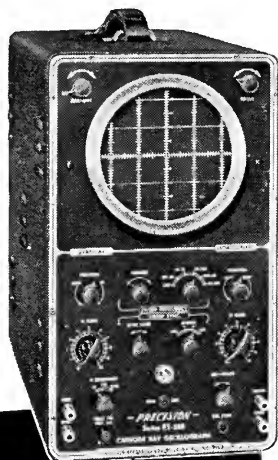
# NOW at last ...

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**PRECISION  
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**5" SCOPE**

priced at only

**\$127.50**



The **NEW**

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MODEL

**PRECISION-Engineered in response to the demand for a low cost, FACTORY-wired FACTORY-calibrated and FACTORY-guaranteed 'scope . . . the new ES-520 fills an important need for every well-equipped ham shack.**

## SPECIFICATIONS INCLUDE:

- ★ Push-Pull vertical drive. 20 mv. per inch sensitivity.
- ★ 3-Step, frequency-compensated, vertical input attenuator
- ★ Vertical freq. response 20 cycles to 500 KC within 2 DB.
- ★ 1 volt, peak-to-peak, built-in vertical voltage calibrator.
- ★ Excellent vertical square wave response from 20 cycles to 50 kilocycles.
- ★ Push-pull horizontal drive. 50 mv. per inch sensitivity.
- ★ Horizontal frequency response 20 cps to 200 KC within 3 DB (at full gain).
- ★ Internal linear sweep 10 cycles to 30 kilocycles.
- ★ Negative and positive sweep synch selection

**Plus** additional engineering and performance features never before incorporated in an oscillograph designed for general application and at such an economical price.

**SERIES ES-520:** In black ripple finished steel cabinet 8 1/4 x 14 1/2 x 16 1/2". Complete with all tubes, including 50P1 CR tube. Comprehensive instruction manual.

Net Price: \$127.50

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held its annual banquet and election of officers Jan. 7th at Lake Linge, choosing KKF, pres.; JLY, vice-pres. and treas.; and UPU, secy. W09YPK and his XYL, YPL, new in Colby, have a Viking Adventurer and an NC-88. FSE has a new Eldico electronic key to help with his traffic-handling. NFX has time for DX as well as traffic-handling. UWV and GDH, of KCK, have new Viking Rangers, as does GTU and ICV, of Topeka. GDH has been QSOing friends he visited in the Caribbean last year. MOX has completed 150-watt final for 6 and 2 meters. SIK, of Topeka, is a newcomer on 2 meters with 15 watts to a 2E26. YUH, of KCK, now in Lawrence, is a new 2-meter station there. The KVCRC's debut on WIBW-TV brought in lots of fan mail and requests for additional shows on amateur radio, which will be given about every six weeks on different phases of our hobby. YJU is YFE's week-day station in Ottawa. BLL, NTV and SIG made BPL Traffic: W0BLI 1320, NTV 480, SIG 223, UAT 172, MXG 163, FSE 151, EOT 97, BET 96, TOL 90, ABJ 78, UNV 58, SVE 53, WXT 41, VZM 40, FBV 39, FDJ 30, KSY 30, ECD 27, TNA 27, NFX 26, LBJ 22, REP 18, LOW 17, ONF 17, VBQ 17, YJU 17, KAJ 13, SBL 10, LIX 9, SAF 8, DEL 6, QMU 6, YFE 6, ICV 4, LQX 4, MLG 2, RXM 2, VGE 2.

**MISSOURI** — SCM, Clarence L. Arundale, W0GBJ — SEC: VRF, PAM: BVL, RM: OUD and QXO. New officers of the Ferguson High School Radio Club are RUK, pres.; TGD, vice-pres.; PWN, secy.; PWO, trustee. SMARC elected NHO, pres.; FGS, vice-pres.; PDR, secy.; BPD, treas.; and QWS, act. mgr. The HARC elected the following officers: NDS, pres.; HJC, vice-pres.; RDI, secy.; and TLV, treas. 9CXI has retired from the Army and is located in Springfield. FLN has installed a 10-20-meter beam, and is conducting code and theory classes for prospective hams. SAK has acquired an NC-173. TGC has a new 10-meter beam. TCF modified his TBS-50D to work all bands with a Heathkit VFO. TWL is installing a new beam and building a 250-watt final. OIV has a new Heathkit VFO. HUI has earned the 2500 Traffickers Club certificate. QMF reports a 2-meter emergency net is being formed to connect with St. Louis. CPI has earned his 27th consecutive BPL certificate. W8UUVI has worked 25 states in the past five months. SUV's automobile accident kept him from being very active during December. WAP is giving A-3 a try with low power. BVL reports EBTN handled over 1200 messages during December. QXO reports KOMU recently carried a very fine ham program. HUI is building a new modulator for his final. BPL certificates were earned by BVL, CPI, FLN, GAR, GBJ, IJS, and KA. Traffic: (Dec.) W0CPI 2402, GAR 1030, BVL 567, CFL 448, IJS 420, KA 325, GBJ 306, FLN 216, ETW 119, ONIM 114, OUD 106, CKQ 95, TCF 86, HUI 77, BZK 73, SAK 63, WAP 53, VPQ 42, EBE 41, KIK 32, ECE 27, BUL 25, RTW 21, SUV 20, TSZ 17, RTO 16, TWL 12, SOZ 11, MFB 10, QMF 10, TGC 10, VFP 10, NHO 7, OIV 7, DFK 5, LMK 5, QXO 4, VTF 2. (Nov.) W0QXO 252, IJS 90, TWL 5, TCF 1. (Aug.) W0ETW 4.

**NEBRASKA** — SCM, Floyd B. Campbell, W0CBH — Asst. SCM: Tom Boydston, 8VYX, SEC: JDJ, NCS RM: HTA, PAM: EUT, DQN has a two-element beam on 15 meters. GDZ is EC for Sidney and DQN is Asst. EC for Potter. K0AIR's total traffic for 1954 was 25,834. K6HIA (ex-W0XL) has been QNI Nebr. C.W. Net regularly. RNH is on the ball for traffic-handling. The following are alternate NCS for Nebr. C.W. Net: Sun. — RNH, Mon. — ZJF, Tue. — KDW, Wed. — FTQ, Thurs. — FQB, Fri. — RDN, Sat. — JDJ. The Net meets daily on 3525 kc. at 1845. New members are welcome regardless of code speed. LJO and NZ are regular reporters for the net with FTQ and RNH as new additions. RHL is having trouble finding a suitable antenna for his Nebraska kw. transmitter. TQD would rather work mobile than fixed. CDL has a signal slicer. New officers of the Ak-Sar-Ben Club for '55 are QMD, pres.; Dick Eilers, vice-pres.; MNM, secy.; NRS, treas. FQB is learning to dip with his Christmas grid-dipper. With 20 hours of operation in the 1954 SS, EHF QSOed all 73 ARRL sections, all 48 states and D. C., all Canadian districts, Hawaii, West Indies, Alaska, and the Canal Zone. ATU is on s.s.b. with 304-TL final and Lakeshore Exciter. Traffic: (Dec.) W0TQD 2348, K0AIR 2279, W0RDN 451, ZJF 343, FQB 217, AEM, 164, HTA 153, BUR 82, KDW 74, RNH 70, FTQ 59, MAO 59, FMIW 37, JHI 32, VYX 32, ERM 29, EGQ 28, QHG 19, FXH 16, PDJ 16, BEA 14, K0FBD 14, W0DQN 13, QHE 12, QMZ 12, HXH 11, IJQN 10, OFL 9, DDP 8, DJU 8, SQA 8, CBH 7, KFY 6, NIS 6, OCU 6, POP 6, GVA 5, NGQ 5, CIH 4, OOX 4, RMO 3, IRW 2, KLB 2, LWK 2, PPT 2, PZH 2, QVV 2, THX 2, VAS 2. (Nov.) W0RDN 249, VYX 33, DQN 4.

## NEW ENGLAND DIVISION

**CONNECTICUT** — SCM, Milton E. Chaffee, W1EFW — SEC: LKF, PAM: LWV, RM: KYQ, MCN and CN 3640 kc., CPN 3880 kc., CTN 3640 kc., CEN 29,580 kc. A report from KYQ shows CN handled a total of 339 in 26 sessions averaging 13 per session, with KYQ, RGB, and LV on the QNI Honor Roll. MCN pushed 249, averaging 9.6 per session, with QNI honors to RGB having perfect attendance and YYM and LV following closely. MCN and

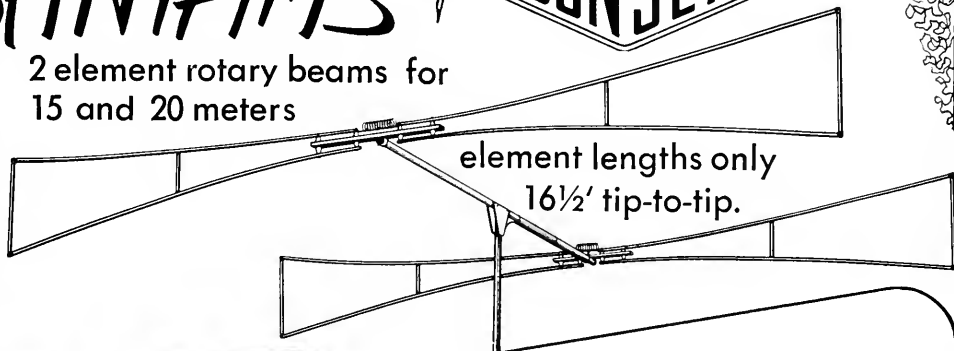
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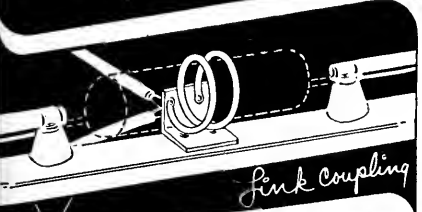
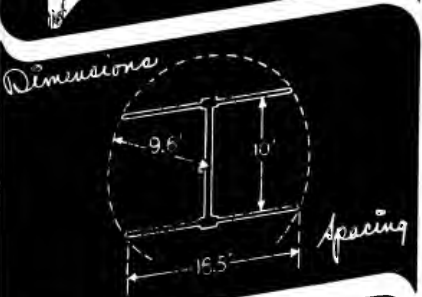
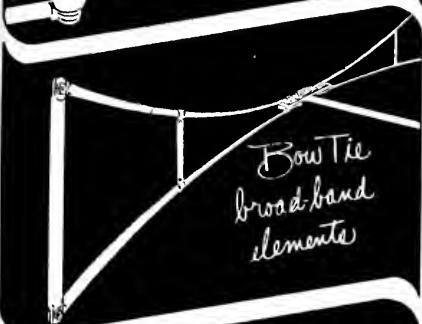
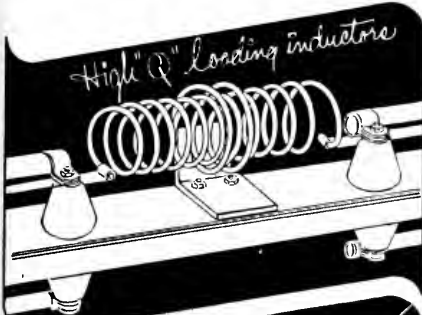
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element lengths only  
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Designing and producing an effective shortened beam, such as the GONSET Bantam, requires skillful engineering and adequate measuring equipment...not intuition

There are certain "Musts". The wholly outstanding performance of the great many Bantams in use today is attributable to many things:

- (1) The very high "Q" coils used in parasitic and driven elements. Silver plated, copper tubing, self-supporting. . . secured only at the ends with highest grade ceramic insulators. Observe that these coils are of ample diameter, that no phenolic or ceramic form is used. For this reason the GONSET Bantam is unaffected by weather. COMPARE these inductors.
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- (3) The effective link-coupled line-to-antenna system permitting use of 52 ohm coax line. . . providing excellent line match and low SWR. . . symmetry in the form of a balanced antenna pattern. The link is "stubbed" for reactance cancellation.
- (4) GONSET does not publish gain figures on the Bantam since these are meaningless unless the reference is clearly and cleanly tied down so that everyone is talking about the same thing. Hundreds of tests conducted under carefully controlled conditions do indicate that the losses in the Bantam have been reduced to a point where performance, including gain and F.B.R. approaches that of a full-length beam. . . IN ALL KINDS OF WEATHER!

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20 METER BANTAM BEAM . . . . . net 59.50

15 METER BANTAM BEAM . . . . . net 59.50

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Model 666R pocket size VOM

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Precision film or wire-wound resistors, mounted in their own separate compartment—assures greater accuracy. Four connectors at top of case, controls, knobs and instrument are all flush mounted with the panel.

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A.C. VOLTS: 0-10-50-250-1000-5000, at 1000 Ohms/Volt.

D.C. MA: 0-10-100, at 250 M.V.

D.C. AMP: 0-1, at 250 M.V.

OHMS: 0-3000-300,000 (20-2000 center scale).

MEGOHMS: 0-3 (20,000 Ohms center scale).

(Compensated Ohmmeter circuit.)

Also available—Model 666-HH Pocket VOM, Net \$24.50.

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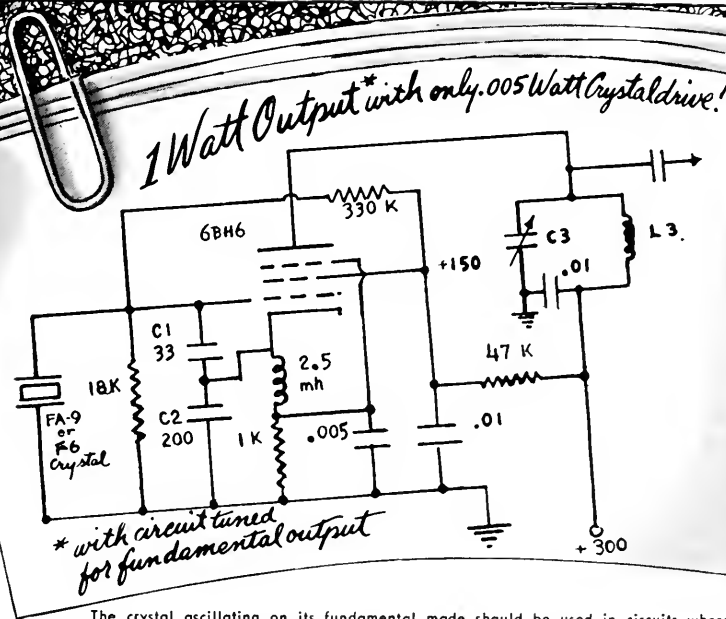


CN provide both morning and evening sessions for ORS to justify their appointments. UIZ furnished the only OES report, telling of 144-Mc. activity and schedules. EDA is active and looking for Alaskan contacts. EJI is the new EC for Bridgeport. EOB reports heavy traffic as he returns from Florida. WNI expects to resume activity when the kinks are out of the equipment. BGP came up with news from the Bridgeport Area: BSE received his General Class license, CRX is a new Novice, SARA has given 11 license exams and conducts code class Tue. nights, MFT showed slides of his recent visit to an SARA meeting, WAV is off to Florida. ADW is busy with c.d. activity but is back on 80 meters as well. GVJ is a new resident of Oakdale and wants OPS appointment. He is teaching at New London High School. IAN managed some time for the SS during a vacation from W.P.I. TD has a new antenna and is working on the big rig while his Official Bulletin schedule is maintained on 146 Mc. CUH has a new 813 final completed and is working on power supply and filter for expected TVI. BDI still is active on RTTY and resuming work on the new final. BFS got all December traffic from the West Haven Veterans' Hospital, where his wife is a volunteer helper. JW reports all his activity is in the v.h.f. region and mostly with c.d. WEE is having trouble getting out with his short antenna but is trying. Thanks to BVB and GIX for OO reports this month. RLN and EJI are new ECs, while RRE and JW renewed appointments. EDA is a new ORS, with renewals by BFS, WPR, ADW, and ZL. Traffic (Dec.) W1YBI 349, KYQ 259, AW 205, CUH 189, BDI 165, YYM 155, LIG 133, RGB 108, LV 100, EPW 99, BVB 76, HYF 58, QJM 51, RFJ 42, KV 28, NEK 26, BFS 19, UED 17, EDA 12. (Nov.) WICUH 160, TSZ 100, EDA 23.

MAINE—SCM, Bernard Seamon, WIAFT—SEC: BYK, PAM; WRZ, RM; OHT. The Pine Tree Net meets Mon., Wed., and Fri. on 3596 kc. at 1900 hours. The Sea Gull Net meets Mon. through Fri. on 3940 kc. at 1700 hours. The Barnyard Net meets Mon. through Sat. on 3960 kc. at 0730 hours. Flash! BTY made the *Portland Press Herald* with a fine picture and a well-written story concerning his valued service to ham radio. ZMO has enlisted in the Air Force and is attending OCS at Wichita Falls, Tex. 6MSH, at Loring AFB, sends an FB letter reporting on activities at K1FCF. With two rigs, a 32V-2 and a BC-610E, and two receivers, a 75A-2 and a BC-342N, Dick and Alan, CEJ, have worked 30 countries. There are a number of other stations active at Loring, also. All the little PTLs were home for Christmas. RWB, formerly of Richmond, now is on 75 meters from his new QTH in Groton, Conn. Three new OBS appointees in Maine this month are JIS, TBZ, and WTG. Your SCM lost his sky hook because of a tired guy wire. VV is on the air from his trailer home in Bingham. The SCM ran into CV in Portland recently. Joe is planning to get back on 75 meters soon. The new EC for the Kennebunk Area is UOT. Traffic: K1FCF 284, W1WTG 282, LKP 127, YYW 84, UDD 80, UZR 31, VYE 28, WRG 25, EFR 18, BX 13, AFT 9, RJL 8, TWR 8, FD 4, KEZ 4, NXX 4.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., WIALP—New appointments: WVD Norton, KEK Lynnfield as ECs; CLF as OBS and OO. Appointments endorsed: MD Hingham, RSE Whitman, MAN Marblehead, MME Hull, KWD Weymouth, RM member of Region 5 Comm. RFE Middleton, SH Dedham, FWS Milton, HRY Wellesley, PYT Ipswich, as ECs; AAR, NBS, BB, and LM as ORSs; AAR, GOU, MME, BB, and RP as OPSs; AAR, GOU, VMD, and BHD as OBSs; CUC as OES; RQZ as OO. 6JUT, ex-1DVC, writes from San Diego that he is on 20-75-meter "phone with 1 kw. s.s.b. BW, BGW, PXH, BGH, BB, MKW, and AYG took part in the November F.M.T. Radio Amateur Open House had Nelson Bragg for an entertainer and TWG gave a talk on TVI. ALP spoke at the Braintree Radio Club. New officers of the South Eastern Mass. ARA are KHV, pres.; ZPE, vice-pres.; LAZ, secy.-treas.; TZU and CNT, directors. AQI writes from 4LEV, Camp LeJeune, N. C. WCI reports that the c.d. group was called out for a bad break in a water main. LLY says that the Arlington 6-meter Net is on Wed. at 9 p.m. on 53.4 Mc. UKO received his BPL Medallion. WPW will have a Viking II. New ham section: BJX, BNZ, CNW, AJII. Novices in Waltham: CZG, CZS, DDN, DIL, DFL, and DIJ. New Tech. Class licensees: COL, CZM, and CWH. Heard on 2 meters: TYZ, ZGO, EAE, QA, ZXH, YBN, WHC, WTK, TON, ARO, ZOC, AMK, AQR, EJE, DGY, CRV, OOD, RTZ, NCO, IKK, SVV, YVB, DJA, LSR, ZHG, WIM, and BYB. QA is working at National Co. W1AAD is on 80-meter c.w. ARG has a TBS-50D. Heard on 10 meters: HSN, 2WAT/M/M, and RKU. JIQ has a Viking II. DFS is now our State Radio Officer and BL is Alternate State Radio Officer. We are very sorry to have to announce the death of PZ, of Lynnfield. ATU is on 40-80 meters with an ARC-5. New officers of the Bedford Radio Club are KJO, pres.; SPL, vice-pres.; YFP, secy.; NAD, treas. The Club has a net on 3600 kc. Thurs. at 1815 kc. with QJB as N.C. The 10-meter Net meets on Wed. on 29,120 kc. at 1900 with DTA and NDI as NCs. KJO gave a talk on transistors, TCG lectured on instruments as used in ham radio. Meeting date is the 3rd Thurs. The Falmouth Amateur Radio Assn. elected TJW, pres.; UXG, vice-pres.; DVS, secy.-treas. TJW has a new 80-meter

(Continued on page 98)



The crystal oscillating on its fundamental mode should be used in circuits where the drive level is limited to 10 milliwatts below 10,000 KC and to five milliwatts between 10,000 KC and 15,000 KC. A circuit meeting these requirements is shown above. The circuit will operate from 2,000 KC to 15,000 KC and limit the drive level to 5 milliwatts. By making capacitor C1 variable the crystal may be adjusted to exact frequency.

The correct load capacitance of the oscillator is extremely important in operation of the crystal, if the frequency of oscillation is to be within tolerance for which the crystal was manufactured.

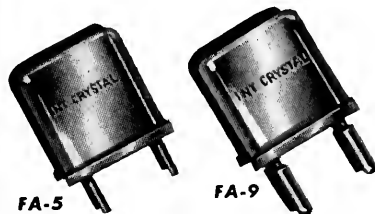
To reproduce 32 mmf precisely, lead lengths and position must be taken into account. Capacitors C1 and C2, together with tube and wiring capacitance determine the frequency. Tuned circuit C3—L3 may be tuned to the fundamental or a harmonic.

## ONE-DAY PROCESSING

### Spot Frequencies 2000 KC to 54 MC

Orders for less than five crystals will be processed and shipped in **one day**. Orders received on Monday through Thursday will be shipped the day following receipt of the order. Orders received on Friday will be shipped the following Monday.

**.01 % TOLERANCE**—Crystals are all of the plated, hermetically sealed type and calibrated to .01% or better of the specified frequency when operated into a 32 mmf load capacitance.



### PRICES

FA-9\* (Pin Diameter .093)\*  
FA-5 (Pin Diameter .050)

Pin Spacing .486 (\*FA-9 fits same socket as FT-243)

RANGE	TOLERANCE	PRICE	
Fundamental Crystals		FA-9	FA-5
2000-9999 KC	.01%	\$2.80	\$2.70
10000-15000 KC	.01%	\$3.90	\$3.80
Overtone Crystals			
(for 3rd overtone operation)			
15 MC—29.99 MC	.01%	\$2.80	\$2.70
30 MC—54 MC	.01%	\$3.90	\$3.80

**HOW TO ORDER**—in order to give the fastest possible service, crystals are sold direct. However, crystals are also available by special order through your local jobber. Where cash accompanies the order, International will prepay the Airmail postage; otherwise shipment will be made C.O.D. Specify your exact frequency and the crystal will be calibrated to .01% or better of this frequency with the unit operating into a 32 mmf load capacitance.

International/CRYSTAL Mfg. Co., Inc. 18 N. Lee Phone FO 5-1163  
OKLAHOMA CITY, OKLA.

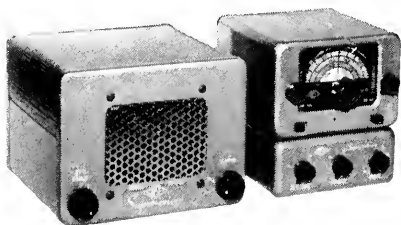
# IT'S SPRING—TIME TO HIT THE ROAD!



by Bill Cummings, W1RMC

The first zephyr of spring gives us the tingles to get on wheels and shift into high gear. Naturally, we take our fellow hams along with us via a honey of a mobile rig just installed in our car. If you're planning an active mobile season, stop by and see our vehicle with a new outfit that has some features you'll find interesting. All you need is the car—we have everything else: dynamotors, filters, receivers, converters, noise clippers, squelches, mounts, loading coils, relays, cable and mikes. While we like the Gonset job featured below, we have lots of other rigs to suit your own ideas on mobile radio.

## GONSET SUPER-CEIVER \$119.95



GONSET SUPER-6	\$ 52.50
ELMAC AF-67 TRANSMITTER	177.00
ELMAC PMR-6A RECEIVER	134.50

Master Mobile and Radelco mounts and whips

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SPruce 7-5555

"Mini" beam. QLT has a new 60-watt VFO rig. YTA has a Heathkit VFO. The South Shore Club had a talk on transistors by A. Whitum. CLF handled traffic for many of the gang from 6ZZ during the holidays. CUC says he will be more active on v.h.f. this year. AAR has a B. & W. 5100. ZVC is C.D. Director for Norton and Asst. EC to WVD. HRY has a Viking II and Meissner 150B. RP has a Lyseo 600S VFO. VJMI, ex-2YAN, of Ipswich, has a Collins 32V-2. AR88, Elmac, Gonset, Tri-Band mobile. VIN, Carlisle EC, says they have 2 walkie-talkies, one mobile, 2 fixed, and 3 portable transmitters. The Wellesley Radio Club meets on the 1st Wed. of each month and has 14 stations on the 2-meter net and 3 mobile rigs. BB reports that they have their 20th crystal unit completed. ATP had a Gonset Communicator while at the hospital. LEM is on 2 meters. ZSS has his General Class ticket. The Area 1 Radio Comm. held a meeting in Cambridge with BL, CQ, QQL, ALP, OTK, IPA, and TQP present. ZYX is the new chairman; KTG is secy. HIL is on 10 and 75 meters with Elmac AF-67 mobile 'phone. New Novice calls in the New Bedford Area are DIY, DIR, and DIV. IPZ and RCJ had their EC certificates endorsed. CAM is a new ORS. Traffic: (Dec.) K1WAB 1329, W1EMG 656, 1BE 606, UKO 530, LYL 270, EPE 231, AVY 97, LM 69, TY 67, UE 56, CLF 28, QLT 19, NUP 14, WPW 10, YTA 9, BY 8, HIL 2, UTH 2. (Nov.) W1QLT 9.

**WESTERN MASSACHUSETTS**—SCM, Arthur Zavarella, W1MNG—SEC: CJK, RM: BVR, PAM: QWJ, WM C.W. Net meets on 3560 kc. Mon. through Sat. at 1900 EST; WM 'Phone Net on 3870 kc. Mon., Wed., and Fri. at 1900 EST with representation into C.W. Net for through traffic. New ECs are MSN, Russell, and WDK, Bernardston. SPF, Radio Officer and EC for Worcester, has a new QTH in Rochdale with able assistants AAP and JNA. RO gave a convincing demonstration of s.s.b. to QRM-riden A.M. operators on the Sunday Morning N.E. Net (3870-0900 EST). SRM was elected a director of HCRA, Inc., and not PGQ as previously reported. UKR continues her traffic trek with BPL again this month, complete with medallion. The team of WCV and WDK are keeping K1WAV in the BP "League." IINE is back on WMN after a vacation on 20-meter 'phone. Santa and Dame Foretune presented 20As to AVK and VBG, 75A-3 to ARA, SX-88 to BKG. BYH has a new Globe Scout and MARS call. NPL recently received a QSL from Hungary dated 1951. ICG and family were featured in *Sickles Digest*. IIT and KFY are working 40-meter c.w. QXV is back on 2 meters. Also active on 2 meters are TAY, ZWL, TDS, and OY. F.M.T. results show MUN leading RLG, QGO, and JYH with an average error of only .01 p.p.m. AMI, MND, and ZEL are helping to keep WMN on top from Worcester County. LJQ is doing likewise for Hampshire. MJD, MKD, and ZEO are toying with s.s.b. and will be welcome in the WM 'Phone Net. BH and MNG got "Slicer" kits. BVR checked into the WM 'Phone Net with traffic! RAD and SRM are collaborating with veteran news hawks PHU and RRX in *Zero-Beat* production for HCRA, Inc. Club-sponsored license examiners are BVR, NY, RRX, VNE, HRV, MOK, RLV, WLE, MNG, and SRM. Old-timers CND and KJB re-appeared on 10 meters. Traffic: W1UKR 652, WCG 240, K1WAV 162, W1WCC 144, BVR 107, SRM 78, MNG 62, WEF 36, TAY 34, RRM 31, WDK 31, DVW 19, WDW 17, BYH 14, BKG 9, UVI 6, JAH 4, ABD 3, BH 3, QWJ 2, ZEO 1, ZIO 1.

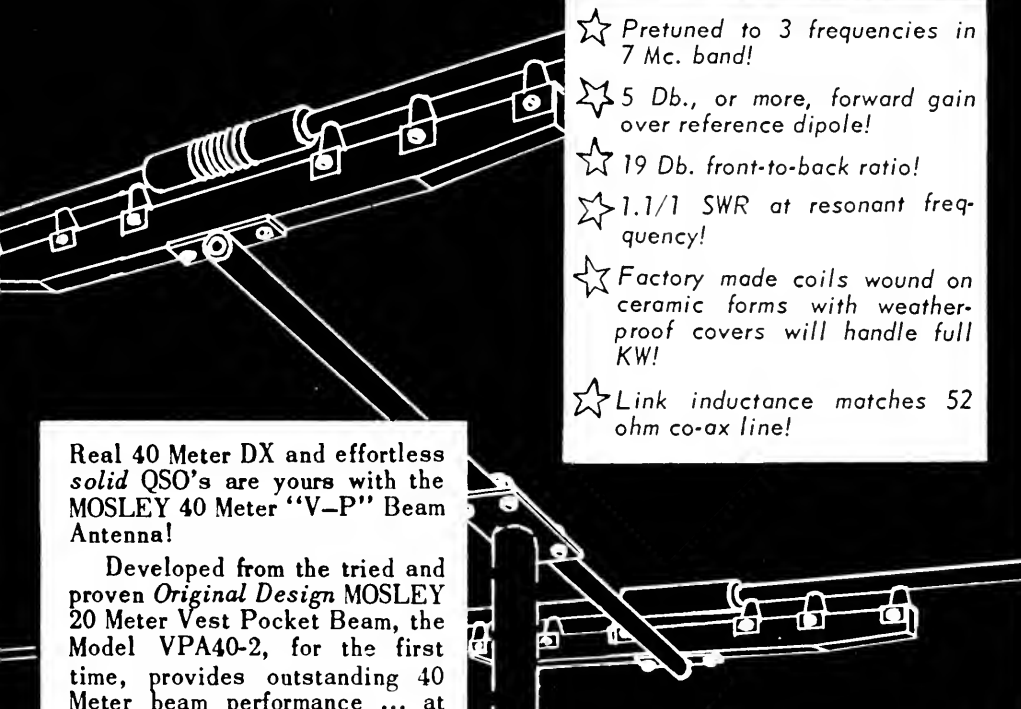
**NEW HAMPSHIRE**—SCM, Harold J. Preble, W1HS—SEC: BXU, RM: CRW, PAM: AXL, LVG was presented with twin-girl tax exemptions for Christmas. Concord Brasspounder officers for 1955 are SSK, pres.; RVQ, vice-pres.; HS, secy. We welcome the following New Hampshire Novices to radio: BYS, BQK, BQM, BQO, BXM, CAZ, COE, CCQ, CJE, CKE, CLY, CMV, and CFL. RCEN has openings for stations in Exeter and Hampton. ARR recently worked VP7NM on 80-meter c.w.; he also received a certificate as New Hampshire high scorer in the W/VF Contest. GMH now has sky wires for all bands 80 through 10 meters. COC reports good activity and coverage on the New Hampshire Slow-speed Net, including Coos County. TBS is attending Massachusetts Radio School. Look for him on YS. POK received a new mike from Santa. CDX is trying out the Heathkit transmitter and has 5 continents so far. VES is Acting NCS of the New Hampshire Slow-speed Net Tue. New ORS appointees are ARR and VZS. TNO/1 puts out an FB signal on 10-meter 'phone on the summit of Mt. Washington and is worked regularly by stations all over New England. He has a 2-meter rig also. Traffic: (Dec.) W1GMH 217, COC 118, CDX 57, WUU 57, IIS 18, VZS 12, ARR 9, FZ 8, CCE 6. (Nov.) W1CDX 302, POK 11, FZ 7.

**RHODE ISLAND**—SCM, Walter B. Hanson, jr., W1KKR—SEC: TQW, RM: BTV, PAM: VXC. All nets did a great job in handling the usual flood of Christmas traffic. BIS has a new Viking. BIL put up new beams with cold hands to get ready for the Sweepstakes. YKQ built and is using a cavity resonator for TVI elimination on 2 meters and reports sensational results. 4CVO/1 measured 26 parts per million in Frequency Measurement Tests. ZPH has built several 2-meter mobile transmitters and receivers as

(Continued on page 100)

FOR "40"

## 2 Element, 40 Meter MOSLEY VEST POCKET BEAM

- 
- ★ Pretuned to 3 frequencies in 7 Mc. band!
  - ★ 5 Db., or more, forward gain over reference dipole!
  - ★ 19 Db. front-to-back ratio!
  - ★ 1.1/1 SWR at resonant frequency!
  - ★ Factory made coils wound on ceramic forms with weather-proof covers will handle full KW!
  - ★ Link inductance matches 52 ohm co-ax line!

Real 40 Meter DX and effortless *solid* QSO's are yours with the MOSLEY 40 Meter "V-P" Beam Antenna!

Developed from the tried and proven *Original Design* MOSLEY 20 Meter Vest Pocket Beam, the Model VPA40-2, for the first time, provides outstanding 40 Meter beam performance ... at low cost and with an array of convenient size and weight!

### SPECIFICATIONS

- 14'10" Tubular Steel Boom with factory welded element support plates.
- 36'1 $\frac{3}{4}$ " Maximum Element Length. (61S-T6 alum. alloy.)
- 68 lbs. Assembled Weight.
- Element Sections and Element Supports pre-cut, pre-drilled for fast assembly.
- Sturdy 3" Ceramic Insulators and extra long Redwood Supports minimize element sag.

MODEL VPA40-2, MOSLEY 2 Element 40 Meter "V-P" Beam, less 52 ohm coax line, rotor and mast.

AMATEUR NET **\$74.95**

Other MOSLEY "V-P" Beam Antennas include: Model VPA20-2, 2 Element, 20 Meter, Amateur Net \$55.95; Model VPA20-3, 3 Element, 20 Meter, Amateur Net \$79.95.

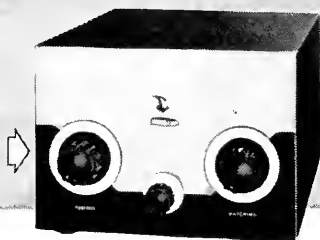
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## JOHNSON "MATCHBOX" ANTENNA COUPLER



### BANDSWITCHING—

for greater flexibility

### RECEIVER MATCHING—

for improved receiver performance

### EFFICIENT POWER TRANSFER—

from transmitter to antenna

Bandswitching on 80, 40, 20, 15 and 11-10 meters, the compact and self-contained "Matchbox" performs all transmission line matching and switching functions required in medium power amateur stations. Its revolutionary circuit design does away with the annoying use of "plug-in" coils and completely eliminates "load-tapping," necessary in other antenna couplers.

Almost an infinite variety of antennas in the 3.5 to 30 mc. range can be loaded with the "Matchbox". Balanced antennas from 25 to 1200 ohms resistance can be matched, while unbalanced, or single wire antennas within the range of 25 to 3000 ohms resistance can be successfully loaded. In addition, the "Matchbox" will tune out large amounts of reactance.

Nominal input impedance is 52 ohms—may be used with any transmitter having 250 watts maximum power input, and a PA plate voltage not exceeding 1000 volts. Tuning and loading is easily accomplished with two convenient front panel controls—all connectors located at the rear of the unit.

Attractively finished in maroon and grey—supplied as an assembled, wired, and pre-tested unit. Complete operating instructions included. Dimensions: 9 7/8" wide, 10 1/2" deep, 7" high. Weight approximately 6 pounds.

Catalog Number 250-23.... **\$49.85**  
Amateur Net



**E. F. JOHNSON COMPANY**

289 SECOND AVENUE SOUTHWEST • WASECA, MINNESOTA

shown in April 1954 *QST*, and all reports are terrific. ZPG is heard on all bands with his new B. & W. New ORSs are ZXA and YAO. The FRA has been issued the new call of OP and the gang is rebuilding transmitters for installation at the new headquarters, if and when. Contact VXC for OPS appointment and TQV for EC. Your SCM could use more reports on station activities or club functions. The silence from SKT is deafening. Election results of the FRA are SGA, pres.; KKR, vice-pres.; KKE, treas.; VZP, secy.; TQW, corr. secy. Traffic: WICDV 101, BTV 100, UTA 67, VXC 67, YKQ 29, ZXA 22.

**VERMONT**—SCM, Robert L. Scott, W1RNA—SEC: SIO. PAM: RFR. RM: OAK. Vermont nets operate on 3860 and 3520 kc. Those interested in AREC, please contact your local EC or Andy. SIO. BRG is working hard on getting the necessary information and machinery in motion to have license tags acted on. Word as to what you can do to help will be passed along as soon as things have reached that stage. KJG hopes to have new GG final on shortly. ETE has recovered from a bout with pneumonia. Traffic: (Dec.) W1OAK 196, RNA 173, AVP 90, BJP 53, IT 38, TEW 37, BNV 32, FPS 21, TAN 17, JLZ 10, KJG 3. (Nov.) W1KJG 7.

## NORTHWESTERN DIVISION

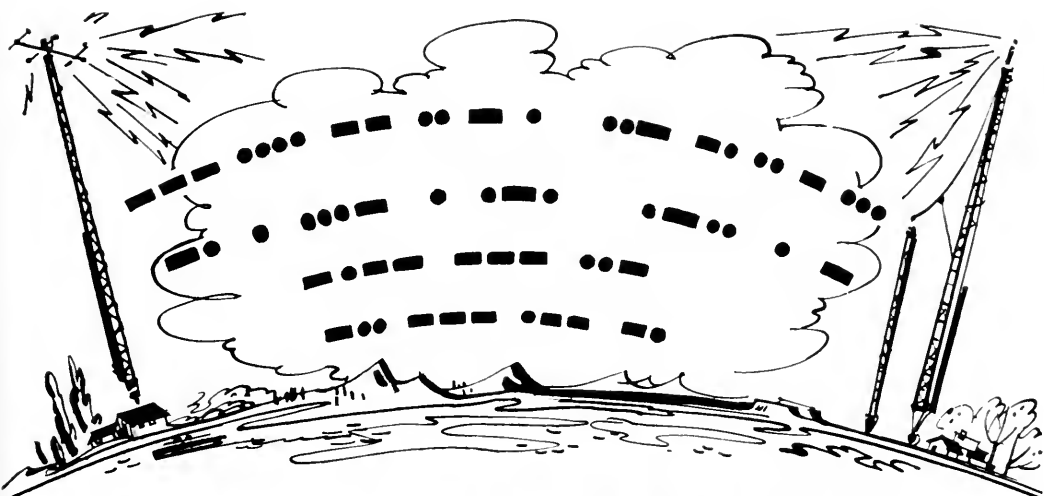
**ALASKA**—SCM, Dave A. Fulton, KL7AGU—The Anchorage Amateur Radio Club held a Christmas Party for all the hams in the Anchorage Area. There was a very good turnout with about eighty-two attending. We have received a few inquiries in regard to reactivating the Sourdough Net on 75 meters. Anyone interested in seeing this net run as a traffic outlet and in a business-like manner, please drop us a line and we will see what can be done. We have heard a rumor from a pretty reliable source that there will be a KL7 certificate out soon. This certificate will be awarded to anyone working ten KL7s in the various parts of KL7-Land. It will be sponsored by the Anchorage Amateur Radio Club and as soon as we can we will have full details. BK is in Fairbanks getting KTVF on the air. TVI here we come! It's not too bad, fellows, so far no TVI problems here in Anchorage.

**IDAHO**—SCM, Alan K. Ross, W7IWU—Lewiston: IDZ reports on the local gang. New officers of the Lewiston-Clarkston Amateur Radio Club are GMC, pres.; UJA, vice-pres.; TLW, secy.-treas.; and NOG, reporting secy. VIO has a Heathkit VFO, while IDZ assembled a Viking Adventurer. OWG is driving a new Ford. WNTYBV is running 16 watts to a 40-meter vertical. Caldwell: EYR has a new Viking II and antennas for 75, 40, and 20 meters. Kellogg: RQG has to let up on ham radio because of travel and extra work. RSQ is giving s.s.b. a lot of thought. Bonners Ferry: VMF, the 13-year-old son of QC, worked Norway for 32 countries. Boise: NVO is trying to tame the ARC-4 front end. AXV and BMF still are on s.s.b. OZJ and YAD are on 75 meters a lot. Two meters is very active. MWP, on Deer Point, 7000 feet up, can work Twin Falls on 2 meters. This band is to be encouraged for local c.d. work, and also gives a good chance for DX through MWP. Traffic: WTYG 39, NVO 4, EYR 2.

**MONTANA**—SCM, Leslie E. Crouter, W7CT—Long-skip conditions have prevented both the Montana Phone Net and the Montana State Net (c.w.) from having any contacts after the late afternoon during the past month. FUB has substituted as NCS a few times for the South Dakota Net. BSU was located at the new QTH in time for the November SS Contest. SFK is operating from a new ham shack (studio A). Ray is using s.s.b. with 20A exciter. EWR reports 14 charter members in the new Hi-Line Radio Club at Havre. NZJ and KUH have started a series of local on-the-air chess games. MM has been working hard to get Montana aligned for ham call letters on auto license plates. NPV reports the following new hams in Harlowton: YFH, YHB, and YHC. WDE is a new ham in Winifred. WSE, ex-0PPJ, from Valley City, No. Dak., now lives in Lewiston. JRG is doing considerable experimenting on 132 Mc. Ken has a new balanced modulator for 3.9 and 50.4 Mc. using 832A. Your SCM has been promoted and will be located in the capital city of Helena by the time this goes to press. Traffic: (Dec.) W4SFK 75, MQI 15, CT 13, FUB 11. (Nov.) W7MM 105, EWR 3, NZJ 3.

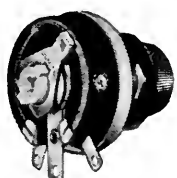
**OREGON**—SCM, John M. Carroll, W7BUS—Officers of the Rogue Valley Radio Club are ISP, pres.; VCQ, vice-pres.; EZR, secy.; LNG, treas.; TZP, technical advisor. SBT is active on 2 and 6 meters. QMK is Asst. EC in the Medford Area. ISP is net control on the 29.5-Mc. Net. KTL is putting up an all-band vertical. APF renewed his membership in ARRL. The *OARS News Letter* is a fine letter and should be subscribed to by all the Portland bunch. QBT is building a new QTH. AIHZ has moved to Denver. SY has an office in the State Office Building. MNS is working on RTTY gear. The Tillamook gang has a club room in the basement of the City Hall. RQN beat THX out on the DX recently. QKN is on 2 meters. VLJ and YFK have registered with AREC. KTF has purchased an old school house up in the mountains for a summer QTH and is taking applications for his PTA. BUS has ordered an s.s.b. rig. Traffic: (Dec.) W7APF 1679, JHA 668, QKU 418, VIL 128.

(Continued on page 108)



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Small sizes—5, 10, and 20 watts. Five larger sizes to 200 watts.



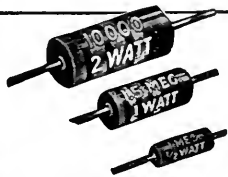
**DUMMY ANTENNA RESISTORS**  
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**FREQUENCY-RATED PLATE CHOKES**  
It's easy to select the right unit for all frequencies. Seven sizes, 3 to 520 mc.



**DIVIDOHM® ADJUSTABLE RESISTORS**  
Wire-wound, vitreous-enamelled. Adjustable lugs. Seven sizes—10 to 200 watts.



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Reports tell the story of GOTHAM BEAM performance—the gang says you can work more DX in a day off a GOTHAM BEAM than in a year off a wire or dipole. GOTHAM BEAMS are strong, too; easy to assemble and install, no special tools or electronic equipment necessary; full instructions included, matching is automatic; maximum power gain built into the design—AND ALL AT LOW, LOW, PRICES.

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## 2-Meter Beam Kits

GOTHAM proudly presents a 6 element Yagi beam for 2 meters at only \$9.95. Contains a 12 foot boom, 1" alum. tubing; 3/4" alum. tubing for elements; Amphenol fittings; all hardware, and instructions. Vertical or horizontal polarization, terrific performance!

And GOTHAM's new 12 element Yagi for 2 meters at only \$16.95! Contains a 12 foot boom, 1" alum. alloy tubing; 3/4" tubing for elements; all Amphenol fittings; all hardware, and instructions. Vertical or horizontal polarization, multiplies your power by 32!

## 10 M. BEAMS

**S103T • Std. 10m 3-El. T match.** \$18.95. 1—8' Boom, 3/4" Alum. Tubing; 3—6' Center Elements, 3/4" Alum. Tubing; 6—6' End Inserts, 3/4" Alum. Tubing; 1—T Match (4'). Polystyrene Tubing; 1—Beam Mount.

**D103T • DeLux 10m 3-El. T match.** \$25.95. 1—8' Boom, 1" Alum. Tubing; 3—6' Center Elements, 1" Alum. Tubing; 6—6' End Inserts, 3/4" Alum. Tubing; 1—T Match (4'). Polystyrene Tubing; 1—Beam Mount.

**S104T • Std. 10m 4-El. T match.** \$24.95. 1—12' Boom, 1" Alum. Tubing; 4—6' Center Elements, 3/4" Alum. Tubing; 8—6' End Inserts, 3/4" Alum. Tubing; 1—T Match (4'). Polystyrene Tubing; 1—Beam Mount.

**D104T • DeLux 10m 4-El. T match.** \$30.95. 1—12' Boom, 1" Alum. Tubing; 4—6' Center Elements, 1" Alum. Tubing; 8—6' End Inserts, 3/4" Alum. Tubing; 1—T Match (4'). Polystyrene Tubing; 1—Beam Mount.

**HOW TO ORDER:** Remit by check or money-order. We ship immediately by Railway Express, charges collect; foreign shipment cheapest way. 10-day unconditional money-back guarantee.

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## 15 M. BEAMS

**S152T • Std. 15m 2-El. T match.** \$22.95. 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 3/4" Alum. Tubing; 2—5' End Inserts, 3/4" Alum. Tubing; 2—7' End Inserts, 3/4" Alum. Tubing; 1—T Match (6'). Polystyrene Tubing; 1—Beam Mount.

**D153T • DeLux 15m 3-El. T match.** \$39.95. 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 2—5' End Inserts, 3/4" Alum. Tubing; 2—6' End Inserts, 3/4" Alum. Tubing; 2—7' End Inserts, 3/4" Alum. Tubing; 1—T Match (6'). Polystyrene Tubing; 1—Beam Mount.

## 20 M. BEAMS

**S202N • Std. 20m 2-El. (No T).** \$21.95. 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/4" Alum. Tubing; 1—Beam Mount.

**S202T • Std. 20m 2-El. T match.** \$24.95. 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/4" Alum. Tubing; 1—T Match (8'). Polystyrene Tubing; 1—Beam Mount.

**D202N • DeLux 20m 2-El. (No T).** \$31.95. 2—12' Booms, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/4" Alum. Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

**D202T • DeLux 20m 2-El. T match.** \$34.95. 2—12' Booms, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/4" Alum. Tubing; 1—T Match (8'). Polystyrene Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

**S203N • Std. 20m 3-El. (No T).** \$34.95. 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/4" Alum. Tubing; 1—Beam Mount.

**S203T • Std. 20m 3-El. T match.** \$37.95. 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/4" Alum. Tubing; 1—T Match (8'). Polystyrene Tubing; 1—Beam Mount.

**D203N • DeLux 20m 3-El. (No T).** \$46.95. 2—12' Booms, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/4" Alum. Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

**D203T • DeLux 20m 3-El. T match.** \$49.95. 2—12' Booms, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/4" Alum. Tubing; 1—T Match (8'). Polystyrene Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

QE1 58, THX 50, OMO 47, AJN 34, PRA 22, KTL 3. (Nov.) W7VIL 35, QE1 28, ESJ 27.

**WASHINGTON—SCM.** Victor S. Gish, W7FIX—ATTENTION ALL WASHINGTON SECTION CLUBS: This section is in need of a Section Emergency Coordinator and more active ECs. Each club not now having an active EC, please nominate one and send his name and QTH to your SCM so that appointments can be made. At the Dec. 9th meeting of the North Seattle Radio Club FRU was presented with the Chif Cavanaugh Award for the award 1954—a de luxe Vibroplex presented annually to the WSNet operator who contributes most to c.w. operating in the section. FRU brought over some clippings from his home town paper with reprints from the year 1900, showing his name as a member of the high school class who built and demonstrated a "wireless set." This should get George membership in the "Old Old Old Timers Club." The NSARC is installing a 2-meter beam on the club station for e.d. use. KZ is trying 40-meter DX for a change. AIB insists that conditions are the worst he has ever seen. ØSQQ/7 reports from Everett. AMC got the XYL a TV set for Christmas! OE reports from Dalesport, Wash.; next stop is Bellingham. AVM (Aberdeen) is working BTV (Olympia) consistently with converted 522 on 2 meters. PRZ was home on Christmas vacation from Cornell U. to visit the OM, ZU. K6BDF/7 says conditions are so bad in Washington that he can't hear QRM. BMK reports better results by replacing the Windom antenna with a half-wave doublet. ULK worked 66 YLs in 19 states in the YLRL Party. TIQ is working 20-meter DX. AVM is RACES Radio Officer for Aberdeen. OUK is with c.d. in Whatcom County. OEB still is working shifts—tough on traffic. PHO, DET, and OZG are going for kw. rigs. 6PZG/7, now in Seattle, is working 80-meter traffic. UQY reports new Richland hams are YFO (ex-6PNK) and NIZ. TGS now operates club station KLAIZ on Adak and is going to try to hook up with RN7 on 3575 kc. with 450 watts. LVB reports his OM (6HTN) is sending him components for a half-gallon c.w. rig. TGO has a 66-ft. vertical for 80 meters. GAT burned out his power transformer. Traffic: (Dec.) W7BA 2303, PGY 1945, K7FAE 729, W7VAZ 508, FIX 178, KZ 162, EHH 127, WØSQ/7 98, W7RXH 81, UMC 75, RXH 62, APS 59, AIB 41, JY 37, UZB 24, AMC 23, VCF 21, WEV 18, FWD 16, OE 14, TGO 10, AVM 8, ZU 8, EVW 6, K6BDF/7 4, W7BMK 4, GAT 4, ULK 3, TIQ 2. (Nov.) W7FRU 879, KT 52, AVM 1.

## PACIFIC DIVISION

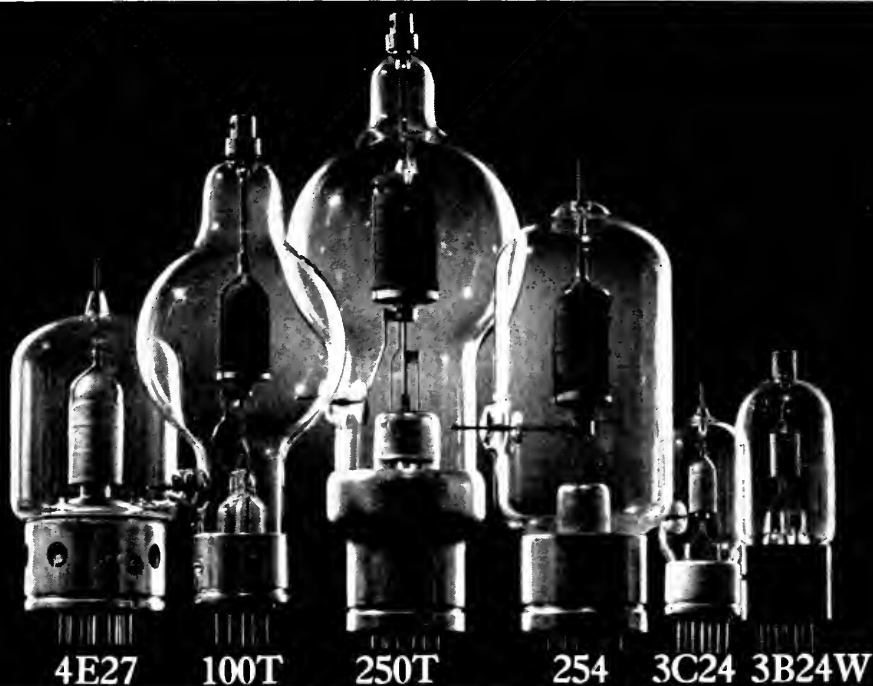
**NEVADA—SCM.** Ray T. Warner, W7JU—ECs: PEW, PRM, TVF, TJY, and ZT. OPs: JUO and UPS. ORs: MVP, PEW, and VIU. OBS: BVZ. Nevada State Frequencies: 'Phone—3880 and 7268 kc.; e.w.—3660 and 7110 kc. PRM is now EC for Boulder City. TVF is EC for Las Vegas. How about backing these fellows with an increase in AREC activities? More and more of the gang are showing on the above chosen Nevada frequencies. The demand for Nevada QSLs appears to be heavier than ever! TVF now has 50 Nevada QSLs! The Southern Nevada Amateur Radio Club (SNARC) now has 42 paid-up members. VIU thinks a lot of his Viking II since working ZK1BG on 80-meter c.w. JUO fabricated a beautiful copy of the Gonset Commander. Traffic: W7VDC 43, VIU 35, JU 16, IJ 9, SNF 9.

**SANTA CLARA VALLEY—SCM.** R. Paul Tibbs, W6WGO—MKM, San Mateo, sends in the following report. The San Mateo Radio Club elected the following new officers: INN, pres.; K6DM, secy.; ABE, treas.; and MKM, board member. TPZ is installing a 144-Mc. antenna trying for DX on v.h.f. K6DM is active on 7 Mc. using a vertical for transmitting. There have been no new cases of TVI reported to the TVI committee in San Mateo from the FCC office for the past three months. INN has a kw. on the air now. FON again is a grandpa on the birth of a girl to K6HIGJ, the XYL of VZT. Oh, yes, the uncle is AVJ. WLL, very active as an OO, was elected secretary of the SARO at its December meeting. K6BBD has been appointed OBS. Dick would like skeds with stations in Maine, Delaware, Vermont, and North Carolina. NOG decided that two could work 144 Mc. as cheaply as one and acquired an XYL in December. YHM is using an HQ-140X now. RN6 and PAN still can use operators, so any of you who have just lost your Novice call and now have a General Class license, get in touch with HC in San Jose. Harry will start you on the road to some pleasant hours operating with some very swell amateurs, some new and some old. Anyone who happens to be in the vicinity of San Mateo the 2nd Wed. of each month, drop into the Fiesta Building, attend the club meeting, and meet all the San Mateo gang. Traffic: W4YIP/6 1615, W6YHM 652, HC 472, UTV 200, AIT 85, K6BAM 57, BBD 11, W6WLI 10.

**EAST BAY—SCM.** Guy Black, W6RLB—Asst. SCMs: Oliver Nelson, 6MXQ, for v.h.f.; and Harry Cameron, 6RVC, for TVI. RMs: IPW and JOH. PAMs: LL. ECs: CAN, CX, FLT, QDE, TCU, ZZF, and K6ERR. Once again the many radio clubs in the East Bay section report having highly successful Christmas Parties. The Mt.

(Continued on page 104)

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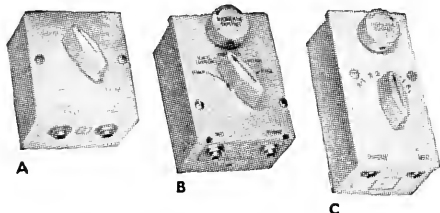


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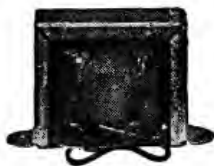
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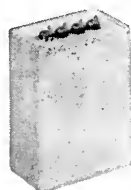
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Diablo Club's Party was outstanding and unusual in that it was an affair for the kids, but there was nothing wrong with the other parties either. The Skyriders Net came to the rescue of three persons trapped in a wrecked car in an isolated area of San Mateo County on Jan. 5th. DEG's new QTH is Memphis, Tenn. When the weather turns cold think of JIG, whose QTH is 5064th Cold Weather Material Testing Squadron, APO 731, Seattle. The Napa County CD has some Gonset Communicators and is obtaining crystals on 147.11 Mc. CAN's appointment as Emergency Coordinator for the Napa AREC has been renewed. Wayne reports a Napa AREC Net at 9 A.M. Sun. on 3885 kc. 9QOM now is organizing K6FDJ at Parks AFB and is getting additional equipment. BAO and BAT are now 432-Mc. mobile. VSV wants to try pulse modulation on 1215 Mc. — as soon as it's legal. EE has retired as head of Oakland Civil Defense. A real amateur himself, Shell believed strongly that civil defense should rely heavily on amateur participation and he put his belief into words. His civil defense communication system was a pace-setter for the Bay Area. Hope you enjoy relaxing, Shell. The Official Observers of the East Bay section are PSL, JZ, HBF, CTL, RLB, EY, YDP, WOC, CBE, NGC, ITH, BEZ, and LTI. HBF reports he has his BC-459 going on 40-meter c.w. JHV now is high power on the low frequencies. VS reports being QRL lately. Your SCM was treated royally by the ARRL Headquarters gang when he dropped in on the West Hartford office during the Christmas season. It would be a thrilling experience for any ham. Traffic: (Dec.) K6FDG 1294, W6QPY 807, K6GK 449, W6LPW 118, EFD 80, LL 44, ASJ 36, HBF 25, EJA 24, VSV 4. (Nov.) K6GK 119, W6EFD 62, JOH 60, ASJ 36, ITH 31, HBF 19, K6CCQ 1.

**SAN FRANCISCO — SCM, Walter A. Buckley, W6GCG** — The San Francisco Radio Club held its annual Christmas Party the 3rd Fri. in December. A good time was had by all. The HAMS Club has changed its regular meeting night to the 1st Fri. of each month so that the boys also can attend the Oakland Club meetings which are held the 2nd Fri. The San Francisco Naval Shipyard had its Christmas Dinner at Grotto 9, Fisherman's Wharf, with a good show of hams. The Tamalpais Radio Club now holds its monthly meetings at Novato. The Marin County Radio Club had a large group show up for the season's dinner held at El Verano. The Young Ladies Radio Club of SF prepared and served the food for the SF Radio Club Party. The 29ers lost another of its group, K6ALF, to Uncle Sam's Navy. The Humboldt Radio Club members were all on the alert during the big shake. K6FKI was in town mobile when it happened and contacted GL, in Crescent City, who was first to give the news to the Crescent City broadcasting station. Both Eureka stations were off because of power shortage. K6DVV, W6CNG, and BME all gave reports to VRG, in Oakland, to give to the *Oakland Tribune*. CNG and ULF held a circuit for a time for emergency railroad traffic but none was required. However, many messages were handled because of overcrowded telephone lines. The Club held its Christmas Party in lieu of its regular meeting and reports a fine time was had by the group. AEY let the stove in his ham shack get overheated so now he has a hole through the roof. OPL received lots of help erecting his V-37 antenna on Dec. 5th. ATO, BON, GGV, GQA, GTY, HST, OCZ, OST, TLN, TMF, and K6CWS all helped and report the best antenna-raising feed ever held. ZYL and PW did within a few days of each other during the holiday season. CBE reports that he is going low power and is building a 40-watt rig. YC has been handling traffic from Japan, usually on Sun. SWP has been having trouble, high noise level is wrecking his reception. Congratulations to QMO on the BPL total for December. ACN reports that the Bill for the ham license plates renewal was introduced on the legislature floor the first day of the new session at Sacramento. GHI is new representative for the HAMS at the Central California Council meetings. PHT has a new TV and radio store in San Francisco. Lots of luck and success in your new venture — "CYN's TV & Radio Shop." A local amateur made the headlines in the San Francisco newspapers and radio broadcasts on Dec. 5th. He was driving on a very lonely road down the country shortly after a car went into the ditch and trapped three people. By means of his mobile rig he was able to bring help to them very quickly. WD, Arthur Hart, certainly let the people know of the good deeds amateurs can do. Local papers gave Arthur a real nice write-up. Traffic: W6QMO 710, PHT 668, SWP 226, GGC 82, YC 14, GQA 3.

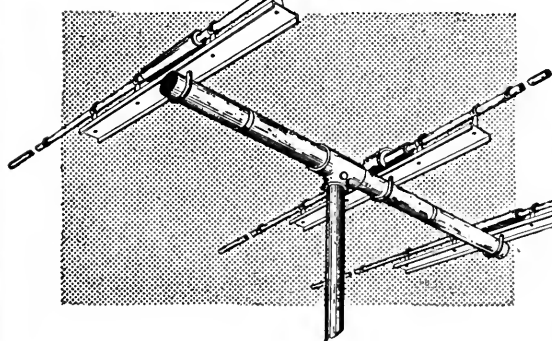
**SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN** — Fellows, let's build this section to one of the best during 1955. It can be done with the help of all of you. The Annual Christmas Party of the Sacramento Amateur Radio Club proved to be a big success. ILZ acted as master of ceremonies. The following served on various committees: DIE, GIE, HGW, IOY, JEQ, QKJ, RNR, VKT, ASI, LLR, VBU, and BTY. Six Heathkits were awarded as prizes and the main prize, a Globe Scout, was won by AK. ASI is constructing a Linear. OPY is active on traffic nets. MIV is active on 144 Mc. LLR has a BC-610 and is on 75 and 40 meters. ILZ completed the kw. final. JEQ, c.d. coordinator, announces the Sacramento Communications Plan is on its way to FCDA and FCC. K6CNA is active

(Continued on page 106)

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### 15 Meter, 2 Element Shortbeam

6 ft. boom. Forward gain 4.4 db over full size reference dipole. Front to back ratio 15 db. Tuned 21,350 Kc. Approximate wt. 15 lbs. Longest element 13 feet.

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### 15 Meter, 3 Element Shortbeam

12 ft. boom. Forward gain 4.8 db over full size reference dipole. Front to back ratio 20 db. Tuned 21,350 Kc. Weight approximately 20 lbs. Longest element 13 feet.

MODEL R.S. 3-15  
AMATEUR NET

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### 40 Meter, 2 Element Shortbeam

12 ft. boom. Forward gain 4.4 db over full size reference dipole. Front to back ratio 15 db. Tuned 7250 Kc. Weight approximately 30 lbs. Longest element 33 feet.

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40 Meter Shortdublet coils—7200 Kc.—16 feet—32 feet total. 80 Meter Shortdublet coils—3900 Kc.—31 feet each leg—62 feet total.

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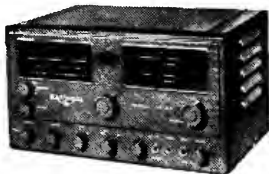
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R-F Wattmeter—Useable Frequency Range—From 500 KC to 30 MC.  
Power Rating—100 Watts Continuous—125 Watts Intermittent.

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with a Globe Scout on 75 and 40 meters. CMA has duels as excitor-frequency standard. K6FR is on mobile. RNR is having trouble in the 4-250A final. KKI has a new portable unit. QDT is going back to s.s.b. KQJ is experimenting with indoor antennas. MARS officers at McClellan AFB are HIR, pres.; ESZ, vice-pres.; LIR, secy. AK has a new Twin Yagi on 144 Mc. QYQ is active on 75-meter mobile. AD is active on 75 meters. FNS is sporting a new car and mobile set-up. OPY is on 'phone at times with a Viking. TYC is doing nicely with the PAM job. SBH, of Red Bluff, really puts out the Official Bulletins. BH reports that SM60B is operator aboard the *Silver Gate*, running between Europe and W-Land to VEO-Land. 5QDF/6 made BPL Traffic: W5QDF 6 1464, W6OPY 82, MWR 56, JDN 10, TYC 3.

**SAN JOAQUIN VALLEY** — SCM, Edward L. Bewley, W6GIW — SEC: EBL, RM: K6BGM, PAMs: ZRJ and WJF. As in the past, the holiday season brought a heavy load to the traffic nets, and this section carried its share of the load. BPL awards were issued to K6FAE, W6ZJR and W6FEA. BRAT awards went to K6EVM, K6BGM and W6ZJR. EXH was awarded a Meritorious Medal Award by the Ground Observer Corps in recognition of his work with the 2-meter group in San Joaquin County. The Trowel Club held its Third Annual Winter Hamfest in Fresno, and it was a big success. Newly-elected officers of the Stockton Club are HQY, pres.; K6CZO, vice-pres.; W6PJF, secy.; DBH, treas.; RKN, sgt. at arms. KN6HWT, the blind boy sponsored by the Stockton Club, is now on 2 meters. DVI qualified as Class I Observer in the last Frequency Measuring Test. RLG has been selected as EC for San Joaquin County. ADB is on s.s.b. with a 10B exciter driving a pair of 837s in grounded grid amplifier at 300 watts. Traffic: (Dec.) K6FAE 2206, W6ZJR 514, GJO 265, FEA 207, ADB 136, K6EVM 88, BGM 60, W6SJJ 24, EBL 23, TXM 4, WJF 4. (Nov.) K6FAE 638.

## ROANOKE DIVISION

**NORTH CAROLINA** — Charles H. Brydges, W4WXZ — CVX is still working DX on 20 meters. The best so far for Tom is VK4. ONM reports that 2-meter activity is lively in Greensboro. The gang in Greensboro now has an emergency generator. SGD has been busy with nets. Katherine recently completed YL-WAS and is waiting for her certificate. ZKE has a B&W transmitter. A new Novice in Wadesboro is KN4BED, using a Globe Scout and HQ-140X. Others in Wadesboro are 5JYB/5 and W4CSH, who are with Air National Guard. DLX is about to get his basement finished. ZMG was NCS of the Tarheel Net for the month of January. FUS did a swell job during the hot month of December. BUD has a new Viking and is working out FB. Some of you should get on 2 meters. There is a very good net in Winston; also a good net over the State. SOD is signing up AREC members in Lumberton and also in the adjoining counties of Bladen and Hoke. You fellows who are not signed up, get in touch with SOD. Ex-451Y now is VP7NW and is looking for Winston-Salem stations. YBQ reports RACES is being organized in the Statesville Area. How about more reports from you ECs? Many thanks to all for sending those great monthly reports. They sure do make the job much easier. Traffic: W4WXZ 612, RRR 90, BTZ 52, BDU 34, CVX 8, YPY 6, BUA 4, SGD 4, YBQ 2.

**SOUTH CAROLINA** — SCM, T. Hunter Wood, W4ANK — PED is back on the air on 80-meter c.w. NJG has installed an Elmac mobile transmitter. LXX is ORS and reports that FGX is working DX on 20 meters. ERG is EC for Bamberg. AKC has an A-1 Operator certificate and reports the following reporting into the C.W. Net: AKC, ANK, CHD, HMG, LLI, KTL, KYN, MVX, RPV, TDJ, TTH, UFP, UWA, WJH, WP, WKZ, YAA, ZIZ, ZJY, ZKU, and K4AQQ. The S.C. C.W. Net meets at 7 P.M. Mon. through Fri. on 3525 kc. A joint meeting was held between the Columbia and Charleston Clubs with NJG, president of the Greenville Club, TTG, EC for Orangeburg, and groups from other parts of the State in Columbia on Jan. 6th. Organization of clubs in South Carolina and the value of ARRL membership was discussed. The feature of the meeting was presentation of the Corn Cob trophy to the Columbia Club by the Charleston group as a consolation prize for making low score in the '54 Field Day. The Charleston group had received the Corn Cob as a result of losing the 1954 transmitter hunt. It was mounted on an engraved walnut placard with an ancient key and Marconi antenna. ZRH is transmitting code practice and Official Bulletins on 3700 kc. at 7 P.M. nightly using tape-keyed 800-watt transmitter. Traffic: W4AKC 334, K4AQQ 144, W4ZIZ 126, ANK 79, RPV 18, MVX 7, EDQ 4, SOY 4, TTG 4, HMG 1.

**VIRGINIA** — SCM, John Carl Morgan, W4KX — Santa seems to have done well by the gang. IA reports he and jr. operator TFX now have new Viking II and 75A-3 to play with. CGE has new BW-5100 and 576. Others found various hunks of swell gear in their socks. YE and No. 1 jr. operator YZC are building all-band, half-bucketful rig with separate finals for each band. YE's 11-year-old passed his Novice Class exam and is awaiting his call. KFC says he worked countries No. 98 and 99 on 80 meters. Vic also reports visits from W4KVM/V06 and KH6YL. 3WDP, who

(Continued on page 108)

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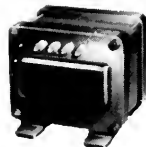
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400/500	250	325	P-45	R-63	R-103
600/750	250	325	P-67	R-63	R-103
1250 and 400	150	200	P-1240	R-63	R-63
	200	260		RS-8200	RS-12200



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Type FS. Heavy duty cast frames

D.C. Volts	DCMA CCS	ICAS	Plate Trans-former	Choke No. 1	Choke No. 2
2100/2600	500	700	P-2126	R-65	R-105
2500/3000	500	700	P-3035	R-65	R-105
3000/3500 and 4000	600	800	P-4353	R-67	R-67



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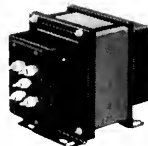
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D.C. Volts*	DCMA CCS	ICAS	Plate Transformer	Choke
1000	225	280	PT-8311	C-1412
1000	325	405	PT-8312	C-1414
1500	225	280	PT-8314	C-1412
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D.C. Volts	DCMA CCS	ICAS	Plate Trans-former	Swing-ing Choke	Filter Choke
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1250/1500	500	625	P-8029	C-1405	C-1415
1750/2000	500	625	P-8033	C-1405	C-1415
2000/2500	500	575	P-8035	C-1405	C-1415



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has kept K4MC hot, has overseas orders. 3LEZ reports he operated from Front Royal during the SS. ZFV is too busy at school for hamming, and his "Hazelized" antenna at home still is just junk wire. SVG made BPL on originsations as a result of promoting traffic at the Service Men's Club. 3QQE continues busier than a bee in a tarbucket at PFC as his 2247 traffic total for December will testify. LW reports activity on VON is booming, with 16 different stations QNI in December. If conditions continue on 80 as they have been, we'll all have to move up there to 160 meters, Dick, or resort to smoke signals. BLR says OM BVB built 'em a new 813 rig. OMV reports duty at WSVA-TV's mountaintop transmitter cuts into hamming. WBC reports MARS Net No. 3 staked out mobiles at shopping centers in the Arlington Area to promote traffic for overseas servicemen and 75 messages were handled via K4AF, EBH, now in a new wig-wam, still has no antenna, but has been so busy running ground radials he has more copper in the ground than Anaconda. The SVARC should be in its new club building by the time this appears. Traffic: W4PFC 2247, SVG 216, OMV 121, YKB 100, KX 82, YZC 70, DWP 46, DBE 43, CFV 35, RJW 32, KFC 29, BLR 25, BLR 18, TYC 16, LW 14, CGE 10, JAU 10, TFX 10, WBC 10, IA 9.

**WEST VIRGINIA** — SCM, Albert H. Hix, W8PQQ — WNSSNG is doing very well toward his WAS with 15 watts on 80 meters. BOK was active in the last 'phone CD Party. PZT and JWX visited HZA, PQQ, and the Princeton group in December. I am sorry to report the passing away of ex-MZD, of Clarksburg. HZA is putting up a real long wire for 80 meters. He has been working good European DX on this band. QHG is coming right along on his new 500-watt rig. ING handled lots of traffic from the Morgantown Hobby Show. ETF is on 6 meters along with HI. VCT is back from Texas and is active now. FOJ will have his kw. s.s.b. rig going soon. ZJS skeds ex-DMF, who is now in Florida. NLT is getting ready to put up a 15- and 20-meter three-element beam system. LS is doing a good job mobile. CLX has a Ranger and is active now. FOJ will have his kw. s.s.b. rig going soon. ZJS skeds ex-DMF, who is now in Florida. NLT is getting ready to put up a 15- and 20-meter three-element beam system. LS is doing a good job mobile. CLX has a Ranger and is active now. The Tri City Club has been meeting lately at the South Charleston Naval Reserve Armory. Guests are certainly welcome. Your SCM would appreciate receiving more information for this section. GEP is very active on the various nets and does a bang-up job. Traffic: (Dec.) WSGEP 137, JWX 126, HZA 69, NYH 44, ETF 36, KDQ 21, DFC 18, IXG 18, PQQ 6. (Nov.) W8DFC 25.

### ROCKY MOUNTAIN DIVISION

**COLORADO** — SCM, Karl Brueggeman, W0CDX — SEC: MMT. RMs: KQD and KHQ. PAM: IUF. The statewide drill was a success, with stations from all over the State reporting to net control with members of the legislature in attendance. AEE handled the net control, assisted by WIR and MMT. Our bill has been introduced and has been turned over to the transportation committee for action. We must now contact the members of that group in order to keep them reminded of our needs. Also all must write their legislators so that they won't forget us when it comes time to vote on the bill. If you need more copies of the bill, contact IC and he will send them to you. IUF made BPL with 102 originsations. EKQ reports that the CSSN is doing find and a new ham in Littleton is W9WNJ. The Hi-Noon Net handled 437 pieces of traffic in 21 sessions. HOP has a new rig running 500 watts on c.w. Congratulations to the Trout Route Mike and Key Club on its affiliation with ARRL. New officers are MMP, pres.; Muriel Schwarz, vice-pres.; Ray Wilhelm, secy. We all want to give the MARS stations in the State a vote of thanks for the fine way that they are working with our amateur groups. They have brought our traffic totals up to a very respectable figure and can always be counted upon to help us whenever we need it. Traffic: K6FDX 4821, WBB 2529, W0KQD 1334, YGB 782, IUF 200, PGN 93, YQ 83, BWJ 52, LNH 48, EKQ 46, TVI 41, IC 35, WGB 31, IA 23, SWK 19, HOP 9, TVB 6.

**UTAH** — SCM, Floyd L. Hinshaw, W7UTM — TVL is busy looking for a new QTH, hoping for room for a new ham shack. 9VZQ is a regular visitor to W7-Land, flying United planes from Chicago to Salt Lake. QDM is now being pushed into a rebuilding program since receiving a new 6-ft. rack for Christmas. BLE still is commuting from Salt Lake to Denver, but says slick roads and mobile operation do not fit together too well. SP has nearly forsaken low-frequency contacts for 2 meters — not nearly as much QRM on 2 meters! MWR has a potent signal with new 500-ft. skywire. Traffic: W7PIM 111, UTM 35.

**WYOMING** — SCM, Wallace J. Ritter, W7PKX — NVX, president of the Casper Club, reports the club house is nearly completed, with console operating position and Viking Ranger two-thirds installed. JSS visited IWF and LLP while in Sheridan. NVX visited PKX to arrange for relay of bowling scores. QNR recently hooked his 65th country. PJX has plans for a 813 final. LLL, recently-appointed OBS, starts schedules following the Pony Express Net. PAV's stolen 10-meter mobile was found in unusable condition. The Sheridan Club will go 2-meter mobile in the near future with rigs designed and engineered by LVU. QPP and LLP are "prospecting" on 2 meters. PKX holds

(Continued on page 110)



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$$\begin{aligned} \frac{\partial (e_3 E_v)}{\partial v} - \frac{\partial (e_2 E_v)}{\partial \omega} &= -j\omega e_3 e_2 H_v \\ \frac{\partial (e_3 H_v)}{\partial v} - \frac{\partial (e_2 H_v)}{\partial \omega} &= j\omega e_3 e_2 E_v \\ \frac{\partial (e_2 E_v)}{\partial v} - \frac{\partial (e_1 E_v)}{\partial \omega} &= -j\omega e_2 e_1 H_v \\ \frac{\partial (e_2 H_v)}{\partial v} - \frac{\partial (e_1 H_v)}{\partial \omega} &= j\omega e_2 e_1 E_v \end{aligned}$$

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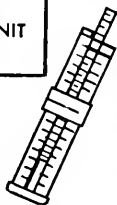
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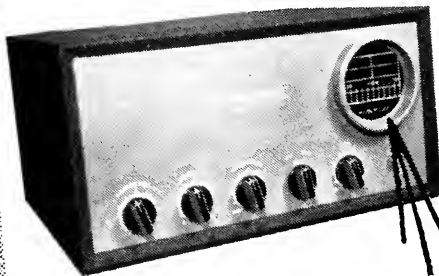
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### SOUTHEASTERN DIVISION

**ALABAMA**—SCM, Joe A. Shannon, W4M1—SEC: TKL RM: KIX. PAM: RNX. Welcome to the Valley Amateur Radio Club in Lanett! Officers of the new club are PHY, pres.; KPJ, vice-pres.; CHO, secy.; FL, treas.; VUO, act. mgr. The Club presently is working on a training program and organization of an emergency net for the area. The Birmingham Club has a new slate of officers headed by WJX, the Club's first XYL president, YYJ (also an XYL), 1st vice-pres.; ZSQ, 2nd vice-pres.; KNW, secy.-treas.; YEG, rec. secy. CRY has moved to Cullman and is back on the air after a short stretch of strictly mobile operation. YAI now meets a total of six nets. We welcome the following newcomers to the Florence Area: KN4s ARD, AUP, AVA, K4AEN, W4EVJ, and KN4BEQ, jr. operator of TXO and now working on General Class. TKL now is mobile on 2 meters—145.35 Mc.—and is waiting for others to join in. ZSQ has s.s.b. going and has revamped the operating position. OAO is on with Viking I in Anniston. Traffic: (Dec.) K4FDY 1897, W4UHA 950, WOG 780, COU 646, KIX 189, YNG 139, YAI 101, DXB 73, K4ACO 62, W4YRO 59, TXO 39, TKL 22, ZSQ 19, BRE 14, MI 14, VYI 11, ZSH 11, OAO 10, BFM 9, RNX 8, W5ONL/4 6, W4DDP 4, HYI 4, PWS 4, (Nov.) W4UHA 363 (correction), W5ONL/4 18, W4CAH 15, W4HW 12.

**EASTERN FLORIDA**—SCM, John W. Hollister, jr., W4FWZ—Sorry, gang, but a double-barrelled shot of the flu got me. The December report will be confined mostly to traffic reports. AQJ and OLA have new 20-meter beams. Club notes—Jacksonville: JARS officers are UHE, WEO, TRN, AGT, and NKC. Ft. Lauderdale: BARC officers are JZB, LRMI, PM, EUV, and CQP. Traffic: W4PU 916, DVR 699, BMY 606, WEO 196, TJU 140, WS 135, LAP 118, K4ANJ 101, W4AWY 94, HCQ 79, LMT 76, DSC 58, IM 47, ZIR 44, RWMI 43, TRN 41, FSN 39, TKE 39, IYT 33, YOX 32, CQP 27, ELS 24, DES 8, FJE 5, FWZ 5, PBS 5, WEM 3, DRT 2, YNM 2, YW 2.

**WESTERN FLORIDA**—SCM, Edward J. Collins, W4NS/W4RE—SEC: PLE. ECs: HIZ and MFY. JPD has the new B&W. 5100 going. AIA keeps Marianna represented on 75 meters. BGO is on s.s.b. MS has the 250THs going s.s.b. BFD is interested in ham-TV. BGG is working DX on 21 Mc. KN4AEP has a new receiver. GMS had BCI from over a hundred a.c.-d.c. sets in the dormitory. ZFL is a DX hunter. The Pensy Amateur Club had a wonderful Christmas Party. DAO/DEF has a new NC-183. QK has a pair of 813s on 75 meters. HGO is using cathode modulation on 75 meters. UUF still is working 144 Mc. UYS is after 144 Mc. PAA has a new 32V-3. FHQ and VR keep true to 7-Mc. c.w. RZV is kingpin of the Dagwood Net. KN4AGM raises too many stations on her CQs. NOX/NYZ keep traffic rolling out Bohemia way. SOQ is thinking s.s.b. 9CPI/4 wants s.s.b. for his 5100. GMS wants kw. final for the Ranger. Traffic: KN4AGM 5, W4AXP 3.

**GEORGIA**—SCM, George W. Parker, W4NS—SEC: OPE. PAMs: ACH and LXE. RMs: MTS and OCG. Nets: Georgia Cracker Emergency Net meets on 3995 kc. Sun. at 0830, Tue. and Thurs. at 1830 EST; Georgia State Net (GSN) meets on 3590 kc. Mon., Wed., and Fri. at 1900 EST, Georgia Traffic Net meets on 3920 kc. at 0745 EST, daily except Sun. New appointments: FYC as EC for Lamar, Pike, and Monroe Counties; TGM as OO Class IV, K4FEP as OPS and ORS. EMR is new in St. Simons and is mobile with an Elmac. The Warner Robbins Club took part in the collection of toys for underprivileged children. New officers of the Club are ØRV, pres.; 5RDP, vice-pres.; K4AYT, secy.; K4ASP, treas. New hams in Moultrie are KN4ANZ and KN4APC. FGH is building a new kw. final. HYW has new kw. finals on all bands and has BERTA, WAA, 101, and CAA DX awards. FZO has a new VFO. DYR is new in Temple. DDY, in Lincolnton, is active on 75 and 80 meters. OCG reports some traffic handled on the GSN but still needs outlets in the south and central parts of the State. BYJ is active on 20- and 40-meter c.w. in Savannah. PFF reports a new club being formed in Dublin. The Atlanta Club Christmas Party was a big success. The principal guest and speaker was 1BUD. The Atlanta Hamfest will be held on May 28-29 this year with all the usual attractions. Traffic: (Dec.) K4WAR 831, W4OCG 341, BVE 218, IMQ 158, BWD 139, DDY 92, ZWT 72, CFJ 66, MTS 30, NS 28, ZD 10, DYR 6, FZO 4, (Nov.) W4YRX 114, MTS 40, HYW 16.

**WEST INDIES**—SCM, William Werner, KP4DJ—SEC: HZ. WR transmits Official Bulletins Mon., Wed., and Fri. at 7:30 P.M. AST on 3925 kc. DV transmits Official Bulletins on 1810.4 kc. Mon., Wed., and Fri. at 7:15 P.M.

(Continued on page 112)

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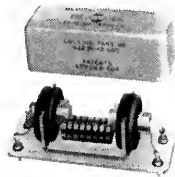
Furnished with a removable perforated steel panel for mounting such control functions as beam direction indicators, clocks, switches, etc. A light on the top of the panel provides general illumination for the operating desk. A 10" speaker is mounted on a sub-panel behind this front panel. A terminal strip across the bottom of the open rear provides connecting points for control units. Complete with 10" PM speaker.....

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## 35C-2 LOW-PASS RF FILTER

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## 75A-4



## KWS-1

## 32W-1 EXCITER

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**Dimensions:** 10 1/4" h x 15 1/2" d x 17 1/4" w.

## 75A-4 RECEIVER

A further improvement of the famous, earlier 75A receivers, redesigned and modified to include SSB reception as well as AM and CW. Covers 160, 80, 40, 20, 15, 11 and 10-meter bands.

**Features Include:** Double conversion . . . Permeability-tuned, hermetically sealed VFO . . . Crystal controlled first injection oscillator . . . Mechanical filter in IF strip . . . Fast attack, slow release AVC . . . Separate detectors for SSB and AM . . . Band-pass tuning . . . New noise limiter circuit . . . Bridged-T rejection notch filter . . . Built-in crystal calibrator . . . Fixed 455 kc IF . . . Low frequency converter stage with VFO . . . Provision for 3 Collins plug-in mechanical filters.

**Dimensions:** 10 1/2" h x 17 1/4" w x 15 1/2" d. Weight: 35 lbs.

Complete with tubes (less speaker)..... **\$59500**

See Control/Speaker 312A-1

## KWS-1 TRANSMITTER

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The KWS-1 actually consists of a 32W-1 Exciter with its power supply replaced by a 367A-1 Linear RF Power Amplifier, plus a 428A-1 High Voltage Supply and a 429A-1 Low Voltage Supply, housed in a supporting cabinet. Covers 80, 40, 20, 15, 11 and 10-meter bands. Pi-L tank circuit with ganged condenser and tank coil permits continuous tuning over entire frequency range. RF Amplifier employs two 4X150A tubes, operating Class AB1.

Other features are identical to those found in 32W-1 Exciter . . . including mechanical filter . . . VOX and push-to-talk operation . . . hermetically sealed VFO . . . RF feedback . . . Accurate dial calibrations, etc.

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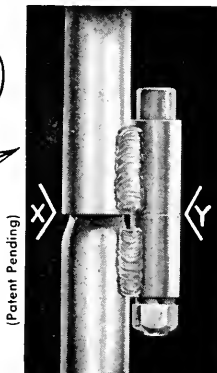
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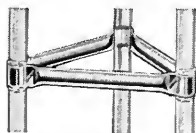
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AST. AAB uses Millen 75-watt transmitter on 144 Mc. AAA spends most of his time on 7 Mc. ABA, ABD, and ABI are on 3.7 Mc. AZ overhauled the HRO-5. DJ put up a 40-ft. all-band vertical. AAC interviewed Capt. Kurt Carlson of the *Flying Enterprise II* on WAPA-TV. KD worked E19J, G5RI, G5JU, T12BX, YV5DE, and LU3EL on 160 meters. DV, CC, and TF also are on 160 meters. W2AOX, of the *New York Herald Tribune*, is in San Juan writing a story. Senator Bauza, who backed the license plate bill, now is WP4AAS. VC's son is WP4AAT. MP is on with a kw. The first call at Polytechnic Institute is WP4ABJ. US is using cathode modulation and new antennas on 75 meters. DP is on 20-meter 'phone with new kw. and 75A-3. WD is working DX since he erected Telrex 20-meter beam. OS is giving code classes at home. WT, Dona Maria, has a new antenna on 75 meters and is heard S9 in San Juan. HZ built a 2-meter transmitter. RK received his WAC certificate. CZ operates c.w. on 3.7-Mc. mobile. Officers of the Borinquen RC, renamed the Ramey ARC, are ABE, pres.; WW, vice-pres.; ZW, secy-treas. Theory classes are held Tue. at 7:30 p.m. code classes Thurs. 7:30 p.m. AAZ, Base Commander of Ramey AFB, operates aeronautical mobile. ZD has a new 75A-3. ZA, ZQ, and ABE have Viking Rangers. ABS has a TBS-50. Traffic: (Dec.) KP4ZW 14, AAC 6. (Nov.) KP4ZW 5.

**CANAL ZONE** — SCM, Roger M. Howe, KZ5RM — NM has been appointed OPS and OO (Class III). BR and KA have their maritime mobile certificates. BE has new 813 rig and HRO-60. JJ has 10-over-15-over-20 array up. The SS *Rangitata*, bound for England, produced visitors on its last trip through the big ditch in the persons of Roy, ZL1AKL (also G3AYL), and his very charming XYL, Christine. They were met at the dock by GF, FL, ML, DG, GD, RV, KA, and RM. The party went from the dock to the home of KA and RM, where they enjoyed some very nice refreshments provided by KA and DG. Later in the evening RV took the party on a motor tour of the Pacific side of the Canal Zone and returned the visitors to their ship about midnight. Mil, GF's XYL; Virginia, RV's XYL, and Dorothy, DG's sister, also were in the group. WA reports working double 'phone patch with W4KAH on 14 Mc. using s.s.b. on the W4 end with very good results. Traffic: KZ5WA 115, KA 38, DG 25, BE 13.

## SOUTHWESTERN DIVISION

**LOS ANGELES** — SCM, Howard C. Bellman, W6YVJ — QJW, our SEC, calls to our attention the fact that more than 1400 have signed up in AREC in the section but that this figure should be near 5000 to handle emergencies properly. Howard points out that we need top c.w. and 'phone operators to man the control centers. HKD, Asst. SEC and EC for San Bernardino (also Radio Officer for Region 8 RACES), reports that the Hq. is set up under the call JBT, auspices of the Citrus Belt Club. The Fish Net, with "Kingfish" TDW presiding, held its annual Christmas affair. CMN, RM of SCN, informs us that 83 different stations handled 407 messages during December. Check in SCN some night at 1900 on 3.6 Mc. This is our official section net. The Frequency Measuring Test held in November brought three Class I qualifications: CBC, CK, and YVJ. Qualification twice a year in this manner is necessary to hold Class I and II Official Observer certificates. K6DGW is 14 years old and is a sophomore at South Gate High School. He runs 50 watts on c.w. on 80 and 40 meters. K6COP, also 14, has a rig on all bands and is a new OO. EBK conducted a Novice Class examination and now we have WN6ISX in our midst. The examiner, Johnny, loans a complete station to Novices until they receive their General Class licenses. KN6GKW has been given a taste of traffic-handling via QR and GYH. Your writer received several non-standard letters this month, including one from Scotland. R. S. Bruce, formerly of Glendale, is returning here in March or April of this year after operating GM3GVI. ORS comes through with a report. NRY is on 428 Mc. with a BC-788. The "First Annual Report" of the United Trunk Lines, West Division, has arrived from ELQ. It talks about the first year of operation and lists its members: 1 in Arizona, 10 in California, 3 in Washington, 1 in B. C., and 2 in Alaska. ELQ, the Manager, shows message totals from Nov., 1953, to Oct., 1954, which add up to 15,207. For point-to-point traffic Ed invites one and all to drop down to 3570 kc. 1915 to 2115 nightly. MLZ is acting as liaison between UTL and RN6. GYH reports that KP4ZW, ex-W6PWZ, sends 73 to the RN6 and SCN gang. Reporting from Minnesota is K6EA, who brags of having two SCMs. ZDO has finished his 1215-Mc. receiver and antenna. Carl has started test transmissions on 431.5 Mc. at 8 p.m. nightly. CFL still wants a buddy on the 2400-Mc. band. Traffic: (Dec.) K6FCZ 2245, FCY 1043, W6LYG 740, CMN 560, USY 356, BHG 212, NCP 192, K6EA/8 148, W6GYH 104, GJP 88, K6DQA 78, W6FMG 70, MBW 51, MLZ 46, YAS 46, ORS 32, CK 30, HKD 29, K6BEQ 26, W6FAI 24, KN6GKW 12, K6COP 10, W6CBO 9, AMI 3. (Nov.) GJP 26, W6TRF 23, PZN 5. (Oct.) W6GJP 19.

**ARIZONA** — SCM, Albert H. Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH; Dr. John A. Stewart, (Continued on page 114)

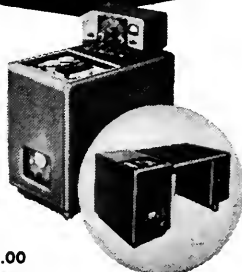


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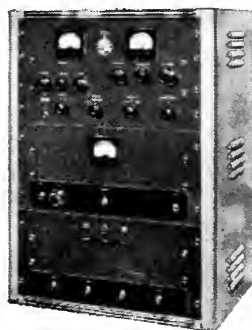
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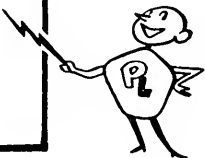
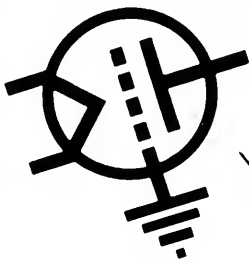
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7SX. SEC: VRB. PAM: KOY. Arizona 'Phone Net: Tue. and Thurs., 7 P.M., 3865 kc. Arizona C.W. Net: Tue. and Thurs., 6 P.M., 3690 kc. This report is a combination of November and December activities. The 14th Mobile Amateur Hamfest was held in Casa Grande, but because of poor weather conditions only RYS, UDI, USX, and QZX were present. The OPRC had fine programs by NYT on "Mobile Installations," and Bob Dobinsky, of Minneapolis Honeywell, on "Controlled Circuits." It is rumored that Douglas Area is setting up a "Local Net" on approximately 3914 kc. The OPRC hidden transmitter hunt was won by QHD and QHT. RG is back on 75 meters. SUI has moved to Ohio. QZX has been appointed Asst. SEC. MES has a new Elmac transmitter and receiver in the car. IRX has moved to San Francisco. QZH has been elected to the board of directors and is president of the AARC. GSKC has moved to Glendale. PEY is back on the air with Viking Ranger, 183 receiver, and 10 and 15 beams. New calls: YGZ and YCU. Last minute scoops: Call letter license plates are now being issued to those who made application last June. The Montezuma Well Hamfest will be held May 21 and 22. Contact GYK or OAS for tickets and information. Traffic: W7LVR 18.

**SAN DIEGO** — SCM, Don Stansifer, W6LRU — Asst. SCMs: Tom Wells, 6EWU; Shelley Trotter, 6BAM; Dick Huddleston, 6DLN. SEC: VFT. ECs: BAO, BZC, DLN, HFO, HIL, HRI, IBS, KSI, KUU, and WYA. RM: ELQ. Our thanks to Roy Maxson, DEY, who has done such a good job as EC for Orange County, and has now resigned. His place has been taken by Bob Swenson, HIL. Congrats to the operators of IAB who handled 8593 messages during December, also BSD with 3227 and YDK with 3226 — a total of 15,046 for these three stations. New officers of the Silvergate Club are K6CTQ, pres.; KN6GSF, vice-pres.; KN6ITB, secy.-treas. KN6IIR got an HQ-140 and an Elmac transmitter from Santa. SYA is now on 144 Mc. with a Communicator. The Coronado Club made 119,062 points in the SS Contest with 7 stations participating. OGY will complete the term of K6AZW as corr. secy. of the Coronado Club. The San Diego Club is now incorporated. The Convair Club has completed its classes and many KN6 calls are evidence of its fine work. A night school class at Hoover High is starting, with KRO as instructor. K6CTQ now has a Ranger, thanks to Santa. We note the passing of Buddy Ascher, OZH, after a long illness. He was active on 28-Mc. 'phone for many years. KN6IWS and IWU are new Novices in the Silvergate Club. CAE is building a new final, pi-net, all bands, 4-250A final. QCA and KJR were home for Christmas. K6AAJ is heard working DX on all bands. Traffic: W6IAB 8593, BSD 3227, YDK 3226, IZG 788, ELQ 626, KVB 50, K6DBG 42, HZO 38, W6CHV 5, CRT 3.

**SANTA BARBARA** — SCM, Vincent J. Haggerty, W6IOX — K6NBI (Mac, DBY, operator) reported traffic via radiogram which was delivered to the SCM by JPP. QIW, reporting from the Ventura Area, says ERU is getting out fine with a new skyhook. MWA has 100 watts going on 2 meters. REF is moving to Oxnard. FYW reports the Paso Robles Club purchased a Viking I kit which MSG and MSW are assembling. THA also has a Viking I kit. NKT submitted an OO report. W3RNY/6, operator at K6CST in Pt. Mugu, received ORS appointment. OQX reports a new s.s.b. rig in operation. New Santa Amateur Radio Club officers are K6ATX, pres.; W6JCQ, vice-pres.; K6EAG, rec. secy.; W6AET, corr. secy.; W6ULS, treas.; K6BVZ, sgt. at arms; K6CJR, W6OQX, and W6SNI board of directors. Traffic: K6NBI 141, W6QIW 33, FYW 3.

### WEST GULF DIVISION

**NORTHERN TEXAS** — SCM, T. Bruce Craig, W5JQD — SEC: RRM. PAMs: PAK and IWQ. RMs: PCN and QHI. Santa brought LGY a Jr. Weller Soldering gun and a Heathkit VFO. WN5FBE's father died Dec. 22nd. ATG is Mayor of Dodd City. WXY is NCS for the new YL Net on Thurs. at 1:00 P.M. on 3885 kc. BDB and OM are back in Dallas for keeps. KRZ has been working Guam, Japan, and the Philippines on 15 and 20 meters. MIQW is NCS and UXY ANCS for No. Tex. Emerg. Net., which meets on 3930 kc. 8 A.M. Sun. AAO will have his kilowatt on the air soon. CDN has moved from Lubbock to San Angelo. The Abilene Amateur Radio Club assisted in a Crippled Children's Fund Drive in cooperation with the Kiwanis Club and TV station. Mobile units picked up the funds. CIP, BJL, and EOY are active with mobile units, reports TGW. CZW is looking for contacts on 144 Mc. DTA is operating portable in the Fort Worth Area. WN5FBY is working c.w. mobile on 40 meters. TJP has a new Viking II. The Texas YL Net meets each Thurs. morning on 3880 kc. at 9:30. The Dallas Amateur Radio Club's new officers are SDG, pres.; UHF, vice-pres.; and TMZ, secy.-treas. KZC and VMR, formerly of Roswell and Wichita Falls, are now being heard in Lubbock. YPI is rebuilding to a 500-watt rig and is running 5 watts on 75-meter 'phone. ZTB set up a portable rig at a Scout camp over the holidays, assisted by EFJ, FIE, and FIP. TVA is out of the hospital. UUR received an ARC-9 transmitter/receiver from MARS for

(Continued on page 116)

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Christmas. Blue Ridge (160 meter) Net is up with 92 per cent attendance. Traffic: K5FFB 1094, W5BKH 514, UBW 447, YP1 350, AHC 338, ACK 179, PAK 159, DTA/5 131, CF 72, ASA 53, RRM 38, OCV 33, YKE 29, TFP 12, LGY 3.

**OKLAHOMA** — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Canady, 5G1Q, SEC: KY, RM: GVS, PAMs: PML, SVR, and ROZ. Message traffic has been much increased by the holidays as shown by this month’s traffic report. Sincere regret is felt at the passing of Old-Timer EZK at Enid who did much to promote amateur radio. The position of call letters in the alphabet is no longer any indication of the age of the license since the necessity of reissuance. The ACARC has issued a manual of procedure for c.w. operators which is available on request and is well worth while. CXM had a nice write-up and picture in the *Enid Morning News* as the State’s only YL EC. About half of the 77 counties in the State now have ECs but KY is asking for eligible applicants for the others. The Enid Annual Dinner and Hamfest had 103 registrations, 74 of them licensed. Among those present were the SCM, SEC, RM, two PAMs, and the local c.d. director. GIQ was MC. The North Fork Amateur Radio Club has set the date for its annual affair as May 21-22. Many thanks to those sending in traffic reports and news items. News must be of general interest to be included in this column. Traffic: (Dec.) W5GVS 451, MRK 216, MQ1 107, SVR 97, ZKK 90, PML 77, TK1 74, TC/JXM 68, ADC 65, QAC 62, KY 58, RST 43, MFX 42, REC 32, WTC 32, ITF 30, SWJ 30, WSM 27, CYQ 23, TNW 21, FEC 19, PNG 17, EHC 12, CBY 9, UTC 4, WTA 2.

**SOUTHERN TEXAS** — SCM, Dr. Charles Fermaglich, W5JFF — The Galveston County ARC participated in a recent c.d. alert. Everything in communications went off as expected. The club house was the center of communications activities. The following participated: VUS, KXA, DJD, AUN, DJC, PBY, and BPH. The GCARC is going ahead with plans to give amateur radio good publicity. DeVaney, Boles, and White gave a talk and demonstration to the Kiwanis Club. DJC now has a General Class license. DJD has a 4-watt mobile. Larry Gateley already has worked 14 states and hopes to get WAS before he gets his General Class license. FJF has been doing very nicely with a new kw. John Henry Kerby, III, has passed the Novice Class exam and soon will be on the air, portable in Arizona. WN5BTP is grinding crystals like mad, he now is Technician Class. URU has a new 813 rig on the air. CE is rebuilding and has a 75A-3. LSE is doing all the work around his house lately. The reason will be announced as soon as we know if it is male or female. Buddy Jarvis is soon to plunge into the sea of matrimony. Good luck. FEK is working hard on *HARC News* and 2 meters. SDA has a new ham shack. The HARC is progressing with its plans for a club house. Traffic: W5MIN 2326.

**NEW MEXICO** — SCM, G. Merton Sayre, W5ZU — SEC: KCW, PAM: BIW, V.H.F. PAM: FPB, RM: JZT. The NMIEPN meets on 3838 kc. Tue. and Thurs. at 1800, Sun. at 0730; the NM Breakfast Club every morning except Sun. 0700-0900 on 3838 kc.; NM C.W. Net daily on 3633 kc. at 1900. In operation “Ready” Dec. 6th, the following stations were active: ADX, AHQ, AK, AWR, BIW, BLO, BTB, BXP, CEE, CMI, DAD, DRA, DZB, EDN, FAG, FIE, FVY, GEM, GXU, GYN, HJF, LEE, KCW, KWR, NSN, NUN, OAF, PGJ, PIZ, THA, UCN, UDM, UWA, VDY, VNZ, WBG, WBJ, WPA, YFN, YIK, YPC, YWG, YWU, ZCV, ZET, ZU, and ZUV. CEE did a nice job in getting word to Canal Zone and Honduras on 21 Mc. to notify a person of his mother’s passing. CIN had a lot of mobile QSOs en route to and from Michigan. FJE and NSJ are active on 430 Mc. WNL, ECS, EEM, and UEO, in Albuquerque, recently got on 144 Mc. FPB reports that over 40 hams in Albuquerque have 144-Mc. gear. ZU got a Communicator 1 for Christmas while in San Diego. AKR worked all states but Delaware in ‘54 with 8 watts on 7042 kc. SUP reports that the Hobbs Radio Amateur Club has discussed call license plates. RES puts in a nice signal. BAQ is back with 813s. CEE and LIH visited the radio club at Portales. BHF has been on 40 meters and has a new SX-88. Ex-WN5DUB has a Viking II. Traffic: W5QR 73, AQQ 64, JZT 53, CMI 34, HJF 25, ARD 17, AK 16, WBC 16, CEE 14, ZU 10, AWR 6, BZA 2, BZB 2, BXP 1.

### CANADIAN DIVISION

**MARITIME** — SCM, Douglas C. Johnson, VE1OM — Asst. SCM: Fritz A. Webb, 1DB, SEC: RR, RMs: VE1HJ, VO6X, PAMs: VE1OC, VO2AW, VO6N, ECs: VE1AAY, VE1DQ, VO2G, VO6U. New appointee: VO1D as EC for St. John’s Area. Congrats to OO VE1BN on his showing in the November F.M.T. Les had an average error of 12.8 parts per million for four measurements! AV is doing well with new Class B modulator on 75 meters. Ex-VE1MZ now is W9IVP. ID has a new B.&W. transmitter. DQ, EC for Nova Scotia, reports the need for OPS volunteers at the provincial c.d. station. VO1Y put through his annual DX call to Santa on Christmas Eve to the delight of many VO

(Continued on page 118)

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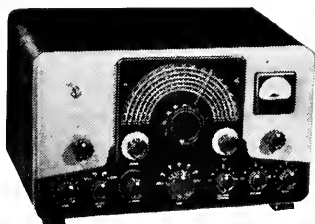
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and W/VO jr. operators. VO1AE now is mobile. VO2B and VO1T are after TV DX. W9DPH is now on from VO4. W8SBS/VO2 is active from Torbay. Congrats to VO2I on the new jr. operator. W4KYM/VO6 is knocking off Ws and Gs on 160 meters. VO2G made WAC in four months on 40 meters. New executives of GBARC are VO6QG, pres.; VO6X, vice-pres.; VO6N, secy.-treas.; VO6AB, public relations. VO6U has worked 101 countries to date. VO6P is a new call at Goose. VO6O is on from Cape Harrison. VO6X recently made a trip to Montreal. Traffic: VO6AH 354, VE1FQ 333, W7SNR/VO6 275, VO6B 235, VO6N 162, VO6S 145, W4WOU/VO1 144, VE1DW 118, VO6U 117, VO6AF 76, VO1T 46, VE1OM 38, VE1AV 36, K6EJ1/VO2 33, VE1ME 23, VO1D 17, VE1DQ 10, VE1OC 6, VE1DB 2.

ONTARIO — SCM, G. Eric Farquhar, VE3IA — BXX and AGB sport new rigs and report excellent results. ANY moved to Detroit. Good luck to you, OM. AOE endeavors to get the bugs out of the 2-meter rig. AUU is convinced that there is a Santa Clause. He received a communications receiver via that route. Welcome to Kapuskasing's latest ham, VW1. AVS completed his Clapp oscillator. NN enjoyed a Florida sojourn. The Quinte Club loses its valued ex-president, Doc Bruels, recently appointed to Scarboro's Medical Center. Congratulations and good luck, OM. BSW is working on a 'scope kit. BQP has added photography to his list of hobbies and admires the results of his recent Mexican trip. To the household of VZ we extend congratulations upon the arrival of a jr. operator. It's a boy and cigars were enjoyed during the HARC meeting. Band conditions still are grim and traffic-handlers experienced difficulty moving the large volume of Christmas messages. Traffic: VE3BUR 249, AJR 180, TM 148, NO 124, DQX 56, VZ 55, AVS 47, ATR 46, EAM 34, AUU 31, PH 28, CP 23, IA 17, AOE 14.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — All the VE2 gang join the rest of the Canadian amateurs in extending to VE2BE congratulations on his 25th anniversary as Canadian Division Director and wish him well for the coming years. AJE is ex-VE7ACG and has converted ARB receiver with Globe Scout 40 transmitter. AEM, KJ, APP, AOB, and EC continue the c.w. net at 0830 and 1300 daily on 3645 kc. ADU, VA, and AGI are located at Seminary of Trois Rivières. ANK is engrossed in mastering his 813. TI now operates a Viking Ranger. ATA, AOL, AUA, UB, and UZ are reported newcomers. QJ has had his call changed to AT, which was held by his father for many years. FL reports organization of the AREC in his district is proceeding apace, with the Northland Net operating on 3755 kc. at 1915 EST Wed. AGF spent three weeks in VE8-Land. DR has a new Viking Ranger. AQT is active on 75-meter n.f.m. with 400 watts. BK has ordered a 20A s.s.b. exciter. CA reports December was a busy month with traffic, also Europeans and Africans were coming in. Radio Club de Quebec (city) has ALV as president and AFC as secretary. The Club station, VE2CQ, will transmit ARRL Official Bulletins on 3740-kc. 'phone twice daily at 12:30 and 6:00 p.m. in both French and English. Traffic: (Dec.) VE2DR 143, EC 50, CP 31, FL 21, GL 17, CA 11, LO 7, BK 2, LM 2. (Nov.) VE2CA 98, EC 18, FL 7.

ALBERTA — SCM, Sydney T. Jones, VE6MJ — It is with sincere regret that we have to report the accidental death of EL, of Camrose. Don was a good operator, a brilliant technician, and will be sadly missed by all who knew him. Our deepest sympathy is extended to his wife and family, and particularly to his dad, LL. WC reports reduced activity because of other commitments. LQ has an 813 rig in the blueprint stage. HL has an 813 rig on 7-Mc. c.w. and is getting FB reports. Any amateur station in Northern Alberta is invited to check into the new C.D. Net which meets on 3765 kc. at 0900 hours Sun. NX has a new rig going and is working out well on 14 Mc. CE is checking into the B.C. Net nightly. ZR is chasing the DX. FF, IZ, MO, ON, KP, PS, and EG are active on the new C.D. Net. HM, ZR, and MJ did reasonably well in the last Frequency Measuring Test. GW is active on 14-Mc. 'phone and sports a new beam. AL has a new jr. operator and is an active ORS. XG is QRL temporarily with TVI troubles. Traffic: VE6HM 144, OD 32, MJ 10, WC 9, AL 6.

BRITISH COLUMBIA — SCM, Peter McIntyre, VE7JT — Last month there was no column because of the press of business and the season activities. Thanks to the two who took the time to write after reading the last published column, namely 6MJ and 7AKD, who both touched on the lack of old-time ham spirit. US was the guest speaker at the VARC meeting where he gave an excellent talk on s.s.b. which was well received. Wilf reports that VE7s ABU, AKA, AKN, ALW, BV, TV, and YY are either on or getting on with s.s.b. and that there are 10 phase shift networks and 5 slicers floating around the Province ready for operation. The AREC has been having a rough time with band conditions very poor, QRM from VE4s, 5s, 6s and other sorts of sundry unmodulated carriers. There are some ECs throughout the Province who forget that reports to DII are necessary, so start reporting, fellows, or at least tell DII you are no longer interested. The AREC Net covers a large amount

(Continued on page 120)

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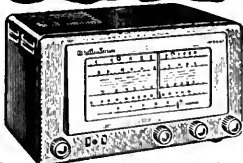
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of territory now, with check-ins from the Yukon, N.W.T., and Alberta on a regular roll call. Hope you all enjoyed the festive season and are on the road to a good 1955. Yours truly wants to know when the next hidden transmitter hunt will be. Not where, but when. Traffic: (Dec.) VE7QC 48, XY 35, DH 20. (Nov.) VE7QC 55, DH 32, KL 27, ZV 19.

**SASKATCHEWAN** — SCM, Harold R. Horn, VE5HR — DR attended the "Communications Planning Course" held at Arnprior, Ontario, Civil Defense College, and reports that much information was gained and many ideas were exchanged on ways to put communications to good use during an emergency. A good number of amateurs attended. CX reports that EB was married on Dec. 7th, with JG, BO, RU, EB, and their XYs in attendance. RU worked 45 countries the past summer with his 80 watts and a two-element vertical on his trailer. Ex-5JS now is 7IW at Kelowna. PW works 21 Mc. and likes that band. BG has a new Viking Ranger. RG is back on 75 meters after being QRT for a long time. MX is heard on 14 and 3.5 Mc. with his Viking. LM is now located at Saskatoon and BC at Swift Current. AT was the only VE west of Ontario to report during the B.E.R.U. Contest. BZ is a new OBS and can be heard on 3740 kc. at 1800 hours MST Tue., Thurs., and Sat. Because of poor band conditions the 'phone net has been practically extinct but it is hoped that members will be on the watch for any traffic when the band is open. Traffic: VE5GX 4.

### Frequency Marker

(Continued from page 15)

controlling oscillator by factors of more than 10. Suitable low-frequency crystals, including those operating at 450 kc., and which should be as useful as those already mentioned, are available as surplus material for \$2.00 or less each.

A crystal-controlled frequency marker such as is described here can be built for from \$15 to \$20 if all parts, including the crystal, must be purchased new. Of course, if the receiver is provided with suitable power-supply terminals, filament and plate power could be taken from the receiver, in which case the cost can be still further reduced by omitting the filament transformer and rectifier-filter system.

The high precision and small size of this self-contained unit make it an especially useful piece of equipment for the radio amateur.

### Overtone Crystals

(Continued from page 17)

more capacitor than the circuit of Fig. 2A, and it will usually work well with crystals of either the overtone or fundamental variety interchangeably. We've used it repeatedly for 3rd-overtone work with crystals in the 6- to 9-Mc. range, and have had no trouble getting 5th-overtone oscillation with 3.5-Mc. crystals.

In some applications it may be desirable to have the crystal oscillator as high in frequency as possible. This is particularly true of crystal-controlled converters, where energy at frequencies other than the desired one may cause birdies and spurious responses. For converter use the circuit of Fig. 2C may have merit. This was suggested to the writer by Clare Reynolds, W9MBI, of the James Knights Crystal Co., Sandwich, Ill. He uses it in v.h.f. converters, and has also had direct control of an oscillator at 144 Mc. in a low-powered 2-meter transmitter. He

(Continued on page 122)

*"Don't get excited, Fred! I probably wired the transmitter wrong. It's the garage door that's supposed to go up."*



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reports that frequencies as high as 216 Mc. have been obtained with direct control, involving overtones as high as the 11th, with this circuit.

The critical element here is the value of the two resistors on either side of the crystal. Increasing them causes more feed-back, encouraging the tendency to self-oscillation and "squegging." Dropping their value much below that specified cuts out oscillation altogether. We checked many types of fundamental crystals in this circuit in the Headquarters lab, with the usual result: In going through dozens of crystals in the range between 6 and 9 Mc., we found only two that could be made to oscillate on overtones higher than the 5th, and very few would even go this high, though all worked well on the 3rd. However, when we checked about 20 overtone crystals, higher overtones were found with ease. With any 3rd-mode crystal, the 5th and 7th modes were found in every case, and in most instances the 9th was usable. Third-overtone crystals around 12 to 15 Mc. (fundamental 4 to 5 Mc.) could be operated on their 9th, 11th and even higher overtones in some instances. Several v.h.f. crystals from the International Crystal Co., Oklahoma City, for frequencies between 40 and 50 Mc. were made to oscillate as high as 150 Mc. These were 3rd-overtone crystals in CR7-type holders.

### Precautions with Overtone Crystals

Too many hams regard the frequency marked on a crystal holder as a fixed value, to be relied upon regardless of how the crystal is used. It should be borne in mind that even when the crystal is used at the fundamental frequency, the value marked on the holder applies only to the conditions under which the crystal was checked by the manufacturer. Changing the load capacitance into which the crystal works, using it in different circuits, or running it hotter than the manufacturer specifies, can make the frequency something quite different. Exact calibration may not be important unless you are planning to work close to band edges, but staying within the recommended operating conditions as to crystal current is important, if you want stability.

Most overtone crystals, being of the plated variety, are incapable of dissipating much heat. This means that the crystal oscillator must be operated at low power level, and with no more feed-back than is necessary to maintain good starting characteristics under load. The crystal oscillator should never be thought of as a power-generating device, and this is particularly true of overtone oscillators. The oscillator should generate a stable signal; stepping up the power should be left to succeeding stages.

When fundamental crystals are used on overtones, the frequency of oscillation may not be an exact multiple of the marked frequency. And the frequency will be different for series or parallel resonance. Moral: When working anywhere near band edges, have some accurate means of checking frequency; a crystal marking is no guarantee that you will be inside the band.

(Continued on page 124)



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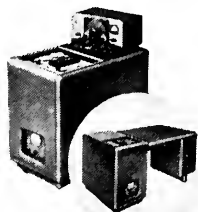
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# Test your QRK \*

Here's a little quiz based on articles appearing in *QST* for January. How much do you remember from the issue of two months ago?

1. What antenna popular during the 10-meter opening in the '40s has been revived as a 20-meter beam?
2. An average car antenna is just the right length for which amateur band?
3. Use of the grounded grid amplifier eliminates what troublesome problem?
4. The League recently filed comment on FCC Docket 11157. What does this docket propose?
5. What contests were held by ARRL during January?

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## Answers

1. *The Cubical Quad* (A Cubical Quad for 20 Meters, page 21) 2. *Six Meters* (A Simple Rig for Six-Meter Mobile, page 28) 3. *The need for neutralization* (Grounded-Grid and the 304-TT, page 33) 4. *Expansion of Technician privileges to six and two meters* (Happenings of the Month, page 48) 5. *The Novice Round-up and the VHF Sweepstakes* (pages 59 and 53, respectively)

\* QRK—*QST* Reading Knowledge. It is also the International Q-Signal meaning "Your readability is . . .". You'll find *QST* always QRK 5—Perfectly Readable.

The common test for self-oscillation, pulling out the crystal to see if oscillation stops, is not applicable to most overtone circuits. The capacitance of the crystal and its holder is a part of the feed-back circuit. If there is self-oscillation present, it will almost invariably stop when the crystal is removed.

In trying for high-order overtones, it may be necessary to bring feed-back up to the point where self-oscillation develops when the tuned circuits are resonated at frequencies away from the desired overtone. If a receiver covering the range is available, the self-oscillation frequency may be checked as the circuits are varied. When the desired overtone is approached there will usually be a sudden jump in frequency to that overtone, whereupon the signal (with b.f.o. on) will become stable and musical in tone, instead of raspy and subject to frequency shift during even slight mechanical vibration. Adjustment of such circuits is critical, and it usually will not be right for more than one crystal.

The tuning of circuits associated with overtone crystals affects the frequency of oscillation appreciably. There may be shifts of 50 kc. or more in the 144-Mc. band when tuning overtone circuits. Thus it can be seen that they are unsuited to shaving the band edges.

### To Use or Not To Use?

From what we have said here it can be seen that the ability to work with direct crystal control in the v.h.f. range is not an unalloyed blessing. There are applications, however, where overtone techniques have much to recommend them. They are almost a must in crystal-controlled converters, for instance. Here you want freedom from birdies in the form of crystal harmonics, and you also want the energy you inject into the mixer to be as free as possible from frequencies other than the desired one. If you can get direct control at the injection frequency in your crystal-controlled converter, by all means do it. The power output required is, of course, very low, so you can achieve high stability in your converter readily. And you're not going to change injection frequencies, so critical adjustment is not an important deterrent. You're going to have to do the job only once.

Third-overtone operation of cheap and plentiful surplus crystals in the 8-Mc. range is often a convenient and economical way of controlling the frequency of v.h.f. transmitters. If circuit simplicity and low power drain are important considerations, along with low cost, overtone circuits are certainly attractive.

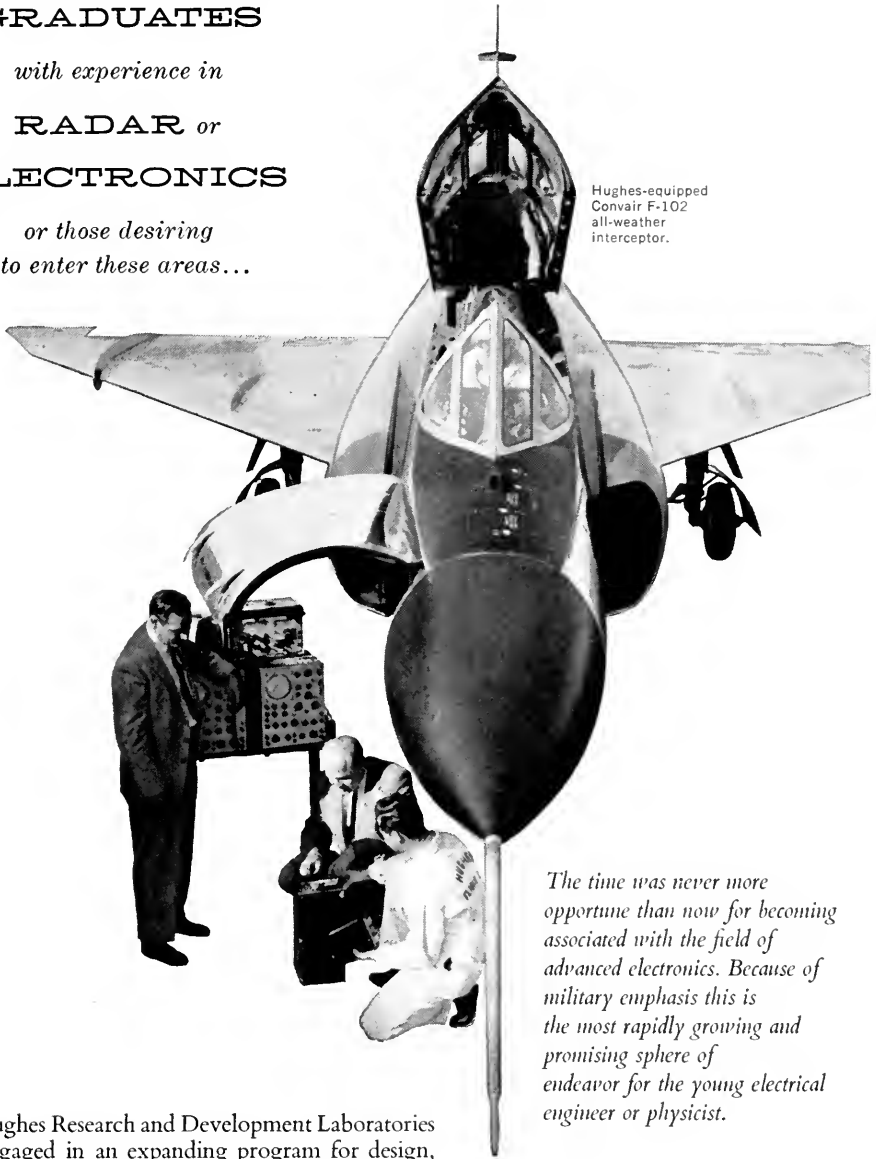
But suppose you're going to build an exciter that you hope to use on several bands. You want the oscillator to work with 3.5-, 6-, 7-, 8-, 12- or 14-Mc. crystals, so as to make use of a stock you have on hand. Quite likely, you'll want to have a VFO to work into the crystal-oscillator stage, too. Simplicity and low first cost are minor considerations in such a design, compared to the convenience of being able to use any type of crystal. Stability and more reliable frequency calibration

(Continued on page 126)

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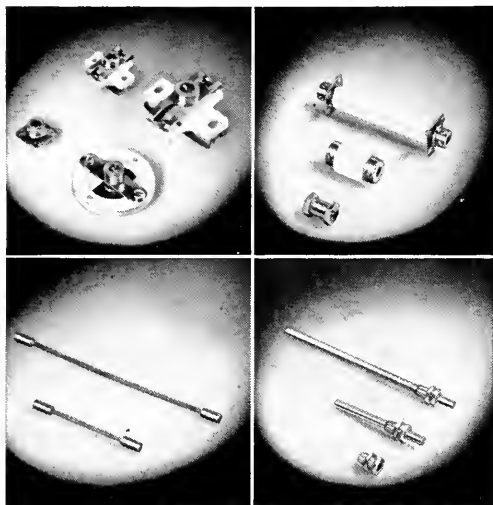
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are important here, too. Overtone circuits are out for such applications, obviously. You'll build this rig with all the customary TVI-prevention measures, anyway, so the possibility that unwanted multiples of the oscillator frequencies may appear in the output is of little importance. A careful consideration of all the design factors will enable you to make a wise choice as to whether overtone-oscillator techniques are attractive for the job you have in view.

## Antenna Coupler

(Continued from page 19)

harmonic attenuation. Note the similarity of Fig. 3B to a low-pass filter section. It should be possible to match either 52- or 72-ohm coax without difficulty.

The nominal rating of the components used is 500 watts. The major operating precaution is not to operate the circuit switch  $S_1$  with the power applied. These switches can carry quite a bit more current than they can break. The same precaution applies with somewhat lesser weight to  $S_2$  and  $L_1$ .

The L-C matching section may be used by itself for matching grounded antennas by bringing the antenna line in and tapping into the coupler at the point marked "X" in Fig. 1. No coil should be plugged in the jackbar, and switch  $S_1$  must be in position 2 or 3. The only precaution is to observe the voltage ratings of the capacitors in the matching section.

If the same type of ceramic stand-offs are used as those in the photographs, be extremely careful when mounting them to the metal panel, as they break very easily. Fiber washers under the nuts and between the ceramic and the panel should help considerably.

## HAMFEST CALENDAR

**PUERTO RICO**—The 1955 PRARC Hamfest will be conducted on Sunday, March 20th, on the Island of Puerto Rico, the exact location to be announced in the Club's bulletin, *Ground Wave*. There will be talks and demonstrations of TV, TVI and ITV. No changes in admissions from those of last year. U. S. and foreign amateurs desiring hotel accommodations should contact KP4DU for arrangements.

**WASHINGTON**—The Bremerton Amateur Radio Association will hold a hamfest on March 5th at the Elks Temple, 5th & Pacific, Bremerton. Registration will be at 1:00 P.M. The banquet starts at 7:00 P.M. A chicken dinner, country style, will be served. The price is \$4.00 per person. There will be a dance later in the evening. Fun for all. Tickets may be ordered in advance from Allen R. Nelson, W7GUS, Box 103, Port Orchard, Wash.

**OHIO**—Saturday, April 2nd, at the Dayton Biltmore, Dayton—the Dayton Amateur Radio Association will hold its annual Hamvention. Hamvention is the best treat in ham radio—ask anyone who has attended. The day-long program will feature outstanding speakers on all phases of amateur radio and a special program has been prepared for the ladies. The affair will wind up with a banquet at 7 P.M. in the hotel ballroom. Tickets are \$5.00 in advance or \$5.50 at the door. Reservations, more information and an attractive brochure may be obtained from D.A.R.A., P.O. Box 44, Dayton 1, Ohio.

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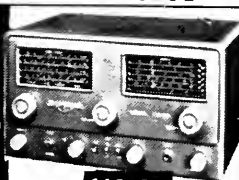
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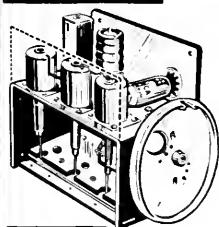
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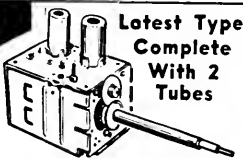
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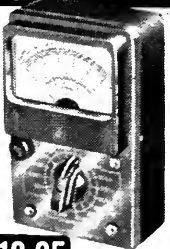
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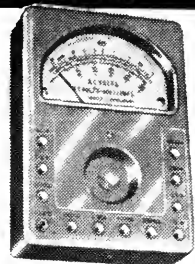
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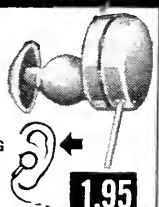
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## Receiver Design

(Continued from page 21)

worked; however, instability, tracking difficulties, and oscillator pulling were quite bad above 7 Mc. This condition was attributed to insufficient frequency separation and the consequent reactance of the local oscillator circuit coupled into the cathode of the mixer, producing sufficient phase shift to cause oscillation in the mixer and pulling of the local oscillator frequency. Again, the 6C4 cathode follower provided a practical solution, by giving necessary isolation, resulting in a cool, smooth-running low-noise mixer. No further difficulty with tracking was encountered.

### Circuitry

Fig. 1 shows our low-noise front-end circuit. No a.v.c. should be used on the first r.f. stage. It should be emphasized that in order to utilize the grounded-grid triode mixer it is imperative to use a separate h.f. oscillator. Although a converter circuit may appear complicated, a little study will reveal that it consists of simple triode-oscillator, signal-input and i.f. output circuits. Fig. 2 illustrates modification of two common types of single-tube converters to separate oscillator mixers for use in this low-noise front end. There is nothing tricky about making this modification. One precaution: connect all grounds to the cathode return of the stage being wired. The use of tube shields for all the 6C4s is recommended, especially if they are mounted below deck, as was the case in our receiver. Although major realignment will not be necessary, a touch-up of the trimmer capacitors at the high end of each band may be required. Readjust the oscillator trimmers first to bring the receiver back into calibration; then the r.f. and mixer trimmers for maximum gain.

### Conclusion

Here is a circuit that for the first time makes practical the use of low-noise techniques in general-coverage receivers. It is easily applied to any receiver without introducing additional knobs or alterations to existing tuned circuits and, furthermore, works at the first try. The few extra wires and components are well worth the time and expense. Comparative listening tests were made on 14 Mc., between a receiver incorporating this circuit and three late-model stock commercial receivers in the \$400.00 class. Listening fatigue attributable to internal noise was considerably less, and twice as many DX stations were heard.

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## Multimatch Antenna System

(Continued from page 23)

again, the capacitor is made up of concentric aluminum or dural tubing separated with polystyrene, and the coil is concentric. In each capacitor, the polystyrene insert (Fig. 4) should provide a tight fit to both sections of tubing, and the insert should be driven into the outer conductor to the shoulder. The inner conductor should be driven into the insert for a distance of  $2\frac{3}{4}$  inches (thus protruding 2 inches inside the outer conductor). This gives a capacitance of approximately 25  $\mu$ f. The trap inductors are wound with No. 8 wire. The 10-meter inductors have 5 turns  $2\frac{1}{2}$  inches in diameter, with the turns spaced approximately  $\frac{1}{2}$  inch. The 21-Mc. inductors are similar, but have 7 turns. As with the wire-antenna traps, the inductors should be adjusted for resonance near the center of each band before they are installed. The ends of the inductors are wound around the element sections and fastened with clamps. The array is fed with a T match to 75-ohm Twin Lead.

Fig. 3 shows the element dimensions used by the author. Antennas of this type, in both wire and beam forms, have been installed by many amateurs, using traps constructed by the author. Without exception, all have been enthusiastic about the performance.

## "Hidden Gem"

(Continued from page 24)

A Vari-Loopstick is used for  $L_1$ , as suggested by W8E1Y. It is a commercial slug-tuned inductance which is widely used as a broadcast-receiver antenna. It sells for less than a dollar, and requires only a small hole for mounting. It comprises a very compact, adjustable tuned circuit consisting of its self-inductance and the distributed and stray capacitance of the circuit. It peaks very nicely on 75 meters using a transmitter or grid-dip meter as a signal source. Once the Vari-Loopstick is peaked at 75 meters, no further adjustment is ever necessary, since it is broad enough to cover the entire 75-meter band, and the increased radiation efficiencies on the higher-frequency bands more than compensate for the lack of a tuned circuit.

When it comes to the pick-up antenna, you can really let your imagination go to work. Only a short vertical probe from 4 to 8 inches in length is necessary if mounted on the rear gravel skirt or on the rear-window deck. An unused broadcast-receiver whip is efficient and inconspicuous. The antenna used here is a right front-fender guide which is insulated from the car body. This serves double duty because it works well as a pick-up antenna and helps the XYL in parking. Any insulated wire serves as a lead-in to the meter.

(Continued on page 132)

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Exclusive at Radio Shack! Sorry we can't tell you the famous make of this capacitor, rated at 50 mf at 3 KV (dc), but it's brand new — NOT gov't or other surplus — and fully guaranteed. Provides excellent dynamic regulation and optimum power output when filtering power supply for voice frequency, especially in low frequency syllabic loading, in suppressed carrier single side-band transmitter operation. Mild steel construction, finished gray. Size: 13 1/2" wide, 5 1/4" deep, 14 1/2" high. Insulator bushing and stud terminal 4" high. Mounting center 15 3/8" for 3/8" bolts. Allow for 75 lb. ship. wt. NOTE: the quantity is very limited — first come, first served.

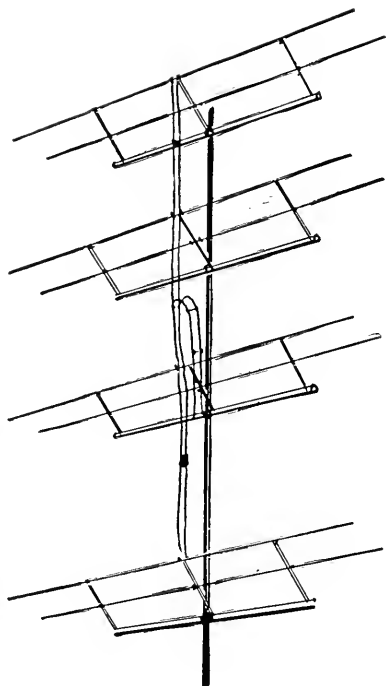
REFERENCE: See G-E "Ham News" of Jan.-Feb. and March-April 1954 for data on better dynamic regulation and power supply design. The value of this capacitor will then be even more fully appreciated.

**RADIO SHACK CORPORATION**



167 Washington Street, Boston 8, Massachusetts

230-234 Crown Street, New Haven 10, Connecticut



## COLLINEAR ANTENNAS for the TWO METER band

8 element beam .....	\$12.50*
16 element beam .....	\$21.50
32 element beam .....	\$37.50

**COLLINEAR** antennas for the two-meter CD and CAP frequencies are also available.

If your local Distributor does not have our literature, write direct to the factory. All inquiries answered promptly.

### U. H. F. RESONATOR CO.

224 7th Street

Racine, Wisconsin

\*All prices F.O.B. Racine, Wisc.

## Using the F. S. Indicator

Once your field-strength indicator is installed, it may reveal some surprising facts about your transmitting system. For instance, you may find that maximum output does not occur at the plate-current dip but somewhere off to one side. You may find that output does not continue to increase with increased coupling, even if the plate current does go up and you still are able to get a plate dip. A point is sometimes reached where increased coupling merely heats your final amplifier and the transmission line, and actually decreases power output. If your grid drive is adjustable, you may find that there is an optimum setting for it, too. Too much drive may drop the output just as too little will. You will be able to find the exact frequency at which your antenna system radiates best and you will be able to prune your antenna to any desired frequency. The system followed here to QSY the antenna on 75 meters is to use capacity sprigs clipped on the antenna above the loading coil. The sprigs are short lengths of stiff copper wire and attached to small battery clips. If the antenna itself is tuned to the high end of the band, four sprigs of different lengths will enable you to cover most of the band with reasonable efficiency and will spot five frequencies for maximum output. If you are using one of the new continuously-variable loading coils, your field-strength indicator will help you to determine the correct tuning in a hurry.

And not the least value of this gadget is its ability to let you know that you're actually radiating. You won't have to tear the transmitter apart or run a special check when you fail to raise a station, if your meter is indicating normal output. You can just conclude that the other guy is deaf or has left the antenna off his receiver.

The sensitivity control should be turned all the way down when the indicator is not in use to protect the movement from overload if you should get too close to a strong commercial station. This also damps the meter against mechanical vibration.

The indicator can be constructed in a couple of hours, and attached to your car in even less time. About the only cost of any consequence is the meter movement, but almost everyone should have some meter available which can be used. Remember, the larger the pick-up antenna and the closer it is placed to the radiating antenna, the less sensitive the meter movement required. With fifty watts input, a 150- $\mu$ a. movement is more than ample when using the fender-guide pick-up.

No matter whether you're running a mobile kilowatt or only a half pint, whether you have a super high-Q antenna or just a piece of wire, a mobile field-strength indicator will at least result in the self-satisfaction of knowing when you are getting the maximum available output from your system. It will also let you know if changes in your system are of any benefit, and should result in more and better QSOs. You probably will discover other uses and applications yourself.

## LEARN CODE!

SPEED UP Your  
RECEIVING  
with G.C.

### Automatic Sender

Type S  
\$28.00 Postpaid in  
U. S. A.



Housed in Aluminum Case Block Instrument Finished. Small—Compact—Quiet induction type motor, 110 Volts—60 Cycle A.C.

Adjustable speed control, maintains constant speed at any Setting. Complete with ten rolls of double perforated tape. A wide variety of other practice tapes available at 50c per roll.

**GARDINER & COMPANY**

STRATFORD

NEW JERSEY

# Let's call a ♠ a ♠ !



**hallicrafters**

**ELMAC**  
"THE NAME HEARD AROUND THE WORLD"

**HAMMARLUND**

No need to  
the family  
The Harrison Easy Pay  
Plan has terms to suite  
your budget! Ask for con-  
fidential acquaintance  
blank.

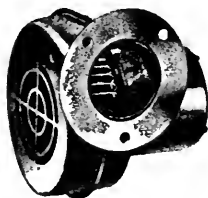
**HARRISON HAS**

## BLOWERS

for every Electronic Application

These dependable blowers pay for themselves immediately by up-rating tube and component capabilities to their higher forced ventilation limits. Lowered operating temperatures also reduce equipment failures, extending useful service life.

Standard production part with leading makers of transmitters, induction heaters, calculators, radar, etc., particularly to enable compacting more performance into smaller space.



### Model RO-50

Most popular WHISPER-QUIET small blower. Delivers 50 CFM (44 CFM at .25 inch static pressure). 115 Volt 60 cycle 2600 RPM shaded pole (brushless) motor creates no electrical interference. Draws only 40 watts. Over-size, self-aligning bearings for cool, trouble-free performance. 5 3/4" high, 5 1/4" wide, projects 6-5/16" from mounting flange. 2 1/8" dia. discharge. Shipping weight 5 lbs. Immediate shipment from stock.

1-9	10-24	25-99
\$8.95	\$8.45	\$7.75

Ask for literature on our other single and dual models 15 to 275 CFM.

Exaggerated allowances for old gear are pure and simple discounting and price-cutting.

As a large scale Factory Authorized Distributor for every leading Equipment manufacturer, I pay them rock-bottom prices for all latest models, and can therefore give you the very best deal. For 30 years now — since 1925 — I have always been happy to match or beat any competition, so . . .

**"I guarantee to top  
any trade-in deal —  
no matter how crazy!"**

No need to go to the delay, expense, and risk of shipping your equipment all over the country. Just get the best offer, and bring or send it to me along with your old gear. You'll be glad you did! You don't need a ♣ to get the kind of service that will make ♠ your ♥ sing for joy!

Let's have the mutual pleasure of doing business together. It will be to your advantage!

Sincere 73,

**Bill Harrison, W2AVA**

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for all the best makes! Latest improved production of all current models in stock for immediate shipment. Place your order with HARRISON now for earliest delivery of new items.

Literature? — Just ask for it!



**National**



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I do NOT sell on approval  
That's your assurance that  
everything you get from Harri-  
son is brand new, latest im-  
proved production. You are the  
first to use it! And it is guar-  
anteed to be 100% perfect in  
every respect!

## HARRISON IS HQ

FOR ALL MODELS  
OF THE FAMOUS

**NEW! 3 BANDS  
ON ONE BOOM!**

Telrex's answer for multi-band operation in limited beam space, using TV rotator!

Two full size 5.6 db gain elements on 10, two slightly condensed elements on 15 giving 4.9 db gain, and two Super Mini-Beam elements with broad banding end pieces on 20, giving 4.8 db power gain over a full size dipole — all on one 2" boom 22 feet long.

Each beam has the famous Perfect-Match Balun, to take 52 ohm coax cable.

Total weight 53 lbs., turning radius 16 ft. Harrison has it! For immediate delivery.

**Model TBM-3**

**\$190.**

Visit  
**LONG ISLAND'S**  
newest, largest  
center for Ham,  
Service, Hi Fi,  
and industrial  
Material.

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at 145th Street  
JAMAICA**

**REpublic 9-4102**

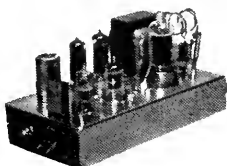
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PRE-TUNED  
BEAMS**

**Save up to \$100  
with Harrison's sen-  
sational Beam —  
Prop Pitch Rotator  
— Tower Bargain  
Package! See pre-  
vious ads, or ask.**

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**225 GREENWICH STREET  
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## TWO METER TRANSMITTER • CONVERTER

Area of the Base is  
58% of the size of  
this Page



LW-50—

Fixed or Mobile

- 15 Watt Transmitter
- Crystal controlled
- Speech for Crystal or Carbon Microphone
- Push-pull Modulators with Speech Clipping
- Pre-assembled Kit

LW-50K \$34.50

Wired and tested

LW-50 \$54.50

Crystals \$2.00

6 Tubes \$10.50

AC Power Supply

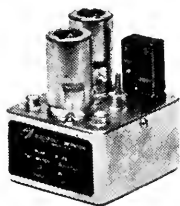
\$29.95

Area of Base is  
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- Crystal Controlled Converter
- 7-11, 14-18 Mc or BC output
- BC IF for Mobile or Nets
- Only 5 ma total B+ drain

Completely wired and tested with tubes, crystal and coax plugs.

LW-61  
\$18.50  
Postpaid



See QST May '54, pp. 47-48  
or write for literature.

**ELECTRONIC LABORATORY**  
ROUTE 2, JACKSON, MICHIGAN

## Transmitter Hunting

(Continued from page 27)

his call), the hidden transmitter, inviting all mobiles on 29 megacycles to participate in tonight's hidden-transmitter hunt. We are in the south sector (or north sector if he is in the north half of the city). We shall start the hunt with a roll call. All participating stations please identify themselves. This is W7QPR mobile, the bunny. By." During this transmission the participating stations take a bearing, determine the axis, and possibly the direction of the hidden transmitter, and start after him, announcing their calls for the roll call. After the initial transmission, the bunny may remain silent until he is called. When he is called, he transmits for fifteen or twenty seconds, allowing the pack to get a "fix" on him. The idea is to ask for as few transmissions as are necessary, because each time a participating station asks for a transmission, the whole group takes a bearing.

On a typical hunt, the first bearing was taken at point A, Fig. 3, and this indicated a northeast-

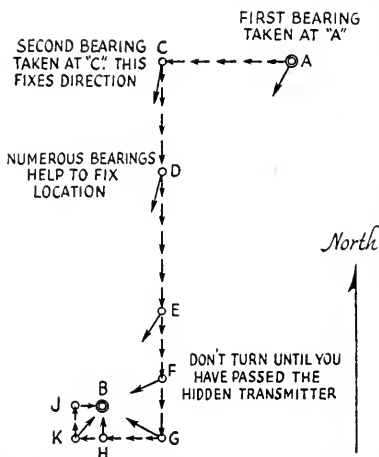


Fig. 3—Diagram of a typical transmitter hunt following the "spiral" system described in the text.

to-southwest axis (A to B). The author drove about a mile westward to point C and called for a transmission. The bearing then appeared in a more north-to-south direction, indicating that the bunny was definitely to the south and a little west. Driving south (the streets run due north and south), bearings were taken at D, E, and F, as other mobiles called for transmissions. By this time, the author's XYL, who was the copilot, and the two junior ops in the back seat were calling for a turn to the west. At G, a transmission was asked for and it indicated that the author was south of the bunny's east-to-west axis. So, turning west, bearings were taken at points H and K. Position K showed that the author was west of the north-to-south axis of the hidden transmitter. The author then drove northward very slowly. At J, a bearing was taken which

(Continued on page 136)

USED IN ALL 48 STATES!

Self Supporting  
**STEEL TOWERS**  
For Rotary Beams, FM, TV

Amateurs and commercial users alike — in every one of the 48 states and many foreign countries — have discovered why VESTO is the most famous name in tower! If you're not already a Vesto owner, write today for full information.

**ATTRACTIVE — NO GUY WIRES!**

- 4-Post Construction for Greater Strength!
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Width of  
Base Equal  
to 1/5 Height

**SMALL DOWN PMT.—EASY TERMS**

Vesto Towers are available in a wide range of sizes to meet requirements of amateurs and commercial users alike. Note the low prices for these quality lifetime towers: 22'—\$104, 28'—\$127, 33'—\$149, 39'—\$182, 44'—\$208, 50'—\$239, 61'—\$299, 100'—\$895.

Towers are shipped to your home knocked down, FOB Kansas City, Mo. 4th class freight. Prices subject to change... so order now! Send check or money order... or write for free information.

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# Attention

## OWNERS OF JOHNSON VIKING II TRANSMITTERS

NOW you too can have sparkling single sideband performance from this fine transmitter. Add the B&W 51SB Single Sideband Generator to your Viking II, and you'll enjoy all the operating characteristics you now get *plus* the superior effectiveness of SSB transmission. Here are just a few of the features of the B&W 51SB:

- Complete bandswitching from 80 to 10 meters • Operates with either crystal control or VFO of your Viking • Voice control operation on SSB • Speaker deactivating circuit

The 51SB comes to you ready for hook-up to your Viking. Complete instructions and necessary modification kit are of course included.

Construction of the 51SB is completely unitized. The equipment can easily be removed in three major sub-assemblies: R-F Unit, Audio Unit, and Main Chassis Unit. It's entirely self-contained except for microphone.

GET THE FACTS! Write B&W now for Bulletin 51SB, or see this new SSB generator at your distributors'.

**B&W**

**BARKER & WILLIAMSON, INC.**

237 Fairfield Avenue

Upper Darby, Pennsylvania



**PRICE: \$279.50**

Amateur Net

Factory wired and tested. Complete with tubes, instructions, modification kit.

### Watch for News

Information on application of 51SB to other communication transmitters will follow soon!

SEE US AT THE I. R. E. SHOW  
202 INSTRUMENTS AVE.

## ORIGINAL VAARO MOBILE PRODUCTS

## NOW MADE BY DAVIS ELECTRONICS

### ORIGINAL VARIABLE SINGLE UNIT COIL

For 75-40-20-15-11 and 10 METER BANDS.

NOW IN THE 1955 DESIGN WITH THE NEW, IMPROVED "DUAL CONTACT" between the coil windings to provide a greater, more positive, more efficient contact. Coil can be INSTANTLY TUNED to ANY DESIRED BAND or FREQUENCY by ingenious locking device. Factory pretuned. Continuous coverage from 3750 kcs. to 30,000 kcs. Highest "Q" available in an all-band coil. Fits all whips and bases.

MODEL V-102B—for 0 to 500 watts input

**\$14.95**

MODEL V-103B—for 0 to 1000 watts input

**\$16.95**



**VAARO BUMPER MOUNT** Eliminates cutting holes in your car. Fits any antenna and car bumper. BUMPER CURVATURE INSERT exactly fits your make and model of car. Socket dimensions: Standard 3/8" x 24 thread. Has .500 thick fibreglas disc of top dielectric material. MODEL V-105. Cast aluminum. Hammertone baked enamel, **\$13.95**

MODEL V-105V. Guaranteed 5 years against corrosion and flaking. Cast bronze. Heavy chrome and copper under-plating, **\$25.95**

### VAARO "WHIP FLEXOR"

keeps whip perpendicular at high speeds—thus no change in loading or impairment of reception. Cuts down bad "QSB" action on receiving end. Whip can be brought into horizontal plane for car storage, etc. Has strong cadmium-plated square steel wire spring. Only **\$3.95**



The DAVIS-VAARO Line also includes: FIBREGLAS WHIPS—6' \$8.50, 7' \$8.75, and 8' \$8.95. Also BASE SECTIONS (Solid Hex); 12" \$3.75. 24" \$3.95. 36" \$4.95.

**VAARO "WHIP CLAMP"** — Securely fastens to roof water-drain of any car without damage to finish. Fastens whip securely down to car roof level for storage, low wooded areas, etc. Solid brass, chrome plated. Installed in 30 seconds. **\$1.79**



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### VAARO ELECTRONICS DIVISION

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VAARO DIV., DAVIS ELECTRONICS Q-2  
BOX 1247, Burbank, California  
SIRS: RUSH INFORMATION TO ME AS CHECKED:  
☐ Send CATALOG INFORMATION and DATA on  
VAARO MOBILE ANTENNA EQUIPMENT.  
☐ Send Address of NEAREST AMATEUR JOBBER.

Name \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

# Tecraft

## CASCADE CRYSTAL CONTROLLED CONVERTER for 144 or 220 Mc.



### Provides:

- **HIGH SENSITIVITY** — Sensitivity better than 1/10 microvolt. Gain approx. 30 db. Noise approx. 4 db.
- **COMPLETELY STABLE** C.W. on 144 mc. NO mechanical modulation. Pure D.C. note. No drift.
- **RUGGEDLY BUILT** — Suitable for mobile application.
- **USE WITH ANY COMMUNICATIONS RECEIVER** — Availability with output at I.F. frequencies 6-10 mc., 8-12 mc., 10-14 mc., 12-16 mc., 14-18 mc. We recommend use at I.F. output 14-18 mc.
- **COMPLETELY SHIELDED** — In beautifully finished silver gray hammertone steel case.
- Available (SPECIAL ORDER) for other CD or industrial frequencies. Also available for Collins receiver.
- **USES 6BZ7, 2 — 6CB6, 2 — 6J6 tubes. COMPLETE** with plugs, tubes and crystal. **\$42.50**
- Kit Form. Complete. **\$29.75**

Ask your dealer or write us

**THE EQUIPMENT CRAFTERS, INC.**  
523 Winne Ave. River Edge P.O., N. J.

indicated the bunny was due east. Turning east, the bunny was located. He had been hiding between two buildings on a school ground.

The author calls this the "spiral" technique. It cuts down the possibility of passing the bunny without realizing it, a condition that might easily occur if the hunter tried to drive directly to the bunny.

Well, that's how it is done in Seattle, to say nothing of the coffee and rag-chew at the favorite beanery after the hunt. So, bundle the XYL and the junior ops in the family chariot and really have some fun.

## Mobile S.S.B. Receiver

(Continued from page 35)

The heaters are originally in series-parallel for 24-volt operation. They are easily rewired in parallel if the mounting screws holding the capacitors over each tube socket are removed and the capacitors carefully moved out of the way while making the necessary changes.

An additional stage of audio is necessary to obtain good speaker volume. A small sub-chassis was made from light-weight galvanized metal and soldered to two opposite capacitors, as shown in the photograph. A seven-pin miniature socket was mounted on this chassis to take the 6C4 audio tube.

The second detector was modified as shown in Fig. 2. The wiring for the a.v.c., a.n.l., and 6C4 audio stage is also shown here. The long leads going to the audio gain control should be shielded. Many of the components in Fig. 2 are already in the original set. Douglas R. Jordan's article, "New Life for the Q5-cr," *QST*, February, 1951, will be helpful to the builder.

After these modifications, the BC-453-A is a high-performance mobile receiver. I believe it to be the only unit, easily obtainable, qualified for s.s.b. mobile reception.

## Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1CCF, Carroll W. Still, jr., Atkinson, N. H.  
W1JLM, Anthony J. Liard, Clinton, Mass.  
W1UT, Lester E. Gavitt, Brookfield, Mass.  
W1VD, William F. Coleman, West Hartford, Conn.  
KN2IXL, George Penney, Pine Bush, N. Y.  
W2MZS, Cornelius V. Hulse, Montclair, N. J.  
W3QKS, John A. Eva, Tamaqua, Pa.  
W4LLL, ex-W3EX1, J. W. Scrivener, Orlando, Fla.  
KN6IMA, John F. Walker, Whittier, Calif.  
W6QZH, Herman R. Ascher, San Diego, Calif.  
ex-W8MZD, Paul Lawman, Clarksburg, W. Va.  
W8QX, James W. Quinn, Belleville, Mich.  
W0LDH, Reuben Sorenson, Keokuk, Ia.  
W0PYP, Harlan I. Trask, Rapid City, S. Dak.  
VE3OW, Romeo Vachon, Ottawa  
VE6EL, Eldon R. Langbell, Camrose  
HC2JR, John M. Reed, Guayaquil, Ecuador  
ZS1A, J. A. Twine, Capetown, S. Africa

## THE NEW Master-Flex-'R

### RELIEVES THE SHOCK OF THE WHIP ON LOADING COILS

Here is a must for all mobile hams!... The new heavy-duty Master-Flex-'R, designed to relieve the stress and strain and prevent damage that could be transmitted to the loading coil. The Master-Flex-'R protects the whip and prevents the loading coil from injury and detuning while driving at high speed, or from overhanging limbs and driving into garage. Permits whip to be fastened down to car on bumper mount installations of late model cars. Made of sturdy spring steel, yet flexible enough to absorb all the shock. Heavy cadmium finish to withstand the elements. Takes only a few minutes to attach to the coil.

Amateur Net

**\$1.95**

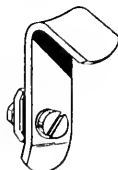
### NEW!... Master "TENAHOOLD"

#### Stops Antenna Whipping

Screws on to rain molding of car. Protects antenna from long hanging limbs or driving into garage. Also when driving at high speeds. Hard cadmium plated finish.

Amateur  
Net

**\$1.**



AT LEADING RADIO JOBBERS EVERYWHERE

**Master Mobile Mounts, Inc.**

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*You can take it with you!*



LADIES:

take note of a charming couple... packed, ready...about to be on their way to an exciting, completely unique event.

*The first* **YLRL INTERNATIONAL CONVENTION**

MIRAMAR HOTEL  
SANTA MONICA,  
CALIFORNIA  
JUNE 24 - 26

(See QST Feb. 1955, page 49 for program, chairmen, costs etc.)

The GONSET Company, makers of the well known 2 meter Communicator reminds you that... like the lovely lady in the photograph... "you can take it with you." At home... or on your travels... Communicator is a "friend maker" of well established reputation.

all possible success to the YLRL INTERNATIONAL CONVENTION.

**GONSET CO.**

801 South Main Street Burbank, Calif.

### AN/APR-4 COMPONENTS WANTED

In any condition. NEW HIGH PRICES. Also top prices for: ARC-1, ARC-3, APR-1, APR-5A, etc.; TS-34 and other "TS-" and standard Lab Test equipment, especially for the MICROWAVE REGION; ART-13, BC-348, BC-221, LAE, LAF, LAG, and other quality Surplus equipment; also quantity Spares, tubes, plugs and cable.

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**In this top rated rig  
TVI is sealed in with**

**METEX Electronic Weatherstrip**



Viking Ranger

This inexpensive product will do the same for your own rigs. Follow the lead of Johnson and other high placed manufacturers.

For sealing your own rigs or any consumer, industrial or military equipment against RF leakage METEX Electronic Weatherstrip is highly effective and is a simple operation. It's made of highly resilient compressed knitted wire which comes in several forms to meet all normal requirements even where closure is of an uneven nature. Type TVI 20-S is

easily applied to most rigs in the home workshop. METEX Electronic Weatherstrip is the simplest and most inexpensive method for sealing in RF leakage yet devised. Try it. Results are amazing. Ham and industrial inquiries invited.



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KNITTERS OF WIRE MESH FOR MORE THAN A QUARTER CENTURY

Roselle, New Jersey



## XMTRS FOR 160 TO 2 METERS or Special Freq. 500 KC. to 160 MC.



### LETTE MODEL 240 TRANSMITTER WITH MOBILE CONNECTIONS AND A.C. POWER SUPPLY

This outstanding transmitter has been acclaimed a great performer throughout the world. Air wound plug-in coils used for high efficiency. Takes any freq. from 1.6 to 30 mc. Ideal for General Class, Novice, C.A.P., C.D., Industrial. Sold direct from our factory, ready to operate. 40 to 50 watts input, Phone-CW. Complete with 8 x 14 x 8 cabinet, 40 meter coils, xtal, tubes: 6V6 osc., 807 final, 5U4G rect., 6SJ7 xtal mike amp., 6N7 phase inv., 2-61.6's PP mod. Wt. 30 lbs. \$79.95. 80, 20, 10 meter coils \$2.91 per band. 160 meter coils \$3.60.

#### MODEL 130 FOR 120 TO 130 WATTS — \$199.50

**MODEL 242 FOR 2 METERS — 45 WATTS INPUT —** 6146 FINAL. Complete with mobile connections, A.C. power supply, tubes, xtal. Xtal mike input. Uses 8 mc. xtals. Swinging link matches 52 — 300 ohm antennas. Same cab. as 240. \$89.95. Also 6 meter model.

**150 WATT ANT. TUNER** matches any antenna, 8 x 10 x 8 cab. \$20.00. Coils extra: 160 — \$4.30, 80 — \$3.45, 40 — \$2.73, 20 — \$2.40, 10 — \$2.31.

#### VFO FOR ANY OF ABOVE TRANSMITTERS — \$49.95

Send full amount or \$25 with order — balance C.O.D.

### LETTE RADIO MFG. CO.

62 Berkeley St.

Valley Stream, N. Y.

## S.W.R. Bridge

(Continued from page 31)

$C_1$  is also tuned for minimum or a null. It may be necessary to readjust both  $C_1$  and  $C_2$  to get the best possible null. The taps on  $L_2$  may have to be moved toward the center of the coil if a good null isn't obtained with the tap near the outside. However, though there may be more than one set of conditions that will give a good null, the best condition is with the taps as close to the ends as possible. When the best reading is obtained, the bridge can be removed from the coax line and the line connected directly to the transmitter. The transmitter can then be loaded to the proper operating input.

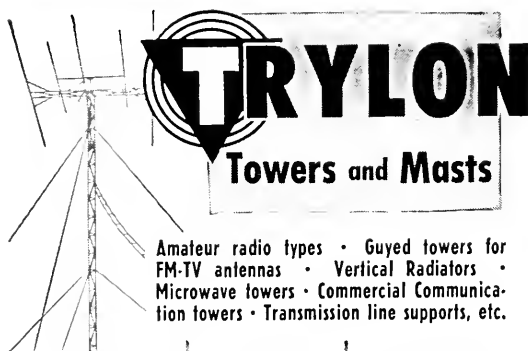
There are two points to be remembered. No matter what changes are made *at the transmitter*, they will have no effect on the match so long as the frequency is left the same as when matched. Point number two is that the controls,  $C_1$ ,  $C_2$ , and the taps, should *not* be changed after the system is matched. Again, this holds true for a given frequency. Any loading adjustments should be made at the transmitter, not the coupler.

With the system matched, it will probably be noticed that it is possible to vary the operating frequency, without retuning the antenna coupler, over a wider range than was possible before. The actual range will depend upon the antenna system. The settings of  $C_1$ ,  $C_2$ , and the taps can be noted for each particular point in the band and it then becomes a simple matter to change the controls to the correct setting whenever the operating frequency is changed.

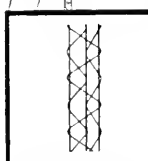
### Coax-Fed Antennas

Another place the s.w.r. bridge does yeoman duty is in the case of a coax-fed beam, such as is used on the 20-, 15-, and 10-meter bands. Assuming that we are going to match a 15-meter beam fed with 72-ohm coax, the procedure is simple. The bridge is connected to the transmitter with a piece of 72-ohm coax and full-scale reading is obtained with the output side of the bridge disconnected. After full-scale reading is reached, the line to the antenna is connected to the bridge. The matching network at the antenna is then adjusted for the lowest possible reading on the milliammeter. When a reading of zero or close to it is obtained, one can be fairly sure that the antenna is acting as a 72-ohm load for the 72-ohm coax and the s.w.r. is very low. The bridge is removed from the line and the transmitter can be loaded up. You can then be pretty sure the r.f. is going to the antenna and not being used up as heat in the feed line.

If one is interested in making actual standing-wave-ratio measurements, the Measurements chapter of the *Handbook* describes an excellent bridge that can be used for this purpose. However, for making sure your antenna system is working properly, the unit described here is worth its weight in the 24-carat stuff.



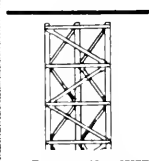
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Height to 80'  
Width\*—6.5"  
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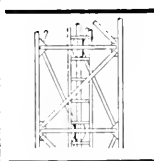
Use—Mast for TV Amateur, Portable, and Wire type antennas



#### SERIES 2400

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Width\*—22.6"  
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Width\*—50"  
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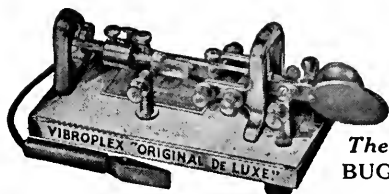
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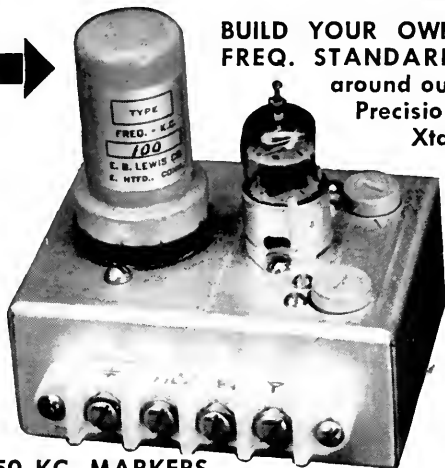
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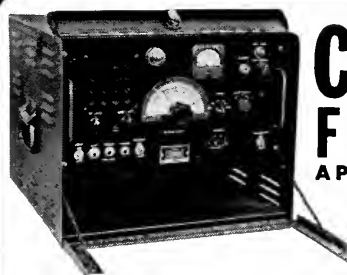
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## Hints & Kinks

(Continued from page 36)

nally employed in the voltage amplifier and the modulator require no modification when the 12AT7 is replaced with the Type 6U8. Component designations —  $C_{10}$ ,  $R_{10}$ , etc. — shown on the new schematic, refer to Fig. 1 of the article which appeared in 1952. — *Cal Hadlock, W1CTW*

## OUTBOARD VOLTAGE REGULATOR

MANY hams would like to have a source of regulated voltage for experimental use, but do not care to tie up a transformer and the necessary filter components in a supply that will be employed only at irregular intervals. The late W5LS designed an *outboard regulator* that may be used with any small power supply capable of delivering up to 100 ma. at 350 to 400 volts.

The circuit diagram of the regulator is shown in Fig. 3. Tests of the circuit, made with the output

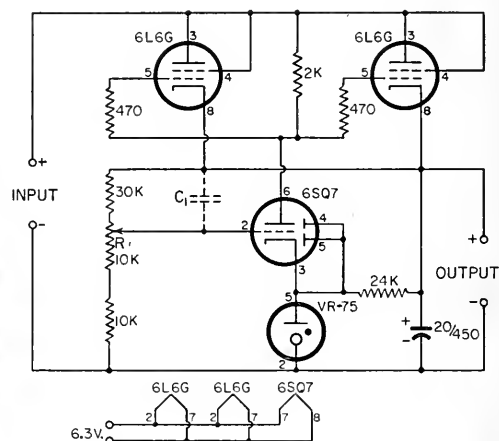
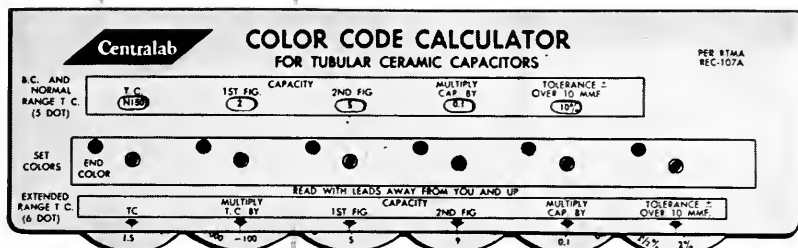


Fig. 3 — Circuit diagram of the voltage regulator. All resistors, except  $R_1$ , 1-watt carbon.

$C_1$  — Optional ripple filter, 0.1  $\mu$ f., 600 volts.  
 $R_1$  — 10,000-ohm 3-watt wire-wound potentiometer (Clarostat Series 58).

control,  $R_1$ , adjusted for an output of 225 volts, showed no voltage drop at loads as high as 77 ma. When adjusted for an output of 250 volts, the regulation was constant up to loads of 60 ma. and a drop of no more than 5 volts was measured with the load increased to 77 ma. At 275 volts, the output remained steady with loads up to 54 ma. and fell to approximately 240 volts with the drain raised to 77 ma.

Variations in the design to meet special conditions are possible. In addition to the ripple filter shown, the connection of a 0.002- $\mu$ f. mica capacitor across the VR-75 will reduce the noise amplification, in which case the 20- $\mu$ f. capacitor can be eliminated. Of course, the filament voltage applied to the regulator tubes cannot be used for equipment powered by the regulator unit. — *E. P. Prass, W5AFL*



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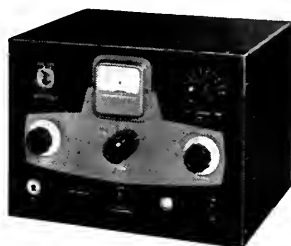
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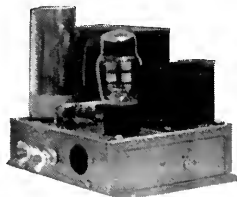
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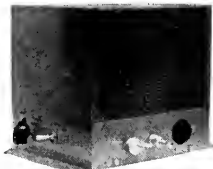
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## Correspondence

(Continued from page 46)

signal, and seems to be conscious of the fact that they have to sell the thing in the proper light. A fellow with a bad signal finds out about it quickly. The vast majority of s.s.b. operators are convinced that with the proper operation of *existing* receiving equipment, not to mention the excellent supplementary units which improve the existing equipment, there is very little justification for the criticism that s.s.b. "hogs" the bands. As a group, and through experience, they feel that the opposite is true — and a close examination of the number of individual QSOs in, let's say, any range of 10 kc. in the top of the 75-meter band, should prove the point. Any reasonably good communications receiver, properly operated, can generally receive an a.m. signal much closer to a s.s.b. station than it could adjacent to another a.m. signal. Only experience can prove this, not opinions!

My most serious concern, however, is the nature of some of the severe criticism and remarks being made about the so-called deliberate interference, and also the attitudes of some of the a.m. operators that the s.s.b. boys are supposed to restrict their operation to a portion of the band and that the rest of the band is a.m. territory only. Admittedly, there are some rotten apples in the s.s.b. barrel, and some of the s.s.b. boys are not selling a thing but trouble, but as a whole, the group does not deserve the criticism that they are receiving by a minority group. It is my personal opinion that neither group owns any portion of the band, nor any particular frequencies therein. I believe that that is also recorded as a matter of law!

It is also my opinion that these remarks have progressed, or rather digressed, to the point where they are rapidly becoming a black eye to the ham fraternity in general. I believe it is meant that the ham bands can be used for free and intelligent discussion of these issues, but that they are not meant to be used by a minority group for the purpose of insulting the person, integrity, and character of anyone who does not believe as they, the minority, do. Furthermore, this group's only sensible argument to the issue is that they are not in the minority. They are, I am sure, in the majority in number, but most definitely in the minority in attitude. This group is, I believe, the product of the influence of a certain few individuals who are using the too-popular views. They contend that the FCC is "investigating the matter, so you s.s.b. boys better get the heck out of here." Personally, I would welcome an FCC investigation of the issue, and seeing in print what the results of such an investigation would disclose.

— Elton B. Miller, W5IKE

## VIEWPOINT

Aeronautical Center Amateur  
Radio Club  
Box 1082  
Oklahoma City 1, Okla.

Editor, *QST*:

As an amateur who built and operated "wireless" equipment long before the spark-tube hassle of the Twenties, I was amused at the rantings of W4WQT in his letter published in the December issue of *QST*.

While some of us have probably not done much to unite the amateurs, we are certainly not trying to divide them over the small issue of s.s.b. versus d.s.b. We feel that the caliber of remarks used in W4WQT's letter is entirely uncalled for and inexcusable and that *QST* has struck some kind of a new low in publishing it.

— C. E. Gardner, W5AGM  
President

Brantford, Ont.

Editor, *QST*:

I have just finished reading the letter from W4WQT concerning single sideband. I quite agree with him. This is the new era and sideband is the coming thing. But at this time, I wish to say live and let live. Surely there is adequate space for all of us, no matter what our mode of operation. The amateur clan are supposed to be gentlemen; let us live up to this and try to get along in peace and harmony.

— R. Crandell, VE3AOT

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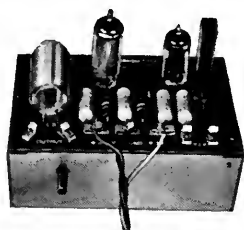
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## Happenings

(Continued from page 47)

### SECURITY RULES

*QST* has earlier reported (p. 46, August 1954) a proposal by FCC to amend our rules to exclude from eligibility for an amateur license any person who is a member of the Communist party, or Communist-front organization, or any group advocating the overthrow of the U. S. Government by force. Additionally it was proposed that only persons of good moral character would be eligible for amateur licenses; factors to be considered in this connection are former membership in above-mentioned organizations, and conviction of a felony. Because of the varied comments filed and "the legal questions which have been raised," FCC has designated the matter for oral argument to be held in Washington on March 7, 1955.

### NOVICE EXPANSION PROPOSED

In late January FCC issued a Notice of Proposed Rule Making to expand the 40-meter Novice segment to read 7150-7200 kc. This action is based on a request of the League formulated at the 1954 meeting of the Board of Directors. Date for filing comment is April 15, 1955.

Readers may recall that when in early 1952 the Commission proposed 7175-7200 kc. for Novices, the League heartily endorsed the idea but asked that the segment be a full 50 kc. FCC decided not to grant ARRL's request at that time, believing that it would be better to wait until some Novice operation there provided some experience on which to base judgment concerning a possibly larger band. As stated, in 1954 the League reiterated its request, which has now taken the form of proposed rule-making.

## World Above 50 Mc.

(Continued from page 56)

them first with a code oscillator, repeating the text on voice shortly after. This not only spreads the latest news of ARRL affairs, but also provides much-needed code practice for quite a few of the gang who do not get code experience in any other way.

W2TTU's summary in January *QST* (Fig. 5, page 13) and other long-term records show that auroral activity is not common in January, but two of the best aurora sessions in years came on consecutive nights, the 17th and 18th, of January, 1955. These did not follow the usual pattern as to time, either, both apparently getting under way around 2245 EST, and running for about two hours. This is about the time of night when auroras that have started earlier taper off. Activity in these was considerable, and reports of stations heard and worked have been received from as far east as W1BCN, out on the elbow of Cape Cod, and as far west as W7DYD and W7TMU in Washington, as well as from scores of stations in between.

For years the v.h.f. operators who take advantage of the fun and DX that only aurora sessions offer have been something of an exclusive club. You hear the same fellows in there every time. You also hear dozens of roaring completely unintelligible carriers of 'phone stations, some of them undoubtedly coming from fellows who would be amazed if they knew how far they were getting out at the time.

(Continued on page 146)

# Brand New!

Hot off the presses of Rand McNally comes this 1955 edition of the ARRL World Map. Loaded with changes that bring our "ham world" right up to the minute!

No active amateur can afford to be without one of these popular and useful adjuncts to good operating. Here is why the ARRL World Map is such a favorite:

As soon as you hear a DX station you can see exactly where he is—the country prefixes are not just listed in the marginal index; they're printed on the countries, themselves. You can tell his direction from you, and his distance. There's no question about which continent he's in—boundaries of the six continents are plainly marked.

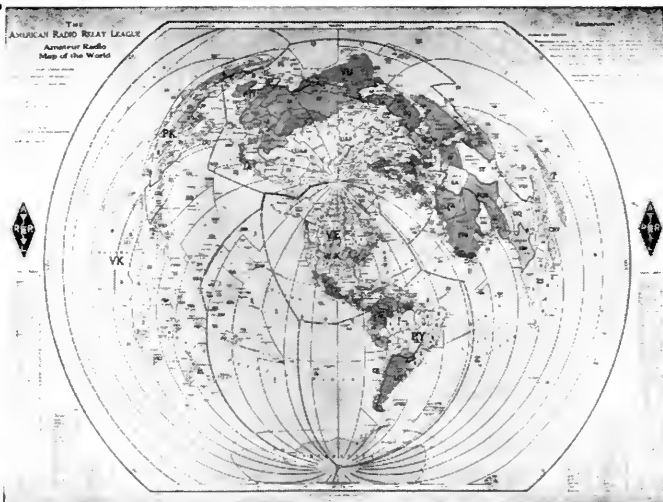
The time zones are plainly marked, too. Call areas of thirteen countries are shown. Principal cities are designated. There's a scale of miles, another of kilometers. Printed on heavy map paper measuring 40" wide x 30" high, in 8 colors that really stand out, this new ARRL World Map is easily read from your operating position.

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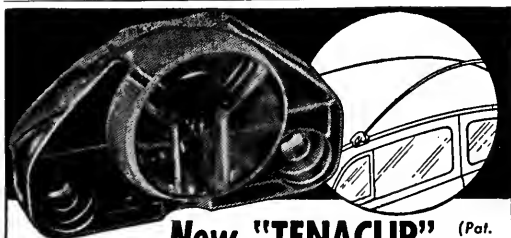
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Requiring some use and knowledge of the code, aurora DX does not get the play it deserves. Perhaps some hesitate to jump in, fearing that their lack of skill in the handling of c.w. will show up glaringly. But nobody need worry on that score. Few v.h.f. men are c.w. operators of long experience, and many are just getting their first licks in. Even if you could send and receive at 40 w.p.m., there would be no point in doing it, as experience has shown that there is little to be gained in going much beyond 15 in auroral communication. If 15 w.p.m. sounds like high speed to you, don't let that stop you; there is no more coöperative group of hams anywhere than you'll find on 6 or 2 during an aurora session. They'll be glad to work you at any speed.

So why not fix up a system for keying your transmitter right now? Then you'll be ready to partake of one of the most interesting experiences ham radio has to offer, the next time the aurora lights the northern skies. Look through the top calls in W1, 2, 3, 4, 8, 9 and 0 in the 2-meter states-worked box. Almost without exception, they got there via the auroral route. There's no easier way to move up the ladder, and you'll get the thrill of your ham career when you join the aurora club!

**OES Notes**

W1UIZ, Salem, Conn. — Nightly skeds with W1WHC/1, Wellfleet, Mass., indicate that this 120-mile path can be covered regularly on 144 Mc. with readable voice signals. This is at 2130, and is followed at 2200 by a similar check with W1YQI, Marblehead, Mass. The latter circuit, about 100 miles, is also consistent. Planning gear for 1215 Mc.

W2ORA, Collingswood, N. J. — Round-table in Philadelphia area each Monday at 2030 is big help in keeping the 6-meter gang together. As many as 12 stations participate, and more are invited. Heavy antenna damage during fall hurricanes has now been largely repaired.

W3KLA, Baltimore, Md. — Equipment under construction: coaxial tank circuit for 4X150A, amplifier for 144 Mc., will also operate as doubler to 220. W3YQD now keeping nightly sked on 220 with W4UMF, Arlington, Va., at 2115.

W3OTC, Silver Spring, Md. — 50-Mc. activity holding up well during winter months, with good turnouts for Sunday-morning and Monday-night sessions. Extraordinary 50-Mc. reception during Sunday morning of V.H.F. SS. W1FZ, Farmington, N. H., answered CQ, but faded out before complete exchange could be made. W3OJU, Washington, D. C., also heard W1s briefly during same period. As no exceptional tropospheric signals were heard, this one period of 400-mile reception appears to have been an extra-long meteor burst, or some other form of short-duration reflection.

W3UQJ, York, Pa. — Would like to see QST box listing accomplishments of 220- and 420-Mc. stations, similar to 2-meter box. After several months of regular skeds on 220 Mc. with W4UMF, and contacts with Maryland, there now seems to be some probability of a Pennsylvania contact, as two 220-Mc. stations are being built by York-area hams.

W4HHK, Collierville, Tenn. — After more than a year of almost daily observation of meteor-burst signals on 144 Mc. there appears to be a lag of a day or so between the predicted peak of a meteor shower and the maximum results on the 2-meter schedules. Daily tests with W1HIDQ and W2UK continue, working schedules permitting.

W5FPB, Albuquerque, N. Mex. — Though there are about 40 hams in the area who can get on 144 Mc., few show up regularly on net. C.d. group would like 2-meter mobiles for their communications plan.

W6ZDO, Canoga Park, Calif. — Nightly transmission on 431.5 Mc., 2000 PST. Receiver for 1215 Mc. completed, and work started on transmitter.

W7JHX, Port Orchard, Wash. — Completed new a.f.c. system for 10,000-Mc. gear. Seems extremely stable, holding over wide frequency range.

W7JRG, Billings, Mont. — Gear for 432 Mc. about completed, including 4X150A coaxial-tank tripler, 16-element array with plane reflector, and crystal-controlled converter with two lighthouse-tube r.f. stages. Also working on balanced modulator for s.s.b., 3.9 to 50.4 Mc.

W7NVO, Boise, Idaho — Working on 145.44 Mc. in Boise Valley 2-meter net.

W9LEE, Westboro, Wisc. — New power supply completed; now running 600 watts on voice. Continuing 0745 skeds with W0B3N, but 2130 sked discontinued. OBS trans is sions nightly, except Monday and Friday, as follows: west — 1955; southeast — 2000. Frequency — 144.12 Mc.

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379 401 422 485 506 529	446 466
380 402 423 486 507 530	447 468
381 403 424 487 508 531	448 469
383 404 425 488 509 533	450 470
384 405 426 490 511 534	451 472
385 406 427 491 512 536	452 473
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4495 5940 6325 6925 7675 7975	4535 5750 6350 6950 7700 8260
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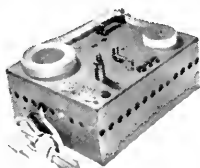
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## YL News & Views

(Continued from page 54)

meeting, W6JZA, Elsa, accepted the post of "Hospitality Chairman" for the YLRL Convention in June with K6ANG, Billie, assisting her. . . . The Christmas day issue of the *Troy Record* featured an article on K2IRF, Pamela Proctor, of Watervliet, N. Y. . . . Chairman of the *YL Harmonics* cover contest W2EEO, Madeline, and committee K2AMZ, Alda, W2NA1, Marge, and KN2J11Q, Barbara, announce as first-prize winner W2JZX, Vi, and second-prize winner VE3AJR, Dell. . . . W6ERR, Ann, is working out well with a new single-sideband Slicer, Christmas present from her OM. . . . W1AHS, Ruth, of Providence, R. I., was formerly active as W4BPF and Lucile, ex-W4KZT, is now KP4ZV. . . . New harmonies were recently born to W4UTO, Mary Ann, WN4HML, Rosie, and W8KLZ, Betty. . . . YLRL chairman of the Fourth District, W4RLG, reports three new YLs in Alabama: K4BGH, Judy, Silverhill; KN4AFZ, Marie, Birmingham; and KN4APF, Ann, Adger. Frances also tells us that W4TVO, Lorraine, is manager of the Virginia 'Phone Net; W4WJX, Dean, is president of the Birmingham ARC, and W4WTJ, Betty, is treasurer of the Mid-South ARA. . . . W4DEE, Beulah, and W4YJD, Chris, invite interested YLs to join them on s.s.b. each Tuesday at 2:30 EST, 14,292 kc. . . . W1VXC, June, is the new PAM for Rhode Island. . . . W4UMI, Eleanor, is home after spending several months in a hospital. . . . W3s GYU HUX MBI SPV participated in the January V.H.F. Party on 2 meters. . . . The daughter of W8FPT, Wava, is now WNSUVV, Jeannie. . . . W1YPT, Louise, is Secy.-Treas. of the Cape Cod and Island Net on 75' phone. . . . W1VOS, Marge, has her first endorsement for her YLCC certificate. . . . Using her OM's call W6MBD, W6QOG, Helene, now has 160 countries worked on 'phone. . . . W6WSV, Carol, gives the results of the recent officer's election of the San Francisco YLRC: W6QMO, Pres.; W6PCN, Secy.-Treas.; KN6GDC, KN6HIW, Board of Governors. . . . W6QMO, Jeri, made BPL again in December.

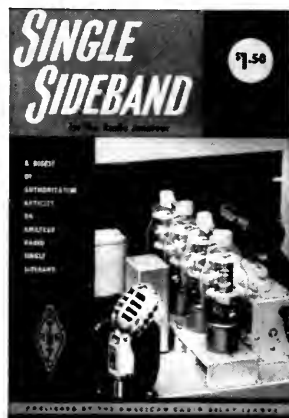


W8GJX, Helen Cloutier, gives credence to the conclusion drawn many times that a busy YL always finds time to do still more. Last November, Helen became the first YL to receive membership in the Quarter Century Wireless Assn., thus honoring her 25 years of amateur activity. From a start with a 15-watt Hartley rig and a Silver-Marshall receiver, W8GJX has progressed to a 400-watt TVI-suppressed transmitter and assorted fixed-station and mobile gear. Besides being an active operator, Helen is the mother of sons W8QFD and W8UED, a "variegated hobbyist," and a career woman. Author of several books, including *Sim Barton, Girl Radio Operator* (story of a young girl's determination to achieve success as a First Class ship's radio operator), Helen is pictured at the console of station WESK, NBC, Escanaba, Mich., where she is continuity director and supervisor of women's activities. W8GJX maintains that her many amateur experiences have directly stimulated her other pursuits and interests.

# SINGLE SIDEBAND

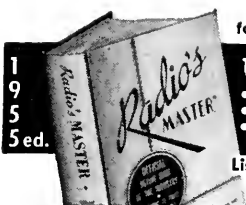
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## Net Know-How

(Continued from page 63)

phrase and mentally repeat it two or three times before going on to the next phrase. Of course, if the receiving station is using a typewriter you can speak more rapidly. A number of voice operators have learned through experience how to prolong certain syllables and add certain "nieeties" to make the words more intelligible. Proper enunciation of numbers is vital since they occur so frequently in texts of emergency traffic as well as in addresses and telephone numbers. Recommended phonetic substitutes used *only* when required can be of tremendous value.

### Stick to Business

During net operations all communications should be limited to the serious business at hand; rag chewing and nonpertinent discussions should be eliminated. All transmissions must be aimed toward moving the traffic on to its destination.

The pamphlet "Operating an Amateur Radio Station," published by the ARRL, is required reading for every active ham. It's available on request and without charge to League members and to others for twenty-five cents. The chapters on Emergency Communications, Message Handling and Network Organization are especially pertinent to the present subject.

In conclusion:

LISTENING and a silent transmitter are often more important and more helpful than transmitting.

TRAINING and familiarity with standard procedures are basic requirements for helpful participation.

NET DISCIPLINE and compliance with orders from the established net control station are essential to best success of the amateur effort.

ACCURACY and exactness in both transmission and transcription of messages is more important than speed for speed's sake.

PARTICIPATION in an emergency net imposes responsibilities beyond reporting in with an offer to help and then leaving the net at will.

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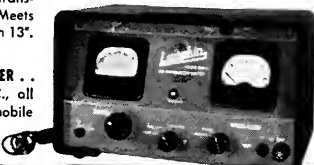
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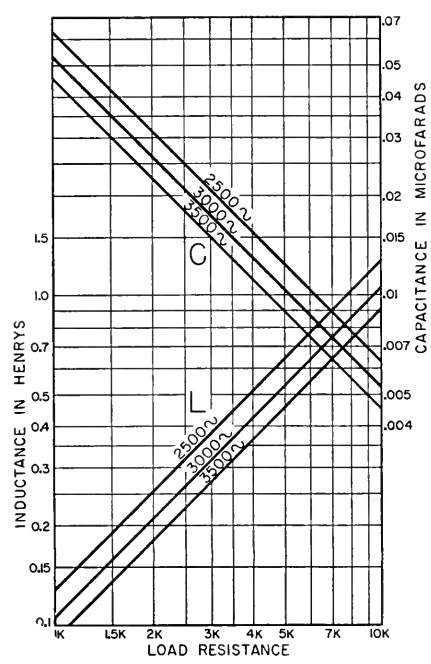
**TENNALAB • Quincy, Illinois**

**FEED-BACK**

In Turner, "A Steerable Array for 7 and 14 Mc." in the February issue, Fig. 1 should show  $L_1$ ,  $L_2$  and  $L_3$  as 7 turns instead of 8.

— . . . —

The splatter filter chart appearing as Fig. 3, page 19, December *QST*, in the article "120 Watts of Audio Without Driving Power," was incorrectly drawn. The accompanying version is the proper one.



Although values taken from the chart in December *QST* will not be theoretically correct, it is doubtful whether a design based on them will show a material improvement in actual performance if the values are corrected to conform with the accompanying chart. This is because there is wide latitude in the selection of a frequency in the first place, and because it is difficult to obtain the exact values of inductance and capacitance called for in the ideal case. In other words, use the chart herewith if you're starting out fresh, but don't worry about the performance of a filter already built from the December data.

— . . . —

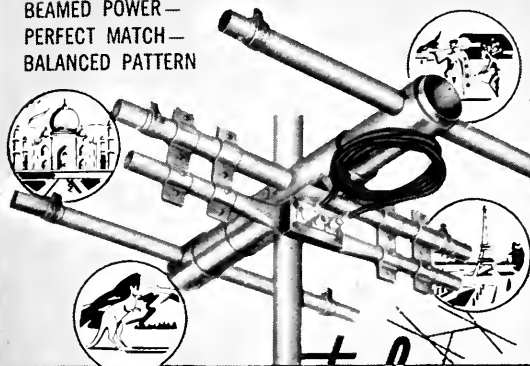
In an editor's note in the correspondence column on page 138 of the January issue, reference was made to the ARRL Safety Code. The code was published in the issue for June, 1953, not 1952 as stated.

— . . . —

Re the circuit diagram of W6RET's crystal-controlled converter on page 34 of the December issue, the positive 175-volt supply should be connected at  $C_3$ , rather than  $C_7$ , so that the voltage to the 6J6 will be reduced.

# For "top-man-on-the-frequency" results!

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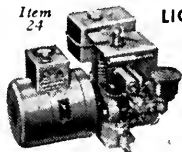
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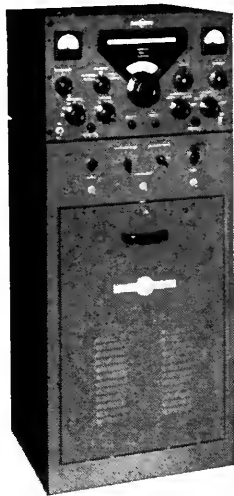
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# HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature, and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1) (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested that name and address be printed plainly. Typewritten copy preferred.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

*Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.*

QSLs? QSLs? State-map? Rainbow-map? Cartoons? Largest variety QSL samples, 25¢ (refunded). Rus Sakkers, W8DED, P.O. Box 218, Holland, Mich. Callbooks (Spring), \$3.60.

QSL-SWLS Meade W0KKL, 1507 Central Avenue, Kansas City, Kans.

QSL-SWLS. 100, \$2.85 and up. Samples 10¢. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLs, SWLS, America's Finest!!! Samples 10¢. C. Fritz, 1213 Briar-gate, Joliet, Ill.

QSLs, SWLS. Fair prices for excellent quality cards. Eleven styles for you to choose from. Samples, 10¢. Almar Printing Service, 423 Barker Bldg., Omaha, Nebraska.

DELUXE QSLs. Petty, W2HZA, Box 27, Trenton, N. J. Samples, 10¢.

QSL-SWLS. Samples, free. Bartinoski, Houlton, Me.

QSLs. Samples free. Albertson, W4HUD, Box 322, High Point, N. C.

QSLs! Two colors, \$2.00 hundred. Samples for stamp. Rosedale Press, Box 164, Asher Station, Little Rock, Ark.

QSLs "Brownie." W3CJL, 3110 Lchigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

QSLs! Taprint, Union, Mississippi.

QSL-SWL cards, Sensational offer, Bristol stock 500 1 color \$3.95. 2 color \$4.95, 3 color \$5.95. Super gloss \$1.25 extra. Rainbow cards. Samples. QSL Press, Box 71, Passaic, N. J.

QSL samples. Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

QSLs. Postcard brings samples. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

QSL-SWLS, as low as \$1.50 per color. Samples dime. Stronberg, P.O. Box 151, Highland Station, Springfield, Mass.

QSL-SWLS, Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

BEAUTIFUL QSL cards from World Printing. Samples free. 166 Barclay Ave., Clifton, N. J.

QSLs, personalized. 150. \$2.00. Samples, 10¢. Bob Garra, Lehighton, Penna.

QSL-SWLS, samples free. Backus, 5318 Walker Ave., Richmond, Va.

FLUORESCENT QSL-SWL cards. Samples 10¢. Kimball, 1545 Vine, Denver, Colorado.

QSLs. Nice designs. Samples. Besesparis, W3QCC, 207 S. Balliet St., Frackville, Pa.

QSLs. Samples-dime. Printer, Corwith, Iowa.

QSLs! Exotic colors and designs; 2 days service. \$3.85 for 100. Satisfaction guaranteed. Be surprised! Constantine Press, Bladensburg, Md.

FINE quality QSLs, 100, \$2.75. Oscar Craig, Newark, Arkansas.

BEAUTIFUL QSL cards from World Printing. Samples free, 166 Barclay Ave., Clifton, N. J.

QSLs: 2-color 150, \$2.00. Samples, 10¢. Bob Garra, Lehighton, Penna.

QSLs, SWLS. High quality. Reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

QSLs. New. Different. Samples, 10¢. Graphic Crafts, Rt. 12, Ft. Wayne, Ind.

QSL-SWLS. Samples free. Backus, 5318 Walker Ave., Richmond, Va.

PERSONALIZED QSLs, SWLS. Varicolored specials. Samples 10¢. Snyder, W9HIU, 113 Harrison, Jeffersonville, Ind.

QSLs! Modern, better quality designs. Samples 10¢. Tooker Press, Lakehurst, N. J.

QSLs: 10% discount to back-logging eager beavers. 15 samples, "Super-Speed Specials", 10¢. Robinson, W9AYH, 12811 Sacramento, Blue Island, Ill.

QSL-SWLS. Rainbows, Cartoons, others. Reasonable. Samples 10¢ (refunded). Joe Harms, W2JME, 225 Maple Ave., No. Plainfield, N. J.

QSLs, Distinctively different. Postpaid. Samples free. Dauphinee, K6JCN, Box 66009, Mar Vista 66, Calif.

FOR Sale: National One Ten receiver with power supply and speaker, Eldico Antennascope, 2-in. MM-2 oscilloscope. Best offer takes them. L. Ingalls, W0VOY, Tracy, Minn.

VS Baby mobile antenna. Satisfied XYL mobile antenna problem. Beautifully chromed, only 4 ft. high. High Q, weatherproof plug-in loading coils. Changes bands instantly. Top section resonates antenna to operating frequency. Becomes regular car whip when coil is removed. Perfect for Gonset, Elmac, Viking, etc. Bandswitching transmitters. Tiny but effective on all bands. Replaces regular cowl or fender broadcast whip. Easily installed in a few minutes. Coils available 75 thru 10 meters. With all mounting hardware and one coil, \$12.95 each. Specify band. Other coils \$2.75 each. W6VS, Bill Davis, 225 Cambridge Ave., Berkeley 8, Calif.

USED commercial FM communications equipment bought and sold. W2FOU, Allan M. Klein, 95-33 225th St., Bellerose, L. I., N. Y.

CASH Paid for BC-610-E xmitters; BC-614-E. Sp. amplifier, BC-939 or 729 ant. tuning units, also BC-221 freq. meters, TCS and others. Technical manuals wanted. We need Sig. Corp. Navy and Air Force stock catalogs; maintenance and instruction. FM's for war surplus equipment. Amber Co., 393 Greenwich St., New York 13, N. Y.

REAL bargains: New and reconditioned Collins, National, Halli-crafters, Hammarlund, Johnson, Elmac, Barker & Williamson, Gonset, Morrow, Babcock, RME, Harvey-Wells, Millen, Meissner, Lyco, Sonar, Central Electronics, all others. Reconditioned S40A \$69.00, S40B \$79.00, S76 \$129.00, SX71 \$159.00, NC57 \$59.00, NC98 \$119.00, NC125 \$129.00, 11R0501 \$269.00, 11R060 \$339.00, 31A00S \$259.00, 11T20 \$299.00, 32VL \$345.00, 32V2 \$445.00, 75A2, 75A3, Viking I, Viking II, 11T9, NC183D, many others cheap. Shipped on approval. Easy terms. Satisfaction guaranteed. Write for free list. Henry Radio, Butler, Missouri.

COLLINS 32V3 \$500; Collins 75A3 \$450; General Electronics SSB 20A, exciter, \$200 — all in original boxes, used very little. Hodgeman, W9BSG, Box 298, Odell, Ill.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS: Radio publications. Latest Call Books, \$3.50. Mrs. Earl Meall, Huntley, Montana.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9Y1V, Troy, Ill.

WANTED: All types of aircraft radios, receivers and transmitters. Absolutely top prices. Daimes, W2KUW, 308 Hickory St., Arlington, N. J.

WANTED: Early wireless gear, books, magazines and catalogs. Send description and prices. W6GH, 1010 Monte Drive, Santa Barbara, Calif.

CODE slow? Try new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

URGENTLY need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

DON'T Fail! Check yourself with a time-tested Surecheck Test. Novice, \$1.50; General, \$1.75; Amateur Extra, \$2. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minn.

MICHIGAN HAMS! Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michi-gan. Tel. 8-8696, No. 8-8262.

WANTED: ART-13 transmitters. Write James S. Spivey, Inc., 4908 Hampden Lane, Washington 14, D. C.

CALL-SIGNS: Mobile, Shack, Lawn-stake, \$1.00 and up. Free literature. Kallsigns, 2029-A Bradley, Chicago 18, Illinois.

COMMUNICATIONS Engineers and Technicians! Excellent salaries, minimum requirements. Engineer: Graduate with 3 years experience. Technician: Teachers school in communications and 5 years experience. Require installation, adjustment, and maintenance experience with communication receivers and associate terminal equipment. Also, men with similar experience with high-powered transmitters, antennas, transmission lines. Must be willing to travel in United States and overseas. Write: Page Communications Engineers, Inc., 710 Fourteenth St., N.W., Washington 5, D. C.

OUTSTANDING ham list always. Our prices on trade-ins of all amateur brands are realistic and down to earth. We feature Johnson, National, Collins, Halli-crafters, Gonset, Elmac, Harvey-Wells, Morrow, Central Electronics and other leaders. We trade easy and offer our own time-payment plan tailored to fit you. All leading brands of new equipment always in stock. Write today for latest bulletin, Stan Burghardt, W0BJV, Burghardt Radio Supply, Inc., Box 41, Watertown, S. Dak.

ANTENNA for bandswitching transmitters up to 300 watts input, approx. 20 feet long, center with 75-ohm line, 70 feet included, low SWR, tunes 80-40-20-10-meter bands. U. S. Patent 2,535,298. Each one tested for resonance on all bands. Send stamp for details. \$18.95 each. Lattin Radio Laboratories, 1431 Sweeney St., Owens-boro, Ky.

NEED ART-13. R. Ritter, 4908 Hampden Lane, Bethesda, Mary-land.

RECEIVERS repaired, aligned. Collins modifications by competent engineers, using factory-standard instruments. Prompt service. Our ninth-month year. Douglas Instrument Laboratory, 176 Norfolk Avenue, Boston 19, Mass.

JOHNSON Viking II (TV), \$210.00; Johnson VFO, \$22.50; Johnson low pass filter, \$9.00; Balun coils (2), \$4.00; Vihroplex Bug, \$8.00; Paul Gaynor, 400 East 52nd St., New York 22, N. Y. Tel. Plaza 9-2900 after 6 P.M.

WANTED: APR-4, ART-13, ARN-7, APR-5, CU-25, RA-34, ARC-1, ARC-3, TDQ, BC-221, TS-173 etc., BC-342, BC-312, BC-348, BC-610, BC-614, BC-939, APR-4, BC-610 tuning units, DY-12, DY-17, Boehme, Teletype. Technical Manuals, Supply Catalogs, APQ-13. Amateur receivers, transmitters, 75A, 12V, cash or trade for new Viking, Ranger, National, Hallicrafters, Gonset, Morrow, Barker Williamson, Elmac, Central Electronics, Telrex, beams, C-D Rotators, Jones Micromatch, National, etc. Write: Alltronics, Box 19, Boston 1, Mass. Richmond 2-0048 (Tom Howard, WIAFN) New & Used equipment at 44 Canal St., Boston, 60 Spring St., Newport, R. I.

BARGAINS: With new guarantee: R-9'er \$14.95; S-72 \$59.50; S-54 \$35.00; S-401 \$79.00; Lysco 600S \$139.00; SX-57 \$99.00; SX-43 \$129.00; S-70 \$149.00; SX-71 \$169.00; SR-75 Novice transceiver \$49.50; SX-42 \$189.00; HRO-50 \$275.00; HT-17 \$32.50; EX Shifter \$39.00; Globe Trotter \$49.50; Harvey-Wells SR \$69.00; DeLuxe \$79.00; Viking I \$209.50; Viking II \$259.00; New SS-75 \$189.00; early HT-9 \$139.00; Globe King 400B \$359.00; 32V1 \$395.00; 32V2 \$450.00; 32V3 \$550.00. Free trial. Terms financed by Leo, W9GFO. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

GONSET 3003 1-6.4 mcs \$29.95, 3008 two-meter \$24.95, 3028 Signal-Slicer \$19.95, 3030 Super-Six \$39.95; Hallicrafters S-16 \$69.95, S-38 \$34.95, S-38C \$39.95, S-40 \$69.95, S-72 \$59.95, S-81 \$34.95, SX-42 \$179.95, SX-43 \$129.95, SX-62 \$250.00; Howard \$45 \$39.95; Lysco 133 \$19.95, 210 \$19.95; National HF5 \$29.95, HRO-M \$15.00, BC-614 \$64.95, NC-183D \$299.95, SW-54 \$34.95, Policalarm PR-7, PR-9, \$29.95; RME DB-20 \$29.95, HF 10/20 \$59.95, MB-3 \$14.95, VHF 2-11 \$99.95, VHF-152 \$49.95; Collins 32V2 \$475.00, 32V3 \$595.00; Harvey-Wells APS-50 \$29.95, TBS-50 \$79.95, TBS-50D \$99.95; Lysco 381 \$14.95, 381-R \$19.95, 401 \$99.95, \$579.95, other used items available; free list from W1BFT, Evans Radio, Concord, N. H.

FOR Sale: Complete station comprising Hallicrafters SX-71 receiver and TV-2000, 250W, 813 phone transmitter, complete with power supplies — \$375.00 takes all. Equipment like new. E. M. Gilbert, W30WZ, 824 Milford Mill Road, Pikesville 8, Md.

FOR Sale: TBS-50 Harvey-Wells Bandmaster; PE-103; Mark II transmitter/rcvr. Will take best offer. Will consider trade for new NC-125, Bruce Marsh, W6N1W, 2603 W. 179th St., Torrance, Calif.

WEST Texas, Eastern New Mexico hams! We both lose unless you get our deal on all leading lines of ham equipment first. Let us quote and you will agree. Tom W. Conner, W5U1J, T & F Sales Company, 1100 N. Lynn Avenue, Lamesa, Texas. Tel. #4757.

FOR Sale: Sonar SRT 120P, latest 1954 model. Complete with power supply and VFO. Factory-wired, used only 1 month: \$200. Also: 1 G-E 5894 tube, brand new; \$14. J. Klein, K2GST, 235 Lyons Ave., Newark, N. J., Phone WA 3-3025.

FOR Sale: Meissner Signal Shifter. Late turret type. Used only a few hours building and testing a KW final. Looks new. \$50. SCR 511 Walkie-Talkie 75 meters. Complete and brand new, in original packing, instruction manual: \$20. W7CVP, 837 Park Hill Drive, Billings, Montana.

COLLINS 32V2, like new. Commercially modified to V3 Specs. Very low mileage. No time for use. Will accept reasonable offer. E. S. Grainger, W2NXZ, Box 186, Brightwaters, L. I., N. Y.

SELL: ARRL inverter. Input: 110V. DC output: 110V, 50-60 cycles, 250 W intermittent, 150 W continuous. Best offer. A. Simon, W6TTP, 825 Idaho Ave., Santa Monica, Calif.

FOR Sale: NC-98, with speaker, practically brand new, less than ten hours time on it. \$100 takes it! Barton Krawetz, 26-40 211 St., Bayside, L. I., N. Y. Tel. BA 5-3647.

PROTECT QSLs permanently: clear laminated plastic, 10 for \$1.00. Sample your card, 15¢. Thomas Hark, 500 42nd St., Charleston, W. Va.

20 Meter beams: end loaded; more effective, hi-Q; one-third the size! Build yourself and save half! Only \$2.00 for full plans and instructions! Ted Long, K2EUO, 46-41 Hanford St., Douglaston, L. I., N. Y.

SALE: Millen 90810 HF transmitter with tubes, 10 and 6 meter coils, instruction book. Never used! Also: VHF 152-A, used about six hours. Best offer takes both. G. Cloer, Jr., W4SDW, 801 No. Main St., Salisbury, N. C.

WANTED: Lambda modulation 'Scope. Robert F. Haas, W4SDM, 49 Grandview Ave., Ft. Thomas, Ky.

VIKING II, like new, VFO. Matchbox, LP filter, SWR bridge, D104 mike, F.o.b. Wilmette, Ill. First \$300 takes it. W. J. Dee, W9JKL, 1341 Elmwood, Wilmette, Ill.

BACK numbers of electronics magazines. Where to buy, sell. Lists 70 dealers, \$1. Box 4946, Ft. Lauderdale, Fla.

SELL: Hallicrafters SX-71, in original carton, with instruction book. In excellent condx, \$195. Thomas Comport, W9RQN, 124 No. Orchard St., Madison, Wis.

FOR Sale: Collins 75A3, speaker, 3 Kc, 6 Kc fltrs, used about 20 hrs. No time, married! \$450 or best offer takes. M. Levy, W6WGI, 1111 No. La Cienega Blvd., L. A. 46, Calif.

NOVICES! Complete station: includes Heathkit AT-1, xmtr, 540BEC, with J38 key; almost new! Bargain at \$125. Molis, Jr., W9JFH, 3419 West 121th Place, Chicago, Ill. Phone: Hilltop 55-1164.

SELL: Lysco equipment, never used, model 382 mobile VFO, \$28; #129T mobile 10M, transmitter \$26.00; #50 ant. coupler, \$11; #30 noise limiter \$8.00; #401 Clammaster, \$16 and #912 marine radiotelephone, \$60. W2BAY, P.O. Box 305, Haddonfield, N. J.

SELL: Tape recorder, 5 rolls 1200' tape, mike, Ekotape, Model 116, year old, excellent condx, \$100; generator, 1000 wts, continuous, 1800 starting. Cost: \$276; 115 A.C. Sell \$200. Gerard Moor, W10GY, 53 Garland Ave., Cranston, R. I.

BARKER & Williamson 5100 transmitter, D104 mike and stand; antenna matching coils, slightly used. All for \$385. Al Paris, K2ZHD, 28 Graham St., Farmingdale, N. Y.

FOR Sale: Power supply 1460 volts at 350 Ma. W4WEL, Rocky Mount, N. C.

FOR Sale: General Electric CRO3A oscilloscope, \$50.00. AN/ARC-4, A 140-144 M; transmitter-receiver, new with manual, \$50. M. Schumacher, Lomira, Wis.

SELL: Gonset Communication, used ten hours, \$150. WRK Globe Scout xmtr model 40A, \$55. Frank Schneider, K2EOA, 588 Kinsella St., New York, N. Y.

WANT Millen 90881 power amplifier with coils, less power supply. State condition and price prepared for shipment. John Diebold, W7SCU, 1944-8th Ave. West, Seattle 99, Washington.

FREE Bargain Bulletin. Visit store for thousands of unadvertised bargains. New BC610 tuning units TU-47, TU-48, TU-49, TU-50, TU-51, TU-52, \$5.95 each. Surplus RG-8/U cable, 100 ft., \$3.95; 250 ft., \$13.25, 500 ft., \$25.00. Selsyns, 110 volt size 5, \$12.95 pr. 1000 Kc standard crystals, \$2.95. Wanted: Surplus radio equipment, Navy synchros. Letricone Research Laboratories, 719 Arch St., Phila., Penna.

WANTED: Good ham transmitter, etc. Will buy, or will trade for it 4 x 5 Graflex 4.5 lens; German Welta 120 2.8 lens and Balda 35 mm 2.9 lens; DeJure exposure meter; Solar 5 x 7 enlarger; 3.5 lens; dryer, flash, tanks, trays, lights, etc. Watcha got? Don Cooley, 24 Dean St., Gainesville, Ga.

WHAT do you do when power fails? Wish you had a PE101-C dynamotor? Easily converted to 6VDC input 300VDC at 90 Ma, and 160VDC at 110 Ma, output, Conv. data with units or leave at 12VDC input 610VDC at 150 Ma, 325VDC at 125 Ma, output. Brand new in original boxes. \$6.10, 131 lbs, or wud you like a 6VDC 400VDC 100 Ma. Vibrapack complete, \$12.50; 5 lbs; 2-meter xtal, \$15.00. KC, FT-243 base .95. Gallagher's Service, John, W2VAQ, Voiceville, N. Y.

BC348-110A-C, \$85. Heathkit GDO with BC coils, \$15; 522 xmtr w/tubes, no mod. xfrm, \$10; BC221 w/T.M., \$75; Gonset Noise Limiter, \$5; 160M ARS w/tubes \$10; Electronic bug, \$10. No swaps. Leo Liebl, P.S.K., Medford, Wis.

BACK QSTs, 1935 thru 1945, complete run, \$8.00. Residence post-war C.R.E.I. course, 25 vols, \$10. W3NHA.

SALE: Viking II, \$225; SX-71 with spkr, \$150; Viking VFO, \$30; Electro-Voice mike Model 950 with stand, \$15; ant. coupler w/2-2.5 RF ammeter and 20, 40, and 80 coils; RF relay, \$20; Drake 1P filter with 4 coax connectors, \$9. All equipment in excellent condx. J. Sommer, W8KQD, 950 Irving Ave., Dayton 9, Ohio.

COLLINS 30K-1, w/310A driver; cannot be told from new. \$975. Will take 32V-1, V-2, B5AV \$100, or Viking in trade. Would consider other small commercial gear in trade also. W4LEF, Dan Edwards, 208 Fremont Ave., Tampa, Fla.

DAYTON Hamvention is the best treat in ham radio. See Hamfest Calendar this issue.

WANT: CQ January 1946, QST 1922 and prior. Clifford Storch, 5 Winfield Terrace, Great Neck, L. I., N. Y.

HEATHKIT AT-1 transmitter, \$29; VFO, \$19; both used less than an hour, excellent wiring, W5SVB, Gifford, 1412 No. Manhattan, Amarillo, Texas.

REVERSE Tape Recorder, Mod. T700 (keyboard type), with foot control, less than year old. Trade for Elmac AF67 and AC supply, or the equivalent. Henry Kampe, W9OKM, 1207 Oneida St., Joliet, Ill.

SELLING cheap: transmitters, tubes, meters, beams, Variacs. Send for list. E. L. Felder, Tylertown, Miss.

ATTENTION! Eldico TR-75TV transmitter, AM-40 modulator, Boston St., Middletown, Conn. In excellent condition. Write to W1ZHE, Boston St., Middletown, Mass.

FOR Sale: QSTs 1932-1952, complete run; \$25. Also early call books. R. Van Wuyckhuysse, W2CR, 412 Humboldt St., Rochester, N. Y.

FOR Sale: Johnson Viking I, with TVI kit, VFO, Ant. relay. Excellent condx: \$240.00. Billy Horner, Sanford, N. C.

ANTENNA impedance bridge schematic with illustrations and discussion, \$1.00. Econo-Craft, Box 103, Oak Ridge, Tenn.

HRO-60 with four coils, in like-new condition, \$395 complete; Hallicrafters S-36A with matching speaker, excellent condx, \$100; Collins 75A2, late model, \$325; steel case transformer 2500 volt ct. 350 mls, \$15; case 300 ml 4 Henry choke, \$3; 866 filament transformer, \$4; BC-453 converted, excellent, \$25; power supply for BG-453, \$20; BC-454, \$10; BC-455, \$10; BC-456, \$5; BC-1206A, as is, \$1; large surplus 2P1P switches, \$2; 1P2T, \$1. John Huey, W9AMU, 390 Hill Ave., Elmhurst, Ill.

ARRL Staff opening: A licensed amateur is desired for opening in the Communications Dept. Work comprises consolidation field contest, emergency and traffic reports; may involve administrative organizational matters. Salary commensurate with experience and functions. Get your application in without delay; when post is filled applications will be held for other possible openings. Long experience not required, preference single amateurs interested combining hobby and career. We'll send personnel form for data on age, license, and resume of experience. Inquiries welcomed and will be held confidential. Write Box A, ARRL Hq, West Hartford, Conn.

COLLINS 32V3, new condition with spare 4D32, \$535; HRO-60, like new, complete with xtal calibrator, \$389; F.o.b. Worcester, Mass. W1KC, 240 Moreland St., Worcester, Mass.

MOBILE Station, complete: Elmac, PE-103, Gonset Super-Six, Band-Spanner, etc. Will exchange for Hi-Fi unit or cash. G. G. Petersen, West Branch, Iowa.

FOR Sale: 15 watt VFO/exciter, \$50; 75-watt 829B xmtr, complete, \$70; 500 Kc xtal calibrator, \$12; 832-A tubes, \$15 pair; all items postpaid. Robert Clough, W2PC1, 172 Boulevard, Pompton Plains, N. J.

COLLINS 310B-3, like new, no changes, little use by single owner. In original carton with manual, \$200. R. B. Parker, W1AJZ, 38 Ayer Lane, Harwichport, Mass.

SELL: Hallicrafters S-40A unused, like new, \$60. Also HRO60. Swap: latest 3 1/4 x 4 1/4 Speed Graphic outfit complete, extras, case for clean HRO or 183D rcvr. R. Long, 933 E. Broadway, So. Boston, Mass.

SALE: Knight wire-recorder, in excellent condition. Has turntable for playing records. Complete with two reels of wire, \$25 F.o.b. Tucumcari, N.M. W5NUN, P.O. 818, Tucumcari, New Mexico.

FOR Sale or trade for receiver: Type 827R tube, never used. Cos over \$150. W9BYX, Vogel, 205 Evergreen, Elmhurst, Ill.

75A1, speaker, \$225; SX-43, speaker, \$119.50; 3" Panadapter, \$54. Hundreds of other items, list for 3¢ stamp. W9ERU, 2511 Burmott Road, Rockford, Illinois.

SELL: Viking II with VFO, in original cartons: \$300. 7001.25 band-edge crystals, \$1.75. NC-173 receiver, \$140. Need 75A2 or 75A3. W2AEV, Jones, 14 Carol Rd., Bethpage, L. I., N. Y.

WANT: Johnson rotator. Sell television receiver, \$30. WAAPT, 1420 South Randolph St., Arlington, Va.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. See stock Elmac, Gonset, Hallcrafters, Hammarlund, Johnson, Lyisco, Master Mobile, Morrow, National and other ham gear. H & H Electronic Supply, Inc. 506 Kishwaukee St., Rockford, Ill. WANTED: Mark II BC654 W2BXK.

SELL: Coast Guard receiver 15-650 Kc, new, prop-pitch motor, BC600 freq. motor, Command transmitter 7-9 Mc, pair new surplus 805 tubes. Reasonable. Want 20 meter Telrex beam. W8MAS.

WILL donate dead 852, 211, and porcelain base 210 to bona fide collector for \$1.00 postage. Willard Monahan, 817 Pacific, Manhattan Beach, Calif.

ELMAC Transmitter, \$135. Morrow complete mobile rcvr includes 6 volt supply, \$150. Never installed; used as fixed station for 2 mos. Orig. cartons and instrux books. W9MUB, 4100 W. Eddy, Chi., Ill.

W0CVU complete station for sale. Collins 32V3, 75A2A with factory installed mechanical filter, matching speaker, both 800 cycle and 3 Kc mechanical filters, 881 crystal calibrator, 148C-1NBFM adapter installed. Equipment like new condx and factory tested. Hardly used at all, \$1432 value for only \$995. Complete F.o.b. Cedar Rapids, Iowa. Write or wire Chas. W. Boegel, Jr., 1500 Center Point Road, NE, Cedar Rapids, Iowa.

SWAP: Bell & Howell 16 mm sound projector for ham gear, or test equipment. W7TWH, Sunburst, Montana.

SWAP: Near-new R9r plus 7 coils and power supply for VHF152A. Local deal preferred. Samkofsky, 264 Division Ave., Brooklyn 11, N. Y.

FOR Sale or trade: Precise 300 oscilloscope, in perfect condx. Want \$90, Collins 70E-8A or similar VFO, Panadapter or what have you? David Dillon, W8IRX, 1253 Fenimore St., Fairmont, W. Va. WOW, Will: Best offer over \$40 takes complete kilowatt power supply and free complete KW amplifier. Also Viking II and VFOlike new. Make offer. W6KPI, 2130 Williams, Palo Alto, Calif.

SELL: SP-600 JX10, BC-455, BC-457, BC-696. All in top condition. W2WFW, 255 Eastern Parkway, Brooklyn, N. Y. Tel: NE 8-5273.

FOR Sale: Collins 30-K transmitter, complete with exciter: \$1000, at Anthony, R. I. W1JND, Capwell, 474 Fairview Ave., Anthony, R. I.

WANTED: QST's 1920 and earlier. Top cash prices paid. A. F. Suenen, 3600 Forbes St., Pittsburgh 13, Penna.

SELL: AN/ARC-13 Driver, modulation transformer, pair of 811s, \$17; T-21/ARC-5, new \$10; Plate transformer 3600 volts, center-tapped, 450 Ma.; \$30; new pair RCA 832A's, \$15; tubes, capacitors, etc. Send for list. Seidman, W2GZN, 1535 Longfellow Ave., Bronx, N. Y.

FOR Sale: Complete mobile rig. Elmac rcvr and xmtrr, pwr supplies, etc. 33% off cost. Write for details. Box 206, Roxbury, N. Y.

GLOBE-KING, 400 watt pk; 450 c.w. Bud VFO, coils for all bands, extra pair TZ40s; BC342 rcvr, complete, \$395. F.o.b. Martinsville, Va., Webb, W4AAH, 103 Erwin St., Villa Hgts, Martinsville, Va.

SELLING: Transmitting equipment with gray Bud panels; heavy duty power supply, 750 volts, 300 Ma. plus bias, \$50; 500-watt antenna tuner, \$25; new parts for 350-watt final amplifier and variable voltage filament power supply, 106 for photos and details plus list of mobile gear, test equipment, tubes and parts. Gray Bud cabinet, CR-1772, \$35. Roy Gillett, W2PNG, 68 Hyde Boulevard, Ballston Spa, N. Y.

SOUTHEASTERN Hams! For a good deal in ham gear try Curle Radio Supply, 404 Meridan, Huntsville, Alabama, 439 Broad Street, Chattanooga, Tennessee.

SELL: R23/ARC 5, Q5'er unmodified, new w/dynamotor, \$20; BC348Q coil assemblies, new, RF #191, Det. #192, \$3 ea; PE101C, new, modified #3395; DM32A, \$14 each; BC605 coil set, \$2.50; QST's 1937-1948, \$2 per yr. all plus shipping. Have cash for good receiver. M. J. Marshall, 455 Washington Ave., Dumont, N. J.

SELL: 450TH tubes, \$17.50 each, or two for \$30. Complete power supply 1000 VDC at 500 Ma. or 2000 VDC at 300 Ma., plus filament and relay voltages, \$48. Beautiful Federal commercial radio telephone transmitter, full kilowatt plus. In three slim six-ft. cabinets, power supply, modulator and RF units, uses 450TH modulator and output tubes. Original cost about \$7000. Asking \$595 or trade for 450TH A3, All F.o.b. W7DI, Cheyenne, Wyoming. Box 2098, Cheyenne, Wyoming. Call B. Hempel, W7DI.

FOR Sale: SX28A relay rack style receiver, less speaker. First check cash, or money order for \$90 (takes 10 Will pack and ship. W8FSA, c/o Itasca Radio Sales & Service, Itasca, Michigan.

GOING Mobile or High Frequency? A complete Gonset outfit for sale for cash. Deluxe two meter Communicator II (squelch), Super-Six Converter, Super-Ceiver, Gonset Commander transmitter and V.F.O. All in a "like-new" condition. Take one, take all. W1KJT, R. T. Graham, P.O. Box 23, Stoneham, Mass. Tel. ST 6-1966.

HISTORICI! "The Story of the First Trans-Atlantic Short Wave Message" is illustrated with photographs, diagrams, reproductions of logs, news stories, magazine articles. Send \$1 to The Radio Club of America, 11 West 42nd St., New York City 36 and ask for the 1BCG Issue of the Proceedings.

LOS ANGELES Hams! For sale: 1 K.W. linear amplifier, AM, FM, SSB, etc., only \$100. Only \$1000 10 watts drive. \$600. Terms. Mr. W. P. Quinn, Dunkirk 3-5054.

FOR Sale: Lyisco 600 transmitter, with 401 modulator, 9W2, 1250 volt 300 Ma. power supply, \$20. Want: NC100 with PW dial. J. Phipps, W2CQP, Box 1004, Sparta, N. J. Lake Mohawk 8203.

WANTED: Plate transformer for FRC-1 3600V CT, 200 Ma. Sell BC221AC with chart, excellent; SCR522, complete, brand new, never used. Best offer. W6FDG, Clark, 40 Ardmore Road, Berkeley 7, Calif.

WANTED: Good National, Collins, Hammarlund or Hallcrafters receiver, Matchbox, W6KDR, Stidham, 904 N. Dickel, Anaheim, Calif.

MUST sell complete mobile and fixed station including Gon-Set Iriband, Hallcrafters SX24, two transmitters, power supplies, etc. Write for complete list of equipment and prices. Albert E. Linden, W3KY1, 306 Dogwood Drive, Levittown, Penna.

SSB20A, never used: \$210. Howard Dunlap, Box E, Beverly Farms, Mass.

VIKING II, like new, factory-wired: \$265. W2CFT, Box 483, Lake Ronkonkoma, L. I., N. Y.

RECORDISTS! Exchange talking and musical tapes internationally! Box 1404-B, San Francisco 1, Calif.

SELL: Heathkit AR-2 com. revr, gud condx, with cabinet; prefer local sale: \$25. Jerry, K2HNF, 579-84 St., Brooklyn, N. Y.

HY-LITE 3-el. 15 over 20 meter beam. Original carton. Never used. Small prop pitch motor completely converted, transformer, 2 selsyns, \$125. Original cost, \$163. Niagara low pass filter, \$5. Plate filament transformers, double-single button carbon microphones, tubes, relays, crystals, meters. Write for list. W2EQS, O'Brien, 48 Prospect Ave., Westwood, N. J.

SELL: B & W Baldurs (for 32V and Viking). New Dow-Key coax relay. Melvin Gardner 134 S. Ferry, Ottumwa, Iowa.

SELL: New BC654A xmtrr/rcvr with all tubes, PE104 power pack T17 mike, key, no conversions, \$50, with PE103, \$65, complete portable diathermy, good operating condx, \$25. Oliver F. Nash, 134 Ashman Circle, Midland, Michigan.

SELL: NC173 and speaker, in excellent condx, \$110; Harvey-Wells TBS50 DeLux, with companion power supply, and VFO, in like-new condx, \$140. Harvey-Wells dynamotor 6V input 350V, 250 Ma. output. New, never used. Best cash offer. Ed Edwards, 7067 No. Ashland Blvd., Chicago 26, Ill. Ho. 5-7198.

SELL modern TVI-proofed 65-watt transmitter, 25 watt modulator, power supplies, antenna coils, etc. Constructed as per February 1952 QST. First \$100 takes all. Send for details. Don Franzmann, W9NFJ, 647 Ripley Ave., Eau Claire, Wis.

SELL: Viking II, Viking VFO, Matchbox, Hallcrafters SX-88 with speaker, B&W low pass, D 104 mike Vibroplex Bug, Heathkit grid dipper, Miller Bridge, Baluns, Relays, 500 watt coils, antennas, coax, etc. Beautiful condition and functionally perfect. All sincere offers or inquiries welcomed and acknowledged. Gordon Crowe, W0JPG, 303 Brush Creek, Kansas City, Mo. Phone L 0gan 2426.

SELL: QST January 1928 thru December 1954, in excellent condition. \$75.00. Fred Conr, Neoga, Ill.

FOR Sale: Elmac PMR-6A mobile receiver; also PMR-6 and PMR-116 power supply. David Lauer, 1317 Blaine Blvd., Racine, Wis.

SELL/Swap: One complete mobile station. Elmac AF67 xmtrr, Morrow 5BR converter with S/W Mobile-Ceiver modified with outboard FNS, 8 ft. whip with Johnson whip-load 6 coil, extra strong base and heavy coil spring. Carter Gen-E-Motor 500w, at 200 Ma.; Leece-Neville AC generator with mountings for Ford 6, complete, chest mike, bug, all instruction books; Triplet 3256 absorption freq. meter. Cost over \$500. Want \$250 cash or excellent SP400 Super Pro or Collins 75A1. Andy Sallet, P.O. Box 103 Seward, Ill. F.o.b. Seward, Illinois

SELL: Fifty lesson CREI radio course, \$50 or trade for rcvr or xmtrr. Warren Jarvis, W4SCY 139-28 230th Place, Laurelton, N. Y.

SELL: High-voltage dc generator 1060 volts, 425 amps: \$15. W4OFP, SX-71 Like-new condx, used 50 hours: \$175.00. Harold Greene, W1KO, West Hanover, Mass.

MEDICAL Hams! Trade Raytheon portable microtherm in new condx; want 75A3 in same condx. C. R. Faulkner, K4AXE, 106 No. Main, Somerset, Ky.

FOR Sale: XYL needs room! Collins 310B, all coils, like new. TVI suppressed, \$200; BC459, new, \$24.95; BC455, new, \$16.95; Mobile Equipment: TBS50 Sr. \$75; Gonset Triband Converter, \$30; BD77 generator with 6V relay, \$25; complete Master Mobile ant. with 20 meter coil and 6 volt co-ax antenna changeover relay, \$15 Or \$125 for all mobile equipment. Many other items! Send for list! Mike Rosenberg, W2FNF, 35 Strawberry Lane, Roslyn Heights, L. I., N. Y.

COLLINS 32V1, in excellent condx, \$350. National HFS and pwr supply, \$90. Prices F.o.b. Glenside, Pa. Krewson, W3OQI, P.O. Box 175, Glenside, Pa.

QSTs: 280 issues — 1922-1950, \$100, with covers. Stamp for list. Bud Gentry, W6WIM, 428 Maple, Richardson, Texas.

FOR Sale: AR-88-D rcvr with manuals, best offer, new BC625A 1000 watt tubes, in carton, \$17.50; two Miller R-9ers each with two coils, \$18.00 each; Miller high voltage power supply type 90281 with manual, \$75 or best offer. All replies answered. All F.o.b. Ipswich, Mass. Write to W1TKC, P.O. Box 232, Ipswich, Mass.

COLLINS 32V3 xmtrr, like new, \$590; National NC-183 rcvr with spkr, in gud condx, \$175; Instructograph with 11 tapes, less oscillator, \$20; PE103 dynamotor, like new, with spare brushes, \$25. Don DeShazo, Jr., W9BVC, 529 Blackstone Ave., LaGrange, Ill.

ALUMINUM reflecting callsign. Regular, \$1.50; Jumbo, \$2.00, lawn stake sign, \$2.50. Day service. Whitley, W2LPG, 133 Airdale Ave., Long Branch, N. J.

BC-342 receiver, A-1 condition, \$90. W1CEG, 183 Daly Ave., New Britain, Conn.

SELL: Collins kilowatt modulation transformer, conservatively rated, \$40, W6WZD.

SELL: Viking II and VFO, like new, factory-wired, \$325 or best offer. Reason for selling: Going SSB! W0TGC, Muholand, 1656 Liggett Ct., St. Louis 19, Mo.

SELL: Collins 32V1, \$375; HRO-60R, \$425; Collins 30-1 with 310-C exciter, \$475; Bechm, automatic key with 3-4 tape perforator for Morse code, \$145; TS-34, \$145; Dumont #241, \$275; APN-9 with inverter, \$225; 1-208 sig. gen., \$150; Want: BC-610, ARN-7, ARC-1, TS-173, TS-174, TS-175, BC-614, Collins 75A, 32V, Tech. manuals and supply catalogs. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. Richmond 2-0916.

FOR Sale: 1 new 2C43 tube, 2 new 2C39A tubes, 1 used 5G 60-cycle selsyn. Best offer to Genaille, W5RSN, 2122 E. Monroe Ave., Harlingen, Texas.

PASS amateur theory exams. Check yourself with sample FCC-type questions and Novice and General Class examinations. All for only \$04. Ameco Electronics, 1203 Bryant Ave., New York 59, N. Y.

FOR Sale: Modified Hy-Lite 20-meter beam; 3-elements; spaced .15 director, 2 reflector, "Y" match, 50 pounds. Will crate and ship collect. Photographs on request. K2IXC, Fairchild, 23 Woodridge Lane, Sea Cliff, N. Y.

COMING Soon! 75-watt 160-10 handswitching CW transmitter. Kit: \$59.95, Wired: \$69.95, 25-watt kit, \$19.95. Details free. Hart Industries, 467 Park, Birmingham, Mich.

SELL: Collins 32V3, \$575. Cash and carry. W4KNW, 742 So. 78th St., Birmingham, Ala.



MOBILE transmitter 80-40 M. xtal with Carter dynamotor, 400v. at 300 Ma. ATR inverter RSB input 6v. output 110 AC; 85 w. intermittent, \$12.00 F.O.B. San Antonio 9, Texas. Johnston, Box 6703.

ANTENNA Wire #18 high strength Copperweld 1000 ft., \$4.60; 2500 ft., \$9.75 postage paid. R. J. Buchan Co., P.O. Box 9, Bricelyn, Minn.

SELL: Elmac AF-67, 600 volt pwr supply, PMR 6-A w/pwr supply, Shure 505-C mike, Advance Elec. coax relay, speaker, all brackets, cables, manuals, etc. Excellent condx; \$285. Allan Murphey, W4JAG, Princeton, Kentucky.

A Stancord 10-meter xmitter, 3Br narrow conv., Western Electric dyn., 5.8 v. in 425 v. 375 Ma. outp. All for \$75.00. Jeff Taylor, W9BRH, 714 N. Lockwood Ave., Chi. 44, Ill.

WANT Tape-Recorder, Write for list of gear offered in trade. VESMS, LaFleche, Sask., Can.

FOR Sale: Hallicrafters SX-71 with matching speaker, in gud condx; \$140. W4ESD, 29 Morton St., Aiken, S. C.

FOR Sale: Eldico Universal antenna coupler; shielded cabinet for TBS-50; Wanted: G.D.O.; frequency meter; Pr. 4-250A; Pr. 810, power supply capable of output 2500 v. @ 400 Ma. W9PWW, 83 W. Waukegan Rd., Lake Forest, Ill.

SELL: NC-200 receiver, \$100 f.o.b. Reason: drafted. W4UKO, 1001 Sedgefield Rd., Charlotte, N. C.

COLLINS 32V-3 with spare 4D32, in original carton, with manual. Spotless and guaranteed like new. Used very little. First check for \$595 takes it. Herb Green, W9ARI, 1227 West 17th St., Muncie, Ind.

FOR Sale: BC-610 transmitter. Factory converted for ten meters. Like new condx. New modulation transformer all new plastic condensers in speech equipment. Complete with BC614 speech amplifier, technical manuals and cables and ant. relay. Spare modulation deck spare 250TH and 100TH, \$450. Francis L. Sutton, 1018 Club Drive, Johnstown, Penna.

SELL IRE Proceedings 1950 through 1954 with directories, \$15 per year. ARCA, 825 E. 6th St., Ft. Lauderdale, Fla., W4CGS, 3102 SW 15th Ct., Ft. Lauderdale, Fla.

FOR Sale or trade: LS-84, CG-301, CG-104, PA-429, PA-109, all UTC. Rack mounted amplifier, 6V6's into LS-52, push-pull. Freed, 13600. Two 203A plus sockets. Will trade for good stamps. All replies answered. A. R. Ronzio, 1250 41st St., Los Alamos, N. Mexico.

LYSCO Model 600 transmitter, in gud condx, \$75. Roy Scherman, W9FHS, 4640 No. Kasson Ave., Chicago 30, Ill.

NOW! Power your surplus recvrs and transmitters from 115VAC line "Tabtron" B28V/5A for AKC5, BC312, 342, 348 at \$15; "Tabtron" B28V/24A for BC634 or BC375 at \$110; "Tabtron" B12V/50A for BC191 at \$110. "TAB", 111 Liberty St., N. Y. 6, N. Y.

HALLICRAFTERS HT20 AM-CW transmitter, used less than five hours. Prefer pickup here. Will sacrifice at \$300. Also Thordarson 11M77 multimatch 300 watt xmitter, \$20. W9GXB, Mitchell Wiseman, 5157 Clarendon Rd., Indianapolis, Ind. BR 9429.

OLDE Rex: Please call, write or wire Olde Rex first for an excellent proposition in all new and used ham gear, National HiFi, and Winchester portable lighting and generating equipment. Consulting and installation specialist amateur mobile equipment featuring Harvey-Wells (T-90 and R-9) and Elmac (PMR6A and AF-67 gear). Visitors welcome evenings and weekends to Electronic Heights, Home of New England's only 6-element 20-meter Telrex. Olde Rex, Electronic Heights, 5 Retrop Road, Natick, Mass. Tel. Olympic 3-2130.

SALE: Hammarlund HQ-140 X receiver. New condition: \$230. Henry H. Harris, Jr. P.O. Box 1187, Charlottesville, Va.

CLEANING House: Power supply parts, transmitting variable condensers, miscellaneous amateur transmitting and receiving parts and tubes. Stamp for list. W8CBS, 743 Erie Avenue, Chillicothe, Ohio.

SELL: ART-13 Sp. amp. new w/tubes, \$15. Motorola dual Vibrator sup. 340v., 240 Ma., \$15; Master Mobile Mount 132XC, \$7; Master Mobile Ant. with 75 and 20 M coils, \$5; converter 75 M, \$10; Auto xfrmr 110V. 600 Va., \$6; dynamotor 5.8V, 425V, 375 Ma., \$10. Carbon mike taxicab type retractable cord, \$5; dynamotor start relays same as in PE1013 6V, \$1.50 postpaid. Write for details. A. Brocato, 1334 Brown Marx Bldg., Birmingham, Ala.

RECEIVER wanted with xtal filter, noise-limiter, and S meter: \$100 maximum. P. H. Silbert, 44 Seaview Ave., Marblehead, Mass.

MO Hams or others, if between age twenty and thirty-two, high school graduate, some typing ability, copy code twenty WPM, and interested in permanent position in police communications write: Director, Radio Division, Missouri Highway Patrol, Jefferson City, Missouri.

QST: Need February 1920. Pay your price. Also govt. call books 1923-25 and Wm. B. Duck catalog. W5NW, Box 586, Odessa, Texas.

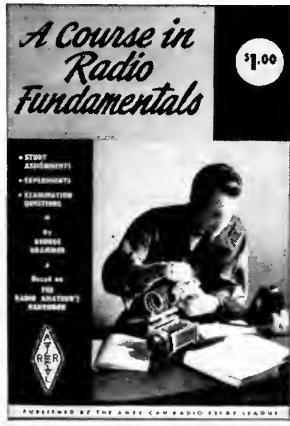
2-METER Beams; 6 element, horizontal or vertical, all seamless aluminum. \$6.95 prepaid. Wholesale Supply Co., Lunenburg, Mass.

SELL VHF transmitter using Millen 90810 RF unit, 1625s Class B modulators with S-9 driver, three power supplies, in 30-in. relay rack. Photos available, several spare 829Bs, three AX3 crystals, coils for 2, 6 and 10. BC-634A with PE-104, various Command transmitters and receivers. Dismantling 500 watt AM transmitter, all parts for sale. Send for list. W9GWL.

FOR Sale: Gonset 2-meter converter, \$28; McMurdo-Silver 2-meter xmitter including crystal, \$30; both in brand new condx; RCA 45 RPM with ampl. in portable case, new crystal, \$18. Wanted: National One Ten, also Gonset Communicator. H. I. Griffiths, W2OQR, 39-82 65 Place, Woodside 77, L. I., N. Y.

FOR Sale: BC610-E transmitter de-TV'd, with 614-E speech amplifier, 2 spare 250THs, 4 spare 100THs, coax antenna relay, all for \$550 F.O.B. Denton, Texas. Will deliver within 100 miles. Also SX-43 receiver with R24 speaker, both \$99.50. Call or write W5CC, H. V. Shepard, phone Central 4144. Write P. O. Box 669, Denton, Texas.

SELL: R-4/ARR-2 receiver, 11-tube, UHF for operation on 1 1/4 meter band. With tubes, schematic, less dyn., \$7.95 MD-7 Modulator, provides plate and screen mod. for any xmitter of the AN/ARR-5 equipment. With 4 tubes. In excellent condx; \$7.95; MP-28 modulator only for power supply, TA-12 xmitter. In new condx, with dynamotor, \$14.95. ID6A/APN4 indicator 'scope, in gud condx. With 27 tubes, xtal and schematic, \$19.95. C. J. Casey, 7460 Varna Ave., N. Hollywood, Calif.



A concise, clearly written text for use with the Radio Amateur's Handbook, A Course in Radio Fundamentals is ideal for the beginner but just as useful for the more advanced amateur who wants to brush up on his radio knowledge. For radio theory classes it is one of the most practical books available.

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90801

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The No. 90801 Exciter-Transmitter is of the most modern design including features and shielding for TVI reduction, band-switching for the 4-7-14-21 and 28 megacycle bands, circuit metering. Conservatively rated for use either as a transmitter or exciter. 5763 oscillator-buffer-multiplier and 6146 power amplifier. 90 watts input for CW. Can be keyed in the oscillator and/or amplifier or by means of keyed external V.F.O. such as the 90711. 67 watts input phone. Rack mounted 3½" panel height.

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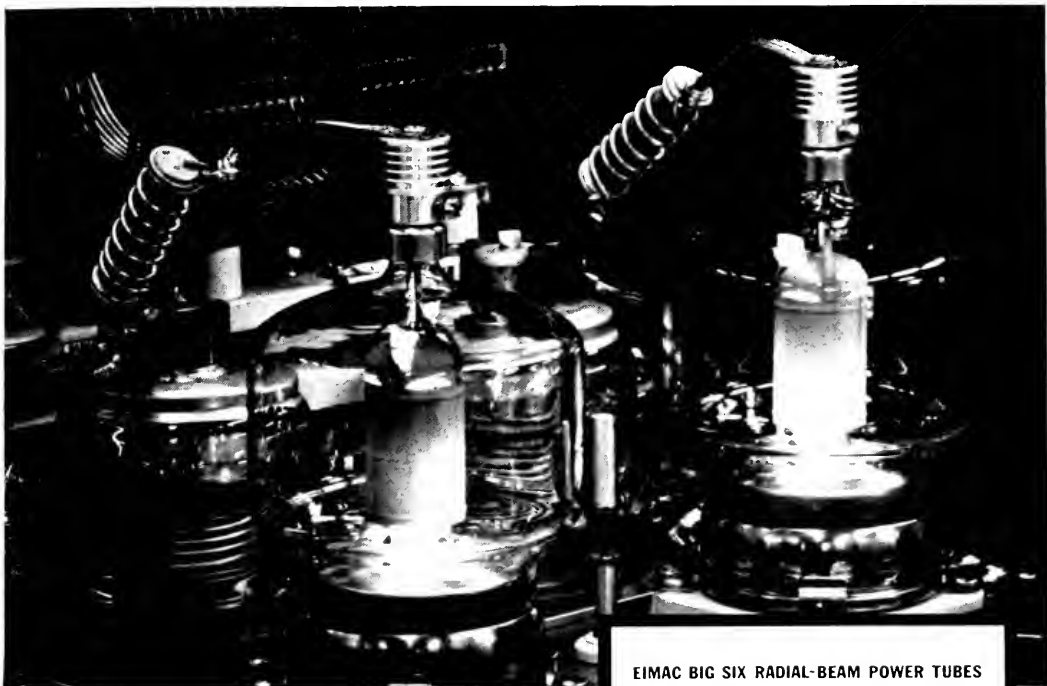
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# How to select a tube for single sideband



To realize the advantages of Single Sideband operation, there are two important points to keep in mind when selecting a final amplifier tube. First, since there is no continuously running carrier, high peak powers may be reached when a signal is put on the air. And second, because it is easier to produce an SSB signal at a low power level, it takes more than an ordinary tube to build this valuable low power signal from the modulator to high power in a single amplifier stage. Eimac tubes offer these extras. Their reserve supply of filament emission, lack of internal insulators and widely recognized ability to handle high peak power has been proved over the years. And high power gain is inherent in all Eimac multi-grid tubes. When planning or building an SSB rig, remember these two important points and consider the Big Six of Amateur Radio—Eimac 4-65A, 4-125A, 4-250A, 4-400A and 4X150A radial-beam power tetrodes and the 4E27A radial-beam power pentode.

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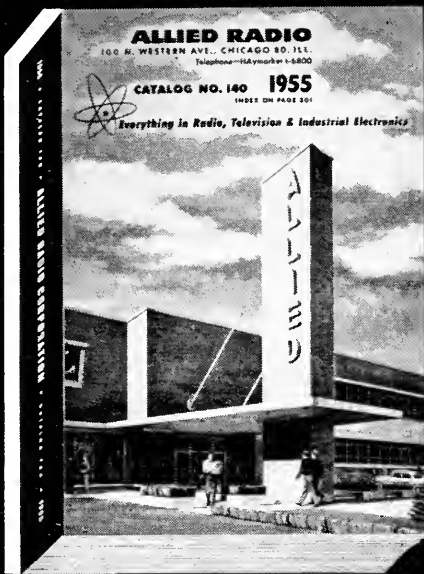
	DC Plate Voltage	DC Screen Voltage	Peak Sig RF Grid Driving Voltage	Peak Sig Plate Power Input
4-65A	2000	450	100	195
4-125A	2500	555	100	300
4-250A	3000	600	110	630
4-400A	3000	810	140	900
4X150A	1250	375	60	350
4E27A	2500	600	110	325

\*Permitting safe adjustment and conservative operation.

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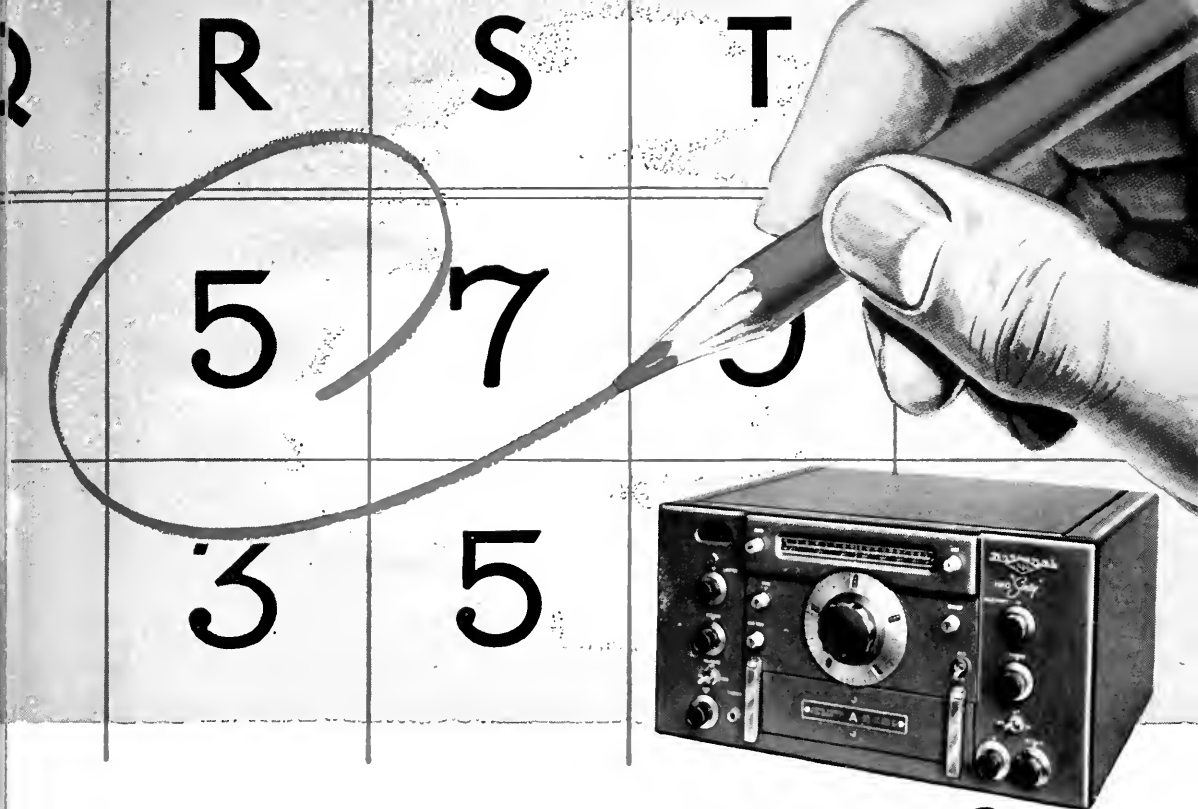
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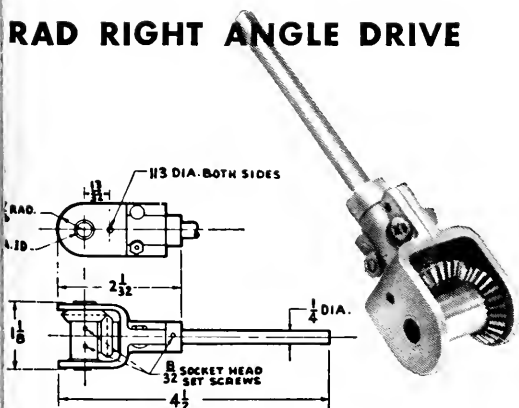
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For example, look at the final amplifier of Johnson's Viking II. Two RCA-6146 beam power tubes in parallel deliver a signal wallop that is making history in the amateur bands.

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Preferred by radio amateurs—and by commercial transmitter designers—RCA high-perveance beam power tubes and triodes are available in a wide choice of input ratings. Your RCA Tube Distributor handles the entire line. For tube technical data, write RCA, Commercial Engineering, Section C37M Harrison, New Jersey.

Close-up view of the RCA-6146's in parallel — in the final amplifier of the Johnson Viking II.



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HARRISON, N. J.

**QST**



April 1955  
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G - Generator  
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As it is the plan to publish a new edition of the book in the fall, it will be taken into consideration.

In This Issue—  
**THE  
NEW LOOK  
IN SCHEMATIC  
SYMBOLS**



Air Core Iron Core Adjustable Inductance - Coupling  
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OUR MILLIONTH FILTER SHIPPED THIS YEAR...

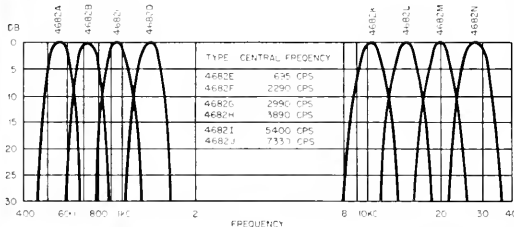
# FILTERS

## FOR EVERY APPLICATION

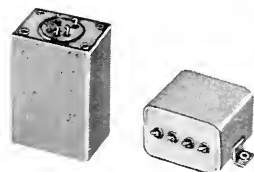


### TELEMETERING FILTERS

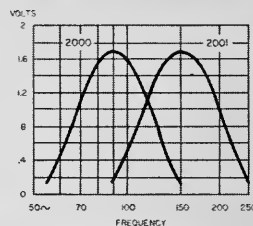
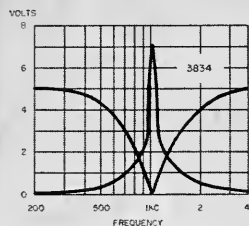
UTC manufactures a wide variety of band pass filters for multi-channel telemetering. Illustrated are a group of filters supplied for 400 cycle to 40 KC service. Miniaturized units have been made for many applications. For example a group of 4 cubic inch units which provide 50 channels between 4 KC and 100 KC



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(4682A) 1½ x 2 x 4".



Dimensions:  
(3834) 1¼ x 1¾ x 2-3/16".  
(2000, 1) 1¼ x 1¾ x 1¾".



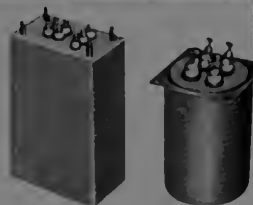
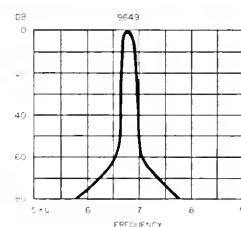
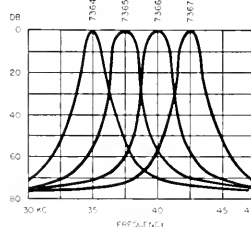
### AIRCRAFT FILTERS

UTC has produced the bulk of filters used in aircraft equipment for over a decade. The curve at the left is that of a miniaturized (1020 cycles) range filter providing high attenuation between voice and range frequencies.

Curves at the right are that of our miniaturized 90 and 150 cycle filters for glide path systems.

### CARRIER FILTERS

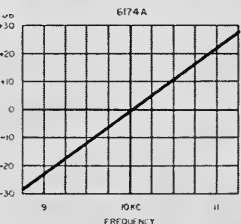
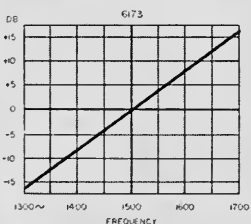
A wide variety of carrier filters are available for specific applications. This type of tone channel filter can be supplied in a varied range of band widths and attenuations. The curves shown are typical units.



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(7364 series) 1½ x 1¾ x 2¼".  
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General Electric congratulates the winner of the 1954 Edison Award, Benjamin S. Hamilton, W6VFT, La Mesa, California. The judges named Mr. Hamilton as the amateur whose achievement was most noteworthy, because he provided San Diego County, California, with "an outstanding Civil Defense and disaster-emergency radio network". Recognition given to Award-winner W6VFT and to others whom the judges cited, was equally a tribute to the public-spirited efforts of radio amateurs everywhere.

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KWS-1 Transmitter

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# QST

APRIL 1955

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East Bay	W6RLB	Guy Black	1546 Spruce St.
San Francisco	W6GGC	Walter A. Buckley	36 Colonial Way
Sacramento Valley	W6JDN	Harold L. Lucero	1113 Elinore Ave.
San Joaquin Valley	W6GIW	Edward L. Bewley	421 East Olive St.
<b>ROANOKE DIVISION</b>			
North Carolina	W4WXZ	Charles H. Brydges	3246 Sunset Drive
South Carolina	W4ANK	T. Hunter Wood	1702 North Rhett Ave.
Virginia	W4KX	John Carl Morgan	c/o Radio Station WFVA
West Virginia	W8FQQ	Albert H. Hix	1013 Belmont St.
<b>ROCKY MOUNTAIN DIVISION</b>			
Colorado	W0CDX	Karl Brueggeman	1945 Kearny St.
Utah	W7UTM	Floyd L. Hinshaw	165 East 4th, North
Wyoming	W7PKX	Wallace J. Ritter	P.O. Box 797
<b>SOUTHEASTERN DIVISION</b>			
Alabama	W4MI	Joe A. Shannon	
Eastern Florida	W4FWZ	John W. Hollister	3809 Springfield Blvd.
Western Florida	W4MS	Edward J. Collins	1003 E. Blount St.
Georgia	W4NS	George W. Parker	226 Kings Highway
West Indies (Cuba-P.R.-V.I.)	KP4DJ	William Werner	563 Ramon Llovet
Canal Zone	KZ5RM	Roger M. Howe	Box 462
<b>SOUTHWESTERN DIVISION</b>			
Los Angeles	W6YVJ	Howard C. Bellman	973 Mayo St.
Arizona	W7LVR	Albert Steinbrecher	RFD 5, Box 800
San Diego	W6LRU	Don Stansifer	3427 Pescadero
Santa Barbara	W6QIW	William B. Farwell	96 Grapevine Road
<b>WEST GULF DIVISION</b>			
Northern Texas	W5JOD	T. Bruce Craig	1706-27th
Oklahoma	W5RST	Dr. Will G. Crandall	State Veterans Hospital
Southern Texas	W5QDX	Morley Bartholomew	RFD 7, Box 65
New Mexico	W5ZU	G. Merton Sayre	Box 625
<b>CANADIAN DIVISION</b>			
Maritime	VE1QM	Douglas C. Johnson	1041 Preston St.
Ontario	VE3IA	G. Eric Farquhar	16 Emerald Crescent
Quebec	VE2GL	Gordon A. Lynn	R.R. No. 1
Alberta	VE6MJ	Sydney T. Jones	10706-57th Ave.
British Columbia	VE7JT	Peter M. McIntyre	981 West 26th Ave.
Yukon			
Manitoba	VE4HL	John Polmark	109-13th, N.W.
Saskatchewan	VE5HR	Harold R. Horn	1044 King St.
			Gilbertsville
			Baltimore 7, Md.
			Palmyra
			Tonawanda
			Sharpsville
			Oak Park
			Fort Wayne 6
			Wausau
			Drayton
			Sioux Falls
			Minneapolis 7
			Springtown
			New Orleans 20
			Greenville
			Memphis
			Williamson, W. Va.
			Buchanan
			Cleveland 26
			Troy
			East Hampton, L. I.
			Asbury Park
			Mitchellville
			Topeka
			Ferguson 21
			North Platte
			Southington
			Wiscasset
			North Quincy 71
			Easthampton
			Concord
			Providence 6
			Newport
			Anchorage
			Boise
			Billings
			Portland
			Seattle 5
			Honolulu
			Boulder City
			San Jose
			Berkeley 8
			San Francisco
			Dunsmuir
			Turlock
			Charlotte
			North Charleston
			Fredericksburg
			Forest Hills, Charleston 4
			Denver
			Bountiful
			Sheridan
			Cottondale
			Jacksonville
			Pensacola
			Decatur
			Urb. Truman,
			Rio Piedras, P. R.
			Balboa Heights, C. Z.
			Los Angeles 42
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			San Diego 7
			Oak View
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# THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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# "It Seems to Us..."

## MOBILE SIGNING

The receipt of several inquiries on the subject prompts us to discuss some aspects of signing procedures when operating mobile in aircraft or on board ship. Apparently many amateurs assume that *any* station aboard an aircraft is "aeronautical mobile," and any station aboard a vessel is "maritime mobile." Not so, at least as far as amateur call sign identification procedures are concerned.

When operating in one of the ten FCC districts — that is, within the continental limits of the United States — an amateur mobile station in an aircraft or on board ship signs its call in precisely the same manner as any other amateur mobile station such as one in an automobile. For example, a station in an aircraft flying over Wisconsin would sign, on c.w., "de W3XXX 9." On 'phone, it would identify itself as "This is W3XXX mobile over Madison, Wisconsin." An amateur station aboard a boat in New York Harbor would sign ", 2" or "mobile in New York Harbor."

Only amateur stations operating outside the continental limits of the United States use the terms "aeronautical mobile" and "maritime mobile" as part of the required call sign identification. It follows that such terms should be encountered only in the 21- and 28-Mc. bands, such being the maximum permitted U. S. amateurs outside our country. Example: An amateur station on an aircraft en route to Europe would sign, on c.w., "de W3XXX AM." At the end of the contact, it would also indicate the number of the aircraft and the approximate geographical location, e.g., "de W3XXX AM NC41752 3000 MI E OF NEW YORK NY." On board ship on the high seas, the c.w. sign would be "de W3XXX MM," or at the end of the contact: "de W3XXX MM SS FLYING GULL 40 W 45 N." On 'phone, the same data would be conveyed in the signature.

The point of all this is, however, that amateur mobile stations within the continental limits of the U. S. sign in exactly the same manner whether they are being operated from an automobile, aircraft, a small boat, ocean liner, or a bicycle.

## BEST SELLERS

Even in these days of billions and trillions, a little ol' million is still a pretty substantial figure. It is especially so when one is speaking not of Government moneys, but of publication sales. And it becomes a strikingly large figure when it represents the sale of a pamphlet in a field as comparatively limited as amateur radio.

Yet *The Radio Amateur's License Manual* has just sold its millionth copy. *How to Become a Radio Amateur* has topped the half-million mark, and *Learning the Radiotelegraph Code* — the third and newest in the "Gateway to Amateur Radio" series ARRL has available for newcomers — is almost to the quarter-million mark. *The ARRL Antenna Book* is well over a quarter-million; *A Course in Radio Fundamentals* is pushing 200,000 with *Hints & Kinks* not far behind. Any way you look at it, these League publications have earned the title of "best sellers."

Time was when *QST* was the only League publication. In 1926, the first *Handbook* appeared; as its sales now approach the 3,000,000 mark we can laugh at our concern — although it was a deadly serious problem at the time — whether the initial printing of 5,000 copies could ever be sold before the text became obsolete!

But that's another story. In late 1929 the League decided, as one means to increase its membership, to promote interest in amateur radio on the part of potential newcomers. So Hq. got up a little pamphlet briefly outlining what amateur radio had to offer as a hobby, giving constructional details on a 160-meter two-tube (201As) regenerative detector and one-stage audio receiver and a UX 210 t.n.t. transmitter of about thirty watts, and some brief dope on how to learn the code and get licenses. It was given the title *How to Become a Radio Amateur* and thus — just twenty-five years ago — became the first ARRL booklet. Intended strictly as a promotional piece, it was nominally priced at a dime, which went mostly for postage and handling. Distributed through newsstands and from advertising in



Normally pretty cheerful guys anyway, General Manager A. L. Budlong and Circulation Manager David H. Houghton have good reason for these wide grins — the millionth copy of ARRL's *License Manual*.

boys' and home mechanic magazines, it enjoyed an immediate success.

So much so, in fact, that a couple of years later a new edition was brought out with somewhat more elaborate treatment. At about the same time, in response to a growing demand, the League produced a 20-page compilation of licensing information and some questions-and-answers for the amateur exam — which of course became the *License Manual*. A *QST* editorial of the date (1933) announced their appearances this way:

In addition to *QST* and the *Handbook* the League has produced this year a couple of booklets which we believe will be found most instructive and valuable. We intend before the year is out to produce a few more in a series which is now getting sufficiently extensive to be called a "Radio Amateur's Library." One of the important functions of ARRL is to make absolutely-reliable information available to its members at nominal cost. In preparing these booklets it will be our policy to select subjects upon which further light is badly needed, to give them complete treatment to an extent impossible in the pages of *QST* or the *Handbook*, and to sell them at nominal prices.

How could we put it any better today?

## OUR COVER

Yes — they're different! Here are the symbols that will appear in *QST* starting with this issue. The objective is to standardize, modernize, and simplify circuit symbolization. The American Standard symbols shown required five years of preparation. Those participating in this task included representatives of industry, government, and publishing.

For a detailed explanation, turn to "Graphical Symbols for Radio Diagrams," by Harold P. Westman, Technical Editor of *QST* in the late Twenties. The article begins on page 16.

## Strays

W9DYZ reports considerable interest in the formation of an association by electronic reps who are hams. He plans to have the first meeting at the Conrad Hilton during the May Parts Show and all "Hamreps" are invited to attend. For details write to John A. Benz, W9DYZ, 4809 West Fond du Lac Ave., Milwaukee 16, Wisconsin.

W9ARH recently received a QSL from W5BAQ. Nothing unusual except that the card was for a QSO held 23½ years ago!

The fog surrounding the origin of the variable bandwidth filter system described by Cmdr. H. E. Thomas, W6CAB, in February *QST*, page 17, has been lifted. Dana Griffin, W2AOE — who incidentally has authored a considerable number of thought-provoking articles in *QST* over the years — holds a patent (No. 2,354,749, issued August 1, 1944) on the system and described it publicly in a paper presented before the Radio Club of America in 1946.

An article entitled "An Amazing New Hobby: Ham Radio for the Whole Family" appeared in the February issue of *Parents'* magazine. The author, Walker A. Tompkins, K6ATX, presents a lively description of amateur radio and also some good hints for prospective hams.

An advantage of the screen protective circuit not mentioned in "A Protective Circuit for Transmitting Tetrodes," by Beling (*QST* for October '54, beginning on page 33) is that in the event of an open heater in the dual triode, the current path through the screen voltage dropping section would be open, thereby protecting the r.f. amplifier tube. — WSELJ

## ROANOKE ELECTION RESULT

Theodore P. Mathewson, W4FJ, has been elected Vice-Director of the Roanoke Division, receiving 522 votes to 434 for Thomas H. Wood, W4ANK, in the special election tallied on February 21st. Licensed since 1921, OM Mathewson is a past President of the Richmond Amateur Radio Club, an OO, and a member of the A-1 Operator Club. He is a life insurance underwriter in Richmond, Virginia.

## FLASH!

The Federal Communications Commission has acted to open the 50-Mc. band to Technician Class licensees effective April 12th. In the same action the Commission decided against opening the 144-Mc. band to Technicians.

# The All-Electronic "Ultimatic" Keyer

## Part I — Construction and Handling

BY JOHN KAYE,\* W6SRV

THE SELECTION two years ago of "Ultimatic" as a name for "a key with a memory" was a bit premature.<sup>1</sup> Reversion to the hoary twin-lever key and the addition of sequence "seizure" now eliminates most of the back-and-forth motion normally associated with code transmission, carrying the principle much closer to the ultimate.

The new sequencing function provides leeway for key release corresponding to, and greatly exceeding in time, the leeway for key closure provided by advance storage in the memory circuits. It also reduces the maximum back-and-forth motion of the hand to *once per letter*, and that at a greatly reduced rate. On most letters the rocking motion is completely eliminated. By obviating the fight against the hand's inertia, the effort expended for any given speed is greatly reduced. Besides relieving the operator of virtually all timing responsibilities, and most of the labor, the compound leeway does away with all sensation of being chained to an inexorable time base.

The time base, memory, and interlocked-sequencer circuits handle automatic spacing and advance storage of marking characters in a manner functionally identical to the relay model. (The original article is recommended rereading in conjunction with a detailed study of this improved model.) With twin keys and the new seizure circuitry, continuous closure of one key generates that type of character until the opposite key is also closed. After completion of the character in progress, the output switches to the opposite type, even with both keys closed. Release of either key provides output corresponding to the still-closed key. With one key held closed, a single opposite-type character can be injected by a closure (as short as 2 microseconds) of the opposite key at any time after the start of a desired preceding character.

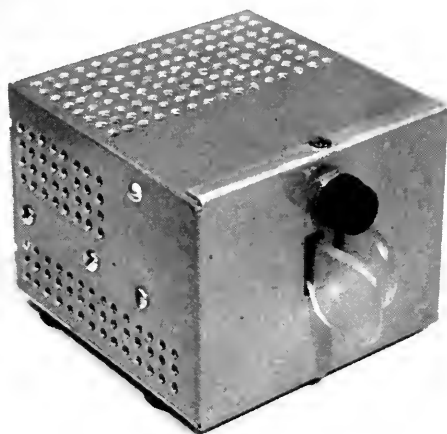
Multiple intermediary opposite-type characters within a letter are obtained by holding one key closed throughout the entire letter while operating the opposing key long enough in the middle of the letter to get the desired string. When both keys are released together, the terminal character(s) is determined by the lastly-closed key. When the keys are released independently, the terminal character(s) is selected by the still-closed key.

### Using the Key

One can, of course, attack the keyer as if it were an ordinary bug or start-stop automatic key, or with any intermediate technique up to that realizing full usage of all functions. Since a given key need not be released to permit selection of an opposite-type character, the motions on the keys may be as careless as the mood dictates, with all kinds of overlap. The *one and only* requirement is that the two keys be closed in the proper order for the letter being sent. The output comes up straight and perfect.

A few specific examples of full sequencer usage are in order; otherwise an operator might never discover the really easy way to make a CQ, a numeral or, for that matter, any of the combinations. For the call "WIAW," both keys may be *squeezed* together four times, each time allowing the dot side to close at least a few microseconds before the dash side. They are both held at least until the last dash of each letter starts, and they are necessarily released between letters only long enough to establish automatic interletter spacing. "W6BJ" calls for similar technique, with the dash key making first contact on the "6" and the "B."

A question mark results most easily from continuous closure of the dot key for the entire duration, with the dash key operated any time during the second dot. The dash key is released anywhere from the start of the second dash up to due time for the first terminal dot. The reverse procedure gives a comma. A numeral such as "3" is made by holding dots throughout



Here is an all-electronic version of the "key with a memory," the "Ultimatic." Several improvements over the multiple-relay version have been incorporated in this newer version.

\* 2296 West Nicolet, Banning, Calif.

<sup>1</sup> Kaye, "The 'Ultimatic'—a Key with a Memory," *QST*, February, 1953.

the number, closing up the dash side any time after the third dot starts. Both keys may be released together any time after the beginning of the second dash, or independently.

That barecat "CQ" is a pushover: continuous closure of the dash key throughout each letter, with the dots flicked in indiscriminately, taking full advantage of the memory leeway. The "C"

can be started with the "squeeze" technique, or it can be made with two quick squeezes just long enough to trip the memories. This is true for *any* combination whose first two characters are of opposite type. In context, a given letter will normally be manipulated differently between different preceding and following combinations, to minimize seesaw motion. All code combinations

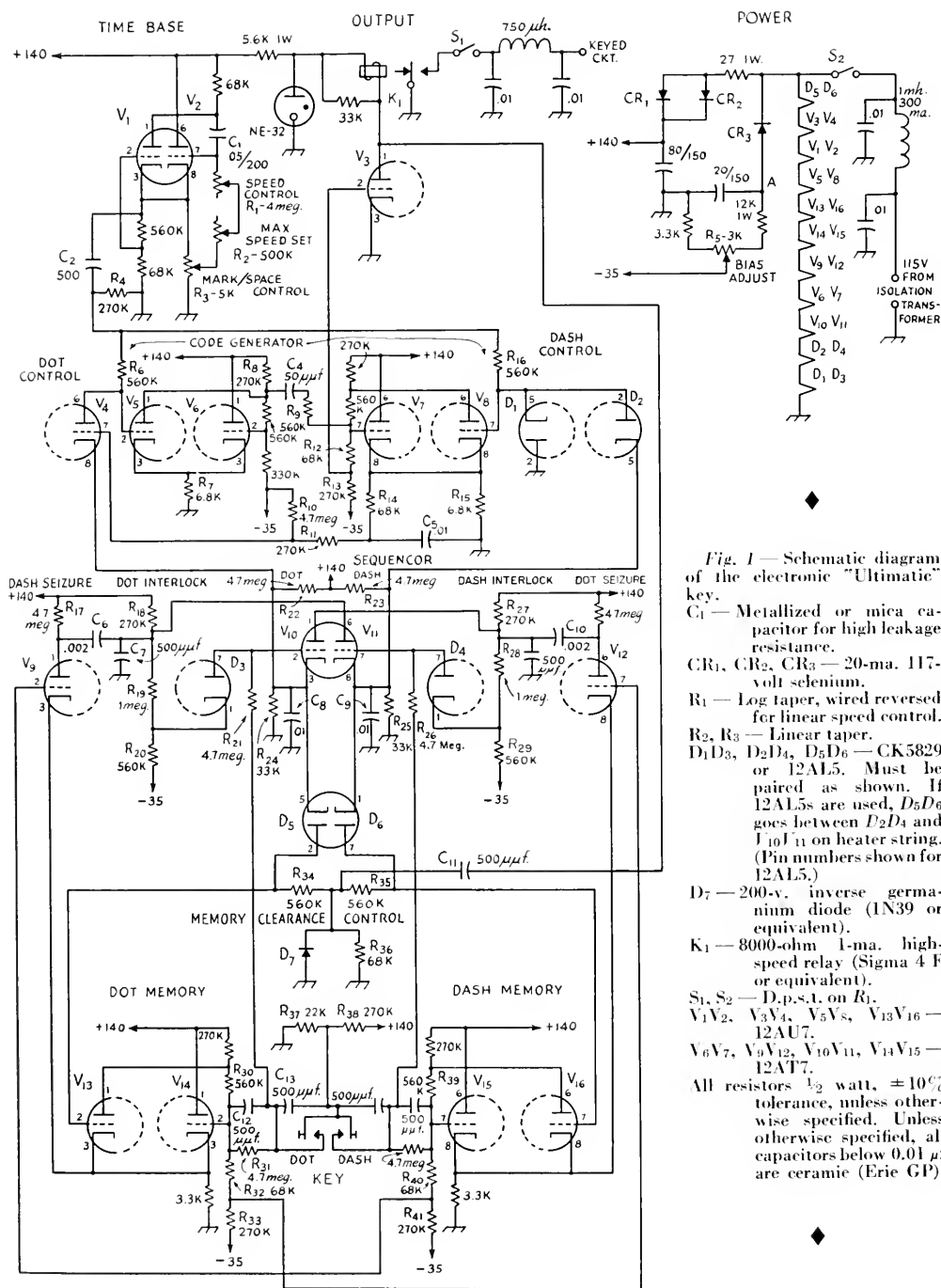


Fig. 1—Schematic diagram of the electronic "Ultimate" key.

C<sub>1</sub>—Metallized or mica capacitor for high leakage resistance.

CR<sub>1</sub>, CR<sub>2</sub>, CR<sub>3</sub>—20-ma. 117-volt selenium.

R<sub>1</sub>—Log taper, wired reversed for linear speed control.

R<sub>2</sub>, R<sub>3</sub>—Linear taper.

D<sub>1</sub>D<sub>3</sub>, D<sub>2</sub>D<sub>4</sub>, D<sub>5</sub>D<sub>6</sub>—CK5829 or 12AL5. Must be paired as shown. If 12AL5s are used, D<sub>5</sub>D<sub>6</sub> goes between P<sub>2</sub>D<sub>4</sub> and I<sub>10</sub>I<sub>11</sub> on heater string. (Pin numbers shown for 12AL5.)

D<sub>7</sub>—200-v. inverse germanium diode (1N39 or equivalent).

K<sub>1</sub>—8000-ohm 1-ma. high-speed relay (Sigma 4 F or equivalent).

S<sub>1</sub>, S<sub>2</sub>—D.p.s.t. on R<sub>1</sub>. V<sub>1</sub>V<sub>2</sub>, V<sub>3</sub>V<sub>4</sub>, V<sub>5</sub>V<sub>8</sub>, V<sub>13</sub>V<sub>16</sub>—12AU7.

V<sub>6</sub>V<sub>7</sub>, V<sub>9</sub>V<sub>12</sub>, V<sub>10</sub>V<sub>11</sub>, V<sub>14</sub>V<sub>15</sub>—12AT7.

All resistors  $\frac{1}{2}$  watt,  $\pm 10\%$  tolerance, unless otherwise specified. Unless otherwise specified, all capacitors below 0.01  $\mu$ f are ceramic (Erie GP).

other than those made up of straight series of like characters (I, S, H, 5, M, O) follow one of these illustrations in full or part, or they can be made by any intermediate motion down to that used on a Vibroplex. And with perfect results, regardless of fumbling!

### General Circuit Data

As the circuit diagram <sup>2</sup> in Fig. 1 shows, power is derived from line-type rectifiers. The tube heaters are in series across the line. Alternatively, the heaters can be fed in parallel or series-parallel from a suitable transformer. The plate and bias voltages are obtained from a 117-volt 40-ma. winding, or they can be borrowed from an available source via VR tubes. The NE-32 maintains constant relay current for stable mark-to-space ratio at all line voltages. An isolation transformer is, of course, mandatory unless the station is designed for "hot-line" operation throughout, through the use of appropriate safety grounding.

For long tube life, maximum plate current in most tubes runs around  $3\frac{1}{2}$  ma., although some tubes draw less than  $\frac{1}{2}$  ma. The pulse peak in  $V_2$  hits 6 ma. The keyer is completely stable with line voltages from 80 to 135, but it goes berserk if too much r.f. gets back to it through external leads. Voltages mentioned for various points in the circuit, as measured with a v.t.v.m., obtain with average tubes and 10-per-cent-tolerance components at 113 line volts and -33 volts bias.

### Construction

This particular unit was built in a Channel-Lock box cut down to 4 by 4 by 3 inches. The mounting plate fastened to the front panel section provides  $\frac{7}{8}$  inch below for components and  $2\frac{1}{16}$  inches above for tubes. All surfaces except the front are perforated with  $\frac{1}{8}$ -inch ventilation holes on  $\frac{1}{4}$ -inch centers, with additional  $\frac{5}{16}$ -inch access holes in the bottom for  $R_3$  and  $R_5$ .

To minimize bulk, the CK-5829 subminiature diodes and the NE-32 are wired direct without sockets. If 12AL5s are substituted for the expensive subminiature diodes, with relay output, the housing depth requirement is  $4\frac{3}{4}$  inches for another row of tubes. With electronic output instead of the relay, the two additional potentiometers can be stacked above  $R_3$  and  $R_5$ , with top-side access, and the NE-32 can be eliminated. It is entirely feasible, of course, to provide room for three 12AL5s by reducing the size of the keys. Subminiature potentiometers would then occupy the space below the chassis vacated by the CK5829s.

Further reduction of over-all size is not recommended. The thing already runs hotter than the proverbial two-buck pistol, with the present amount of compression. On the contrary, one should really spread it out in a big box or rack mounting, bringing out the key and

• Two years ago, W6SRY described his "key with a memory," which made it possible to send perfect code without perfect manipulation by the operator. The one stumbling block for some constructors was the multiplicity of relays used in the circuit. We are pleased to present the all-electronic version, which not only eliminates the need for critical relays, but makes for still greater handling ease by the operator.

The length of the article requires that it be published in two parts. We depart from custom in presenting the circuit and constructional details before the circuit explanation, to better serve the many amateurs who have written to the author requesting details on this key. Part II (next month) will explain how the circuits work and how the output relay can be eliminated.

speed-control leads in separate shielded and p-section r.f.-filtered pairs. Speed-control lead r.f. by-pass capacitors should not exceed 0.001  $\mu$ f. each side of 750- $\mu$ h. r.f. chokes. The key-lead r.f.

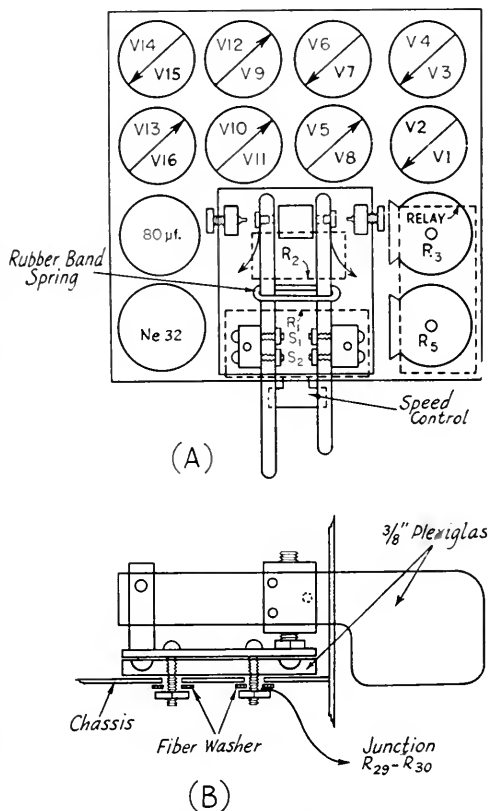


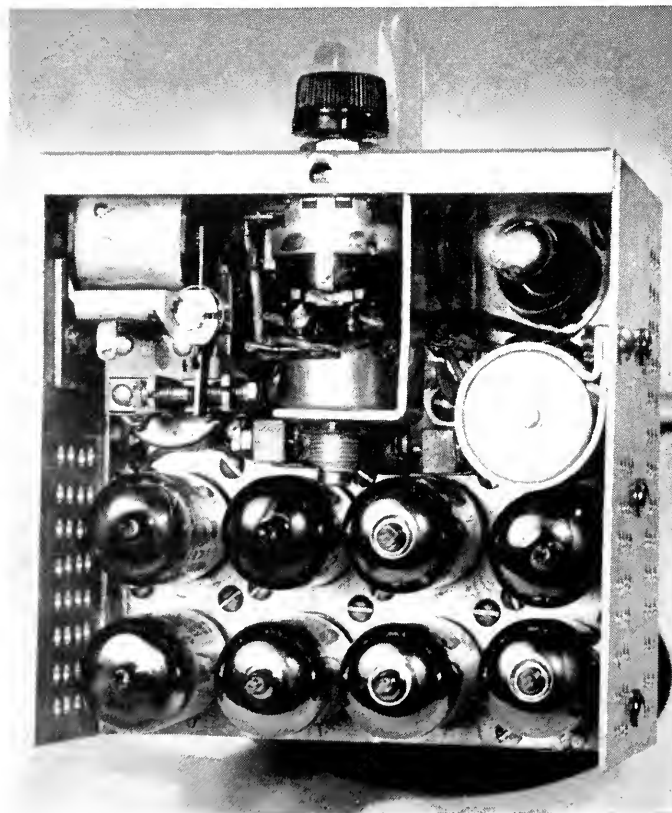
Fig. 2 — (A) Top view of a suggested tube-socket and control arrangement for the Ultimate key. Arrows point in direction of pin gap. (B) Details of the key-lever construction. The screws are 8-32.

<sup>2</sup> Copies of the enlarged schematic diagram are available for 50 cents from ARRL's Technical Information Service, 38 La Salle Road, West Hartford, Conn.

by-pass capacitors should make up the total 500  $\mu\text{f.}$  of  $C_{13}$  and its corresponding capacitor on the dash side.

Fig. 2A and a photograph show the top view of a socket orientation providing optimum component dress, with resistors mounted on and between the sockets. All No. 9 pins and center shields were removed to provide more room for parts. With the heaters connected in parallel for 6.3-volt operation, the No. 9 pins should be bent over and soldered to the mounting rings. If the series heater connection is used, the heater leads should be dressed very tightly against the chassis, to minimize a.c. fields.

Fig. 2B shows a side view of the key levers. Although a cone pivot bearing is definitely superior, the threaded bearing pivots in this unit proved surprisingly good, and they can be readily built with a minimum of effort. The keys are assembled on a  $1\frac{1}{2} \times 2 \times 1\frac{1}{16}$ -inch metal plate, insulated from the chassis by  $\frac{3}{8}$ -inch Plexiglas levers and threaded on the 8-32 pivot bolts. (Metal pivot blocks, tapped for 8-32, are bolted to the  $\frac{3}{8}$ -inch Plexiglas.) The pivot bolts are secured to the key plate with nuts, as shown. The "spring" tension is adjusted by sliding the rubber band to an appropriate position. This method of supplying spring tension absorbs most of the sloppiness that might result from too loose a thread fit in the pivot screws, a condition apt to arise from filing threads to eliminate binding.



During construction of the many miniaturized models preceding this one, it was found wise to wire subcircuit by subcircuit, performance checking each subcircuit before going on. Nothing is so exasperating as finding a bonehead error buried under three layers of resistors massed together with  $\frac{1}{8}$ -inch leads. Ask me — I know!

### Trigger & Bias Adjustment

The sole adjustment procedure consists of running the bias up and down at  $R_5$  with various line voltages between 80 and 135, to find the range of stable operation for each functional circuit. At each test setting, check over-all operation and each circuit individually with a v.t.v.m., in accordance with the functional summaries.<sup>3</sup> Observation of circuit performance can be greatly simplified by slowing things down to a walk with 0.25  $\mu\text{f.}$  (metallized, to minimize leakage) shunted across  $C_1$  of Fig. 1, so that the v.t.v.m. needle stands still long enough to be read. Approximate expected voltages are given in the circuit description. Others are readily calculated from the divider strings, bearing in mind grid-loading effects. With normal-tolerance components, it is to be anticipated that one or two of the subcircuits may turn up with a bias range centering somewhat off the median value. The addition of a 2- to 4-megohm shunt across the appropriate element of the resistance string will pull the range center to median. The final setting of  $R_5$  is at the average of the bias-range midpoints for all the subcircuits at expected nominal line voltage.

Tube and component aging is compensated at  $R_5$ , though readjustment will not be required until prolonged aging has drastically shifted the tolerance midpoints. The model shown here tolerates a  $\pm 5$ -volt bias shift from the  $-33$ -volt median established at a nominal 113 line volts.

### Mark-Space Adjustment

With 0.004- to 0.01-inch relay armature travel and continuous 15-w.p.m. dots,  $R_3$  is set for half-scale reading of an ohmmeter connected across

<sup>3</sup> Given in Part II.



This top view shows why the author does not recommend building the key into a small volume.



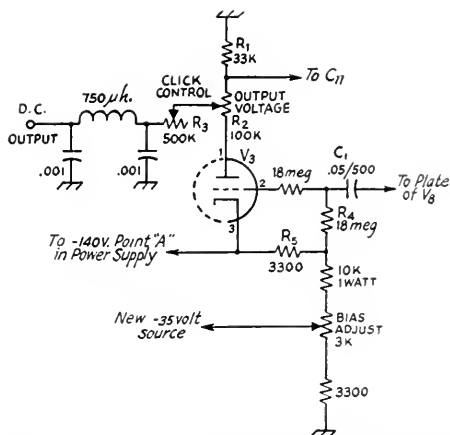


Fig. 3 — Optional output circuit for the Ultimatic. If this circuit is used, the heaters of  $V_3V_4$  must be moved to the ground end of the heater string in Fig. 1.  $C_1$  — Metallized capacitor.

the output terminals. Then at the desired maximum dot speed the relay spring tension is adjusted for midscale on the ohmmeter. Steady dashes should read one-quarter scale. The two adjustments interact a bit, so two or three runs may be necessary to establish a constant mark/space at all speeds. Since  $R_3$  affects the top speed,  $R_2$  is set last, with  $R_1$  at minimum, for the desired top speed.

With electronic output,  $R_1$  of Fig. 3 is set, on spacing output, for slightly more than cut-off for the vacuum-tube keyer to be used.  $R_3$  of Fig. 1 is then set, on 30-w.p.m. dots, for the desired mark/space ratio as indicated by final-amplifier plate current.  $R_2$  of Fig. 1 is trimmed for the top speed.

### Test Equipment

It must be remembered that the *only* test equipment that can possibly be used to read many of the voltages in the Ultimatic is a v.t.v.m. with an input impedance on the order of 30 to 50 megohms, or an equivalent cathode-fol-

lower device. Even with a 1-megohm isolating resistor in the probe, the triggers will sometimes be tripped by capacity as contact is made. To determine which way a circuit is stabilized, it is best to read across the cathode resistor, touching the grid-plate strings only for an actual voltage.

### Learning To Use the Key

Trial runs on guinea-pig operators indicate that it takes a little time to reeducate one's reflexes so that at high speed one can take full advantage of all of the sequencing functions and leeway tolerances. Full use of the seizure function calls for a considerable departure from standard techniques. However, the new tricks are readily acquired because they demand much less effort. One who has never used anything but a pump handle has a nice advantage and can master the gadget much faster because he has no cortical synapses to disconnect, nothing to unlearn. However, and this is the beauty of the thing, whatever technique is being used on the present bug or start-stop autokey will produce perfect results at usual sending speeds after 5 minutes of practice. Mastering the tricks simply calls for experimentation, using the functional summaries and specific examples as guides. Every operator will acquire his own personal technique, equally good but possibly different. Initial practice should be at low and moderate speeds to facilitate study of the relationships between the Selector-memory-sequencer, the time base, and the hand.



A bottom view of the key clinches the argument for allowing more room for the circuit components.

# Graphical Symbols for Radio Diagrams

*Including Criticisms of "Condenser" and "Capacity"*

BY HAROLD P. WESTMAN \*

• A new American Standard covering symbols for use in electrical circuit diagrams was adopted last year, and there is now under way a serious effort to persuade all users of such symbols to make their practices conform with it. The advantages of having one universal language instead of a large collection of dialects should be obvious, and beginning with this issue the symbols in *QST* schematic diagrams will be those of the new Standard.

GRAPHICAL SYMBOLS is the high-brow name for the drawings that we use in circuit diagrams. Originally, they were crude pictures of actual pieces of equipment but, to save time and to permit a drawing to represent more than one manufacturer's design of a part, the finer details were soon omitted and the pictures gradually lost their resemblance to the actual equipment. They developed into symbols rather than pictograms. In practice, this means that now we have to learn the meanings of these symbols because they don't look enough like the actual equipment for us to identify one from the other. Life does get complicated.

Those of us who are interested only in radio have learned quite a number of symbols and are entirely willing to go on using them until we find that they no longer suit our needs. This is also true of people concerned only with power applications of electricity. Unfortunately, these two groups paid very little attention to each other's symbols over the years with the result

that direct conflicts developed for such fundamental units as inductance, resistance, and capacitance.

During the second World War, the armed forces in the United States arranged something of the nature of a shotgun wedding and both the power and communication engineers agreed "for the duration" on a set of basic symbols that did not contradict each other. These were put in effect by *QST* at that time.

Unfortunately, there has been some tendency on both sides to drop back into our old habits and this was encouraged to some extent by the fact that the wartime action concerned only a few basic symbols; other points of confusion existed in the remainder of the standards.

### New Symbol Standards

After several years of work, a new American Standard<sup>1</sup> has been approved and it replaces five previous standards on electrical graphical symbols. This single standard includes symbols for both communication and power drawings. It contains symbols for all items that were in the previous standards and many more.

Numerous changes have been made so that the symbols will be consistent with each other and while in some cases more than one symbol is permitted for a given item, there are no cases where a symbol has more than one meaning. Thus, the reader should never be in doubt as to what the author intended even though the author may have had a choice as to the particular form of the symbol he would use.

In general, there will undoubtedly be a tendency for each group to use those new symbols that are most like the old familiar forms. In some cases, the new symbols are easier to draw and will be used for this reason.

Fig. 1 shows where the greatest conflicts were. The communication resistance and the power inductance were identical as were the communication capacitance and the power open contacts. Briefly, the power people gave up the

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<sup>1</sup>"American Standard Graphical Symbols for Electrical Diagrams, Y32.2-1954," issued by the American Standards Association, 70 East 45th St., New York 17, N. Y. (Price, \$1.25, postpaid.) Published as *IRE Standards on Graphical Symbols for Electrical Diagrams, 1954*, by the Institute of Radio Engineers, *Proceedings of the I.R.E.*, volume 42, pages 965-1020; June, 1954.

	POWER	COMMUNICATION	COMPROMISE
RESISTANCE			OR
INDUCTANCE			OR
CAPACITANCE			
CONTACTS OPEN			OR
CLOSED			OR

Fig. 1 — Symbols for basic electrical quantities as used originally by power and communication people, and the compromise symbols now standard for both groups.

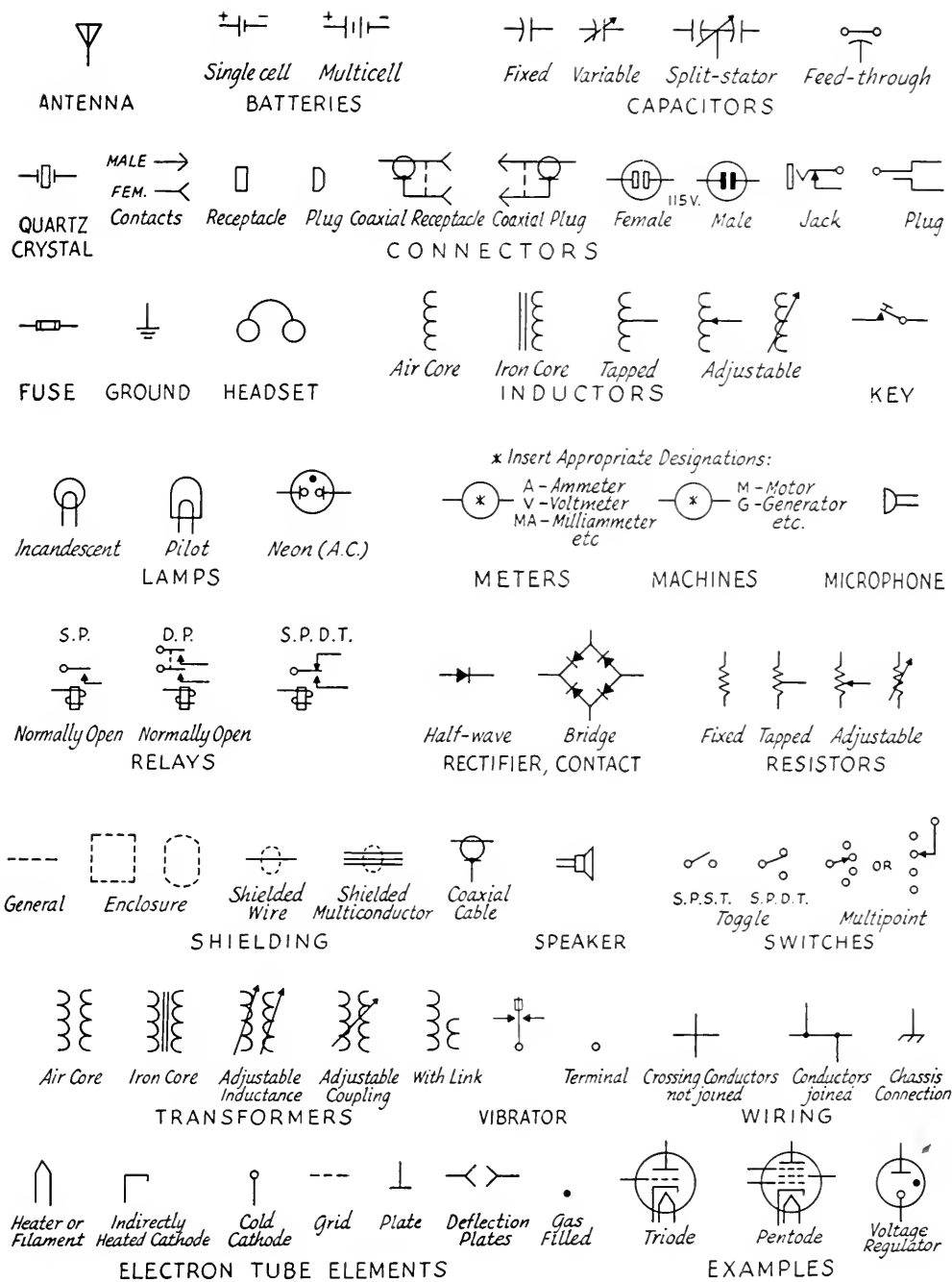


Fig. 2 — Representative symbols according to the new American Standard. These are typical of what will be the future QST practice, and in some cases involve a choice where alternatives are permissible. An important change is the omission of a "hook" where one wire crosses another without making a connection. A connection is shown by a dot.

The small circle is used only as a terminal (including a switch contact as a terminal) and does not represent a pivot in the switch and jack symbols shown above. Terminals may be indicated by adding the small circles to any component but the new Standard does not require their use.

Note particularly the symbol for a chassis connection. It does not imply that the chassis is connected to earth. If an actual ground connection is necessary, it will be indicated.

# A Radical Approach to Single Sideband

## Revolutionary Ideas for Simplifying 'Phone Communication

BY LARSON E. RAPP,\* W1OU

• Here is an article that no discerning 'phone man can afford to pass up. Although the ARRL Laboratory staff has not had an opportunity to confirm Mr. Rapp's findings, past experience with his disclosures have shown us (and our readers) what we can expect from this sage.

THERE can be no question in the mind of any active radio amateur that the most progressive step in the past pentad has been the immediate and wholehearted acceptance of single-sideband telephony. One has only to listen in on any of the low-frequency 'phone bands and hear the pioneers patiently explaining the virtues of s.s.b. to the younger and more timid amateurs to realize that some really splendid work is being done. Many old-timers can be heard jocularly referring to the medium as "Chinese modulation" or "those Donald Ducks," in an obvious effort to put the newcomers at ease.

However, because there is still some reluctance on the part of technically-unskilled amateurs to adopt single-sideband technique and thus enjoy its advantages, the author feels that the time is right to disclose his latest invention. Although originally developed for patent purposes only, the invention is too meritorious to be withheld from radio amateurs, who are always willing to try anything if it is simple and cheap enough. Ergo, before disclosing the invention and the circuits, it is well to review a few basic principles.

The generally-acknowledged advantages of single-sideband are greater effectiveness for the same total power to the transmitter, ability to use voice-operated break-in, and freedom from TVI. On the debit side of the ledger are the use of unfamiliar circuits, inability to use a.v.c. and S-meter at the receiver, and the tendency of SWLs to overlook such a signal in favor of one of the a.m. variety. It occurred to the author that what was needed to make single sideband universally acceptable was a simplification, both at the transmitting and at the receiving end, and this reasoning was confirmed by consultation with several other experts in this and allied fields. Since "a clear statement of the problem is the first step toward a solution,"<sup>1</sup> no time was lost in getting down to work. Through fortuitous and careful design, the eventual solution also overcame the objectionable characteristics of conventional (and now old-fashioned) s.s.b.

\* Kippering-on-the-Charles, Mass.

<sup>1</sup> Humperdink, E., "Orfeo ed Euridice," Part IV.

<sup>2</sup> Rapp, "The Double-Spectrum Theorem," *QST*, April, 1952.

### The Approach

Referring to the literature on single sideband, it is almost amusing to observe how blindly one investigator follows another in approaching the problem, with the inevitable result that they have all overlooked the very obvious simplification that will soon be disclosed. For example, every author starts out by describing a double-sideband-plus-carrier a.m. signal, and then laboriously tells of methods for first eliminating the carrier and then one sideband. It is this line of reasoning that has resulted in a blind spot in the thinking which, fortunately, is about to be removed.

Your author approached the problem from another tangent. Having observed that s.s.b. operators still suffer occasionally from BCI (interference to broadcast receivers), and recalling that narrow-band f.m. is immune to BCI troubles, combining the merits of n.f.m. with s.s.b. seemed like a fruitful avenue of approach. It was, and the final solution was really too good to be true. It is being disclosed now so that others can appreciate its advantages.

### The Solution

As all amateurs know, an f.m. signal is generated by a *reactance modulator* working on an oscillator to swing the frequency back and forth about a mean frequency called the *carrier* frequency. To generate a single-sideband-f.m. signal, the author cleverly reasoned that it was only necessary to swing the frequency *on one side of the carrier* — on the low side for the low sideband, and on the high side for the high, or upper, sideband. Fortunately, this offered no great problem, since part of the technique had already been disclosed in an earlier paper.<sup>2</sup> Hence, the generator for a s.s.b.-f.m. signal requires only a speech amplifier of sufficient gain, a "positive/negative" modulator driving a reactance modulator, and an oscillator followed by suitable amplifiers. The desired sideband is selected, of course, by switching to either the "positive" or the "negative" modulation condition.

Astute readers will immediately ask, "But what about carrier elimination?" This is a good question, but one that shows a lack of basic understanding of the system so far. It should be obvious that the carrier isn't present while it is busy swinging over the "sideband" portion of the spectrum, and hence *it is only necessary to eliminate the carrier while one isn't talking*. This is not a difficult problem, and is solved by the method current in vogue among the s.s.b. pioneers; namely, voice-operated break-in. By minimizing the "hold-in" time, the carrier is only apparent between very short pauses, and this

slight disadvantage is more than overshadowed by the obvious advantages of the entire system. A balanced modulator can be used, of course, if the ultimate in tube efficiency is desired, but the other method is the simple approach.

Unlike the old-fashioned s.s.b., this new system needs no carefully-designed mixers for band changing, since s.s.b.-f.m. is like conventional f.m. in this respect and requires only frequency multiplication for bandchanging. Furthermore, there is no real need for careful adjustment of linear amplifiers as there is with the older s.s.b., and a Class C amplifier will handle a single-sideband f.m. signal just as well as will a Class AB<sub>1</sub>, AB<sub>2</sub> or B amplifier. This feature eliminates the need for special bias supplies and an oscilloscope, as well as the need for careful adjustment when shifting frequency. The use of Class C stages throughout results in the highest possible efficiency, but care must be taken to prevent the generation of high-order harmonics that may interfere with TV reception in the vicinity. As a result of these tolerant parameters, s.s.b.-f.m. can be applied to any existing transmitter by making a few simple changes in the oscillator. A block diagram of the basic exciter is shown in Fig. 1.

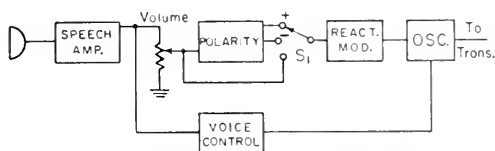


Fig. 1 — A block diagram of the basic exciter.  $S_1$  is the sideband-selector switch. The "+" and "-" points are for upper- and lower-sideband operation — the third position gives conventional f.m. operation and is not necessary except for comparison and tune-up purposes.

and receiving tubes and low-power components can be used throughout

### The Reception of S.S.B.-F.M.

The reader may be wondering what must be done at the receiving end to copy a s.s.b.-f.m. signal and, we are proud to say, this is one of the delightful aspects of the system. It has been pointed out on several occasions that conventional s.s.b. is difficult to tune in — some observers report it is impossible with a conventional a.m. 'phone receiver — but s.s.b.-f.m. eliminates any and all such troubles. It is tuned just like narrow-band f.m. (Signal detuned slightly, to fall on one side or the other of the "slope" of the i.f. characteristic. This is called "slope detection," for obvious reasons.) However, one significant difference becomes immediately apparent, and it is one of the ways an operator can recognize a s.s.b.-f.m. signal in a band loaded with a.m., s.s.b. and n.f.m. signals. In the reception of s.s.b.-f.m., if the receiver is tuned to the *wrong side* of center, the speech becomes inverted, so there is actually only one correct side. Thus the selectivity of the receiver is

increased, because the signal only comes in at one spot on the dial. (Some operators object to the broadness of n.f.m., because it comes in at two spots on the dial. However, n.f.m. is, of course, a double-sideband system, and the two-spot tuning is not so surprising if you stop and think of it in

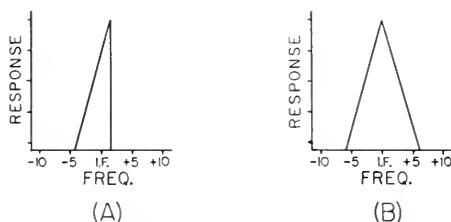


Fig. 2 — (A) Ideal i.f. characteristic for receiving s.s.b.-f.m. Selectable-sideband reception can be used. (B) Ideal i.f. characteristic for general s.s.b.-f.m. reception. Notice that this approaches the i.f. characteristic of current receivers.

this manner.) But, indubitably, the greatest advantage of s.s.b.-f.m. over old-fashioned s.s.b. is that *the need for careful tuning is eliminated*, since the s.s.b.-f.m. need only be tuned on the correct-slope side. There is no longer any need for careful carrier reinsertion! (Remember that the swinging of the carrier is generating the sideband. The carrier has never been eliminated, hence it does not require reinsertion.)

An ideal receiver i.f. characteristic for s.s.b.-f.m. would be one that looks like a right triangle, if everyone agrees to the use of only one sideband and whether it shall be the upper or the lower. Failing this, the best receiver characteristic would be one with a double-ramp configuration. Actually, however, the difference in performance between the ideal and a conventional i.f. characteristic is slight.

### Financial Considerations

Of interest to the impecunious amateur is the investment required for any new type of equipment. One of the criticisms of s.s.b. has been that it is too expensive, since it wastes the large audio tubes and transformers associated with a 'phone station. Unfortunately, s.s.b.-f.m. offers no solution for this complaint, if one already has reached the legal power limit. However, it is suggested that if one's present transmitter has not yet reached the legal limit (this varies throughout the world and even within countries), he may be able to sell his excess audio equipment to some hi-fi enthusiast among the Cadillac station-wagon set.

Any way it is computed, s.s.b.-f.m. is more economical than either a.m. or s.s.b. Its effectiveness being what it is, practically no time will be spent in making fruitless calls. And once QSO has been established, it is practically certain that no time will be wasted in needless repeats. On a strict dollar-for-dollar basis, a s.s.b.-f.m. transmitter shows a 47.2 per cent superiority over a kilowatt s.s.b. rig and a 71.4 per cent advantage over a kilowatt a.m. rig. *In hoc veritas.*

# Using the 6360 Dual Tetrode on 220 Mc.

## *Low-Cost All-Tetrode Transmitter for the 220-Mc. Beginner*

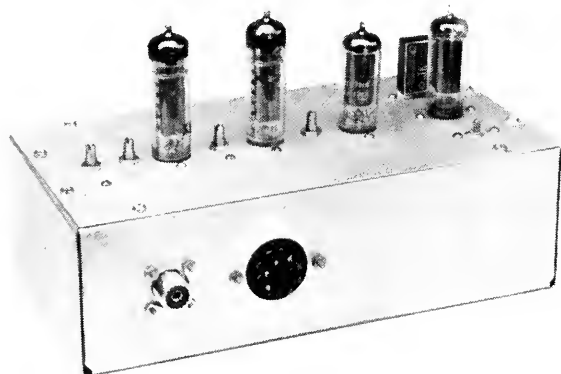
BY EDWARD P. TILTON, WHDQ, AND MASON P. SOUTHWORTH, W1VLH

UNLESS one is content to get along with the various receiving tubes that can be pressed into transmitter service, firing up on 220 Mc. can be a rather expensive proposition. The 832A, surplus variety, has been the only tube that would do the job at power levels above the receiving tubes, without setting the purchaser back a sizable piece of change. And now, unless you already have your 832s, they are no longer very attractive from the standpoint of price. Other tubes usable at 220 Mc. begin at around \$15.00, and range on up from there.

The 6360, a small dual tetrode introduced recently by Amperex, makes the 220-Mc. picture a little brighter. It won't handle quite as much power as its larger brothers, the 6252 and 5894A, but it works well on 220 Mc. and it sells at a receiving-tube price. The tube's low cost is largely

variety, to show newcomers that there are oscillators other than the overtone types used so often in recent years. The tetrode oscillator has an advantage, too; you can put in 8- or 12-Mc. crystals interchangeably. The oscillator plate circuit may be tuned to 24 Mc. or 36 Mc. if 12-Mc. crystals are used, allowing a choice of doubling or tripling in the second stage.

The oscillator is a 6CL6, as is the first multiplier. Type 5763s could probably be substituted in these stages, or a single 6360 can be used for both, if you want to standardize on one tube type. A balanced plate circuit is used in the multiplier, so that its output can be capacitively coupled to the 6360 tripler grids. We insert a hint at this point: If you run into trouble with insufficient grid drive to the 6360 tripler, try putting a small plastic trimmer between the low side of  $L_2$  and



The 220-Mc. tetrode transmitter. At the right are the 6CL6 crystal oscillator and multiplier stages, with the 6360 tripler and amplifier in the center and left, respectively. The rig is built on a sheet of aluminum which is screwed to an inverted chassis.

the result of its single-ended construction. All connections are brought out through the base, so it can be made on the same machinery that grids onto receiving tubes.

Actually, the 6360 is built a good deal like an oversized 6J6, with screens added. A central heater and cathode have pairs of other elements on either side. Compact construction and short leads result in a tube that works well on 220 Mc., and will even go to 420, in a pinch. One 6360, tripling, will drive another as a straight-through amplifier on 220 Mc., and that is how the tubes are used here.

### **Transmitter Circuit**

Circuitwise, the rig described here is a departure from the technique we have used in most v.h.f. transmitters described recently, in that a conventional tetrode crystal oscillator is used, rather than a triode in an overtone oscillator. This switch was made mainly for the sake of

ground, to balance up the capacitances on either side. It was not needed in the original, but it would be well to remember the suggestion, just in case.

The 6360 push-pull tripler to 220 Mc. is inductively coupled to the push-pull final stage. No neutralization is shown in Fig. 1. Should neutralization be needed, a method for achieving it is given later. Output from the final 6360 plate circuit is taken off through coax, and provision is made for tuning out the reactance of the link, with  $C_4$ .

### **Construction**

The transmitter is built on a flat plate of sheet aluminum 5 by 10 inches in size. This is screwed to a standard aluminum chassis of the same dimensions, that serves as both case and shielding. If more complete shielding is required, a perforated metal cover may be made to go over the top, as was done with the 6- and 2-meter rigs

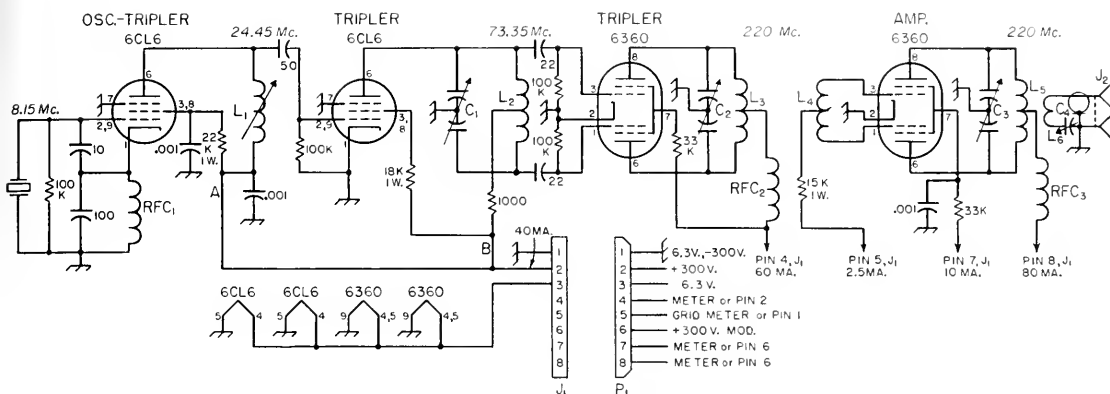


Fig. 1 — Schematic diagram and parts information for the 220-Mc. tetrode transmitter. Resistors are half watt unless otherwise specified. Capacitor values below 0.001 are in  $\mu\text{f}$ .; all ceramic.

$C_1$  — 11- $\mu\text{f}$ . miniature butterfly variable (Johnson 11MB11).

$C_2, C_3$  — 5- $\mu\text{f}$ . miniature butterfly variable (Johnson 5MB11).

$C_4$  — 15- $\mu\text{f}$ . miniature (Johnson 15M11).

$L_1$  — 14 turns No. 28 enam. on  $\frac{3}{8}$ -inch iron-slug form (National XR-91).

$L_2$  — 7 turns No. 20,  $\frac{1}{2}$ -inch diam.,  $\frac{3}{16}$  inch long, center-tapped (B & W Miniductor No. 3003).

$L_3, L_5$  — 4 turns No. 18 enam.,  $\frac{3}{8}$ -inch diam., center-tapped. Space twice diameter of wire, except for  $\frac{1}{8}$ -inch space at center.

described in October, 1954, *QST*. All parts except the power and coaxial output connectors are mounted on the top plate. The two connectors mount in holes in the rear wall of the chassis. The mounting screws are held in place on the fittings with nuts and other nuts on the outside of the chassis hold the fittings in position.

The tube sockets are along the centerline of the plate, two inches center to center, with the oscillator socket  $1\frac{3}{8}$  inch in from the right end, as seen in the photographs. The crystal socket and the oscillator plate coil,  $L_1$ , may be seen at the lower and upper right, respectively, in the bottom view. The tripler plate tuning capacitors are midway between their respective sockets.

Except for the power leads, there is no "wiring" in the usual sense, as all r.f. leads should be extremely short. The decoupling resistors and r.f. chokes in the various power circuits are supported on tie points. Three single-lug strips and

$L_4$  — 2 turns same as  $L_3$ , center-tapped. Adjust turns spacing and degree of coupling to  $L_3$  for maximum grid current.

$L_6$  — 2 turns same as  $L_5$ , close-wound. Adjust position at center of  $L_5$  for maximum output.

$J_1$  — 8-pin male chassis fitting (Amphenol 86-RCP8).

$J_2$  — Coaxial fitting, female (Amphenol 83-1R).

$P_1$  — 3-contact power cable connector, female (Amphenol 78-RS8).

RFC<sub>1</sub> — 750- $\mu\text{h}$ . r.f. choke (National R-33).

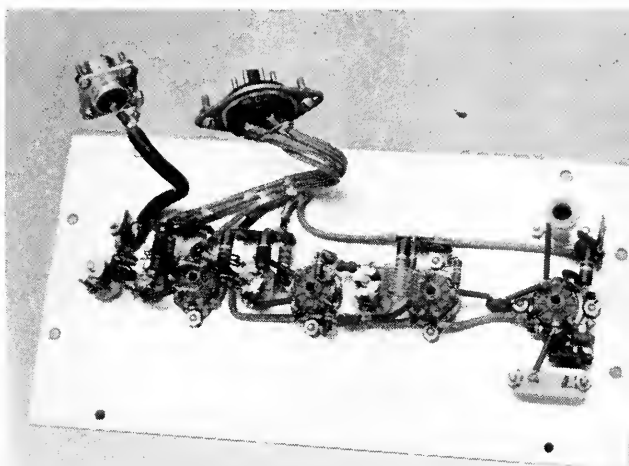
RFC<sub>2</sub>, RFC<sub>3</sub> — 17 turns No. 28 enam. on high value 1-watt resistor, or use Ohmite Z-235.

two double-lug ones are needed. All the power wiring is done with shielded wire, as an aid to TVI prevention. The coils  $L_2$ ,  $L_3$  and  $L_4$  are soldered directly to the stator support bars of their trimmers, with the shortest possible leads.

### Adjustment

The power supply for testing the transmitter should deliver at least 3 amperes at 6.3 volts, a.c. or d.c., and 200 to 300 volts d.c., at 200 ma. The lower voltage is plenty for the test work, though up to 300 may be used when everything is properly adjusted. If a 300-volt supply is used for the testing, the tubes can be protected from excessive drain by connecting a 5000-ohm 10-watt resistor in series with the power supply lead. The power connectors,  $J_1$  and  $P_1$ , make provision for metering all plate circuits except those of the oscillator and first tripler. The power leads to these are shown connected together, to Pin 2 of  $J_1$ , but during testing they should be fed sep-

Lifting the top plate of the 220-Mc. transmitter, in the position shown in the other photograph, the underside shows all the parts except the tubes and crystal. Note the method of attaching the power and coaxial fittings. Nuts hold their mounting screws in place, so that they can be fastened to the rear wall of the chassis.





arately through a milliammeter, as described below.

Testing will be easier if a receiver capable of tuning to 8 and 24 Mc. is available. Connect a 0-50 or 0-100 milliammeter between Pin 2 of  $J_1$  and the oscillator plate-screen circuit, at the low side of the 22,000-ohm screen-dropping resistor, point *A* on the schematic. Be sure that the tripler plate and screen resistors are disconnected for the time being, to prevent this stage from drawing current. Apply 200 to 300 volts d.c. through Pin 2 of  $P_1$ , and tune the plate circuit of the oscillator to the third harmonic of the crystal frequency. If you can listen on this frequency (24.45 to 25 Mc., depending on choice of crystal) a large increase in signal strength should be noted as the coil is tuned through resonance. A double check on frequency with a calibrated grid-dip or absorption wavemeter is recommended. Oscillator plate-screen current will be about 20 ma.

Now connect the oscillator plate-screen power lead directly to Pin 2 on  $J_1$ , and insert the meter in the lead to the tripler plate-screen circuit, point *B* on the diagram. Apply voltage and tune the tripler plate circuit for maximum output at 73.35 to 75 Mc. A 2-volt 60-ma. pilot lamp with a single-turn loop of insulated wire, about a half inch in diameter, may be coupled to  $L_2$  to serve as an output indicator. The 6CL6 tripler plate-screen current will be about the same as the oscillator, around 20 ma. at 300 volts.

Now wire the power leads to these two stages as shown in the diagram. Leave the 300-volt lead connected to Pin 2 of  $P_1$ , and connect a 100-ma. meter between Pins 2 and 4, to measure the 6360 tripler plate-screen current. A low-range milliammeter, about 0-10 ma., should be connected between Pin 5 and Pin 1, to measure final grid current. Tune  $C_2$  for maximum indication on this meter. With no plate voltage on the final stage, there should be at least 3 ma. grid current. Adjust the spacing between  $L_3$  and  $L_4$  carefully, retuning  $C_2$  after each adjustment, for maximum grid current.

In adjusting the final stage, we will ignore the eventual use of a modulator, and connect our power supply direct to the final stage temporarily. Information on modulation will be given later. Solder a jumper between Pins 2 and 4 on  $J_1$ , so that voltage will be supplied to the 6360 tripler. Connect a temporary jumper between Pin 2 and Pin 7, to feed voltage to the final screen, and connect the 0-100 milliammeter between Pins 2 and 8, to measure final plate current. A 10- or 15-watt light bulb may be used as a temporary dummy load, connected to  $J_2$ . Apply voltage and tune  $C_3$  for minimum plate current, or for maximum output as indicated in the lamp load. Adjust  $C_4$  for best output. The setting of  $C_4$  and the degree of coupling between  $L_5$  and  $L_3$  will be different for an antenna, however, as the lamp is not a good load at this frequency.

If the stage is completely stable, maximum output, maximum grid current and minimum plate current should all occur at the same setting

of the plate tuning capacitor,  $C_3$ . Another check for neutralization is to cut the drive for a brief period by removing plate and screen voltage from the tripler. Grid current should drop to zero when this is done. If it does not, the final stage is oscillating, and must be neutralized. In the original model, there was no actual self oscillation, but the stage was not completely stable until a small amount of neutralization was added.

This is done very simply with the 6360. The leads are so arranged within the tube that all that is required for neutralization is a very small capacitance between Pins 3 and 6, and between Pins 1 and 8. A stub of No. 18 wire about  $\frac{3}{8}$  inch long is soldered to Pin 6, with its opposite end "looking" at Pin 3. A similar stub is soldered to Pin 8, with its free end adjacent to Pin 1. The ends can then be bent toward or away from the grid pins to give the required capacitance.

### Putting the Rig on the Air

When all stages have been adjusted correctly, the plate voltage may be increased to 300 on all stages, if you want to run the maximum power of which the tubes are capable. Current drains indicated on the schematic diagram are for 300-volt operation. Staying at 250 volts or less allows more conservative operation, and may be well worth while, in the interest of longer life for the 6360s. There is no great advantage to be gained from pushing the tubes excessively, as doubling the power output will net less than one S unit improvement in signal level at the receiving end.

In feeding power to an antenna system using coaxial line, it is merely necessary to connect the coax to the output fitting,  $J_2$ , and adjust the coupling and  $C_4$  for maximum radiated power. A field-strength meter that will be helpful in this was described in *QST* for December, 1953, page 43. If 300-ohm Twin-Lead or open-wire line is used to feed the antenna, coupling to the transmitter is done with a coaxial balun, made as shown in Fig. 2. The balun may also be used

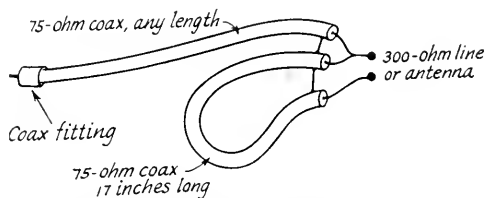


Fig. 2 — Coaxial line balun for feeding balanced loads from the 220-Mc. transmitter.

at the antenna end of the coax, if the antenna system is designed for 300-ohm balanced lines. The part of the balun that plugs into the transmitter can be of any convenient length.

To modulate the transmitter, the final plate and screen are fed through the secondary of the modulator output transformer, as shown schematically in Fig. 3. The circuit is shown in basic

(Continued on page 126)

# Director Beams

## *Improved V.H.F. Antenna Performance with Fewer Elements and No Reflectors*

BY FRANK C. JONES,\* W6AJF

**N**EARLY all v.h.f. beam antennas use resonant reflectors, to provide good forward gain and reduce signal pick-up and radiation from the rear of the array. However, an investigation of several types of beams conducted in the 220-Mc. band showed that it is possible to dispense with reflectors entirely. Furthermore, by modification of the usual collinear arrangement, a design was evolved that used only half as many directors as one would expect.

The result was a 6-element array with performance equivalent to that of the usual collinear arrangement having four half-wave driven elements, with reflectors. Two of these can be combined into a 12-element beam that is equal to the conventional 16-element design. Of even greater interest, the front-to-back ratio can actually be made better with directors only, without the usual sacrifice in forward gain that is entailed in adjusting for optimum front-to-back ratio.

If a reflector type of beam with four driven elements and four reflectors is adjusted for good front-to-back, over 12 db., the forward gain is reduced at least 1 db.; if it is adjusted for best forward gain, the front-to-back ratio is liable to be considerably less than 10 db. On the other hand, a director-type beam of four driven elements and two directors can be adjusted to provide more than 15 db. front-to-back ratio, without sacrificing more than  $1\frac{1}{2}$  db. forward gain.

An example is a 12-element 2-meter director beam at W6AJF that has a front-to-back of 17 db. and a forward gain of approximately 13 db. A conventional 16-element collinear array can be adjusted for about this same gain, but the back lobe becomes objectionable, so the usual dimensions provide about 12 db., with a front-to-back ratio of 10 to 12 db.

### *Something for Nothing?*

This better front-to-back and more forward gain with less elements in the array looks like

\* 850 Donner Ave., Sonoma, Calif.

◆  
A 6-element 2-meter array that outperforms the conventional 8-element job. It uses shortened driven elements in pairs, with a single director for each pair. W6AJF's daughter tries it on for size.  
◆

a claim of something for nothing, but such is not the case. There is a price. The director beam must be made with close director spacing to obtain good rejection off the back without sacrificing forward gain. This means low radiation resistance at the current points, less bandwidth and increased difficulty in matching the beams to standard transmission lines.

The bandwidth limitation is not serious at 144 or 220 Mc., as the director-type array has a bandwidth of about 5 Mc. in these bands, compared to 8 or 12 Mc. for the conventional collinear designs. The bandwidth of the director beam for 50 Mc. would be only about 2 Mc., and perhaps 12 Mc. or so at 420 Mc. These values are too low for full band coverage, so the design would have to be for the parts of these bands which are of primary interest. The bandwidth is ample for the 144- and 220-Mc. bands with design centers at 146 and 222.5 Mc.

A close-spaced director, whether used with one or two driven elements, detunes the driven elements and all elements have to be made a little longer than expected. For example, a director in this design is 39 inches long for the 2-meter band, and  $25\frac{1}{2}$  inches long for the 220-Mc. band. Fortunately, the driven elements can be tuned to resonance by a short stub, and the main transmission line tapped across this stub at the proper point for impedance matching. There is, therefore, no critical length for the driven elements in



such a system. Where two such 3-element bays are used a single stub can be used to resonate the entire system.

In certain arrays or with Yagis spaced a half wavelength apart, there is a bucking action of directors of one bay upon those of the other. Reflectors spaced a half wave apart aid slightly in the forward gain of a beam, especially in a 4- or 8-element design. Directors, on the other hand, tend to cancel each other's gain when used at half-wave spacings between bays. It was found that  $\frac{5}{8}$ - to  $\frac{3}{4}$ -wavelength spacing minimized this effect when two directors were used, but  $\frac{5}{8}$  wavelength was not sufficient spacing for two bays having four directors each in a broadside beam, in tests at W6AJF. A 2-meter vertically-polarized beam of this type had a very sharp front lobe, with large side lobes and less than expected forward gain. When the two 6-element Yagis that made up this array were cut apart and stacked vertically, a considerable improvement in forward gain resulted, and there was a marked reduction in the side lobes.

### One Director for Two Driven Elements

In stacking the 3-element design shown in Fig. 1 the director current maximum points are spaced about a wavelength apart, so there is no

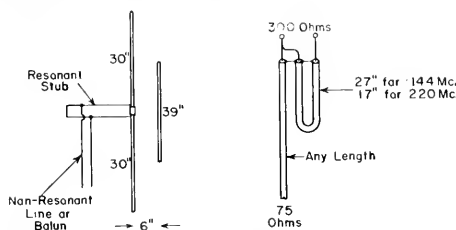


Fig. 1—A single 3-element 2-meter array having shortened driven elements and one director. Gain of this system is 7 db. A balun for use with coaxial line is shown at the right.

appreciable cancellation. A broadside spacing (in vertical arrays) of about  $\frac{3}{4}$  wavelength (60 inches at 2 meters) seems a good compromise value as regards amplitude of side and back lobes.

The idea of using a single director with two driven elements, as shown in Fig. 1, was developed by Ralph Bykerk, W6YSD. Tests on 220 Mc. proved that actually more gain could be obtained with one director than with two, when using two half-wave driven elements, because of the close end-to-end spacing of directors when two are used. Gain measurements at 145 and 221 Mc. showed 7 db. gain with this simple 3-element beam, and front-to-back ratios as high as 30 db. Six-element beams of the type shown in Fig. 2 gave maximum values of 11 db. forward gain, with an average of 10 db. over the whole 144- and 220-Mc. bands.

The two driven elements were originally cut to 38 inches (for 2 meters) but a reduction of the radiating portions to 30 inches did not reduce the forward gain because the two current points were

moved down behind the director. Apparently, the gain of this arrangement compensated for the reduction in field strength, from the driven elements alone, when their current maximum points are brought to less than a half wave apart.

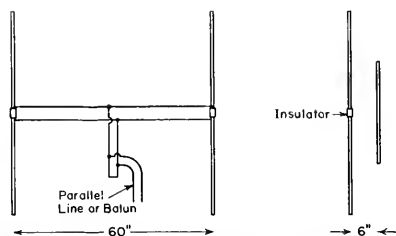


Fig. 2—Two 3-element arrays for 144 Mc. may be connected about  $\frac{3}{4}$  wavelength apart to make a 6-element beam having a gain of 10 db. or better.

The shorter driven elements require a longer tuning stub for the whole beam.

One 6-element array, shown in the photograph, uses 300-ohm Twin-Lead for all portions of the feed system. The driven elements are half-inch aluminum tubing 31 inches long, mounted on  $\frac{7}{16}$ -inch canvas bakelite insulators. The latter have short aluminum sleeves over them where they pierce the 1-inch mounting booms, leaving an insulation gap of about  $\frac{1}{2}$  inch on each side to the two driven elements. The main boom is 1-inch aluminum tubing 5 feet long, so the distance between the elements is 58 inches. The short booms on which the directors are mounted are 7 inches long, to allow a spacing from the driven elements of 6 inches. The directors, being mounted at their electrical centers, are not insulated.

The phasing line of 300-ohm Twin-Lead is not transposed. For this particular antenna the tuning stub was 32 inches long, with the 300-ohm feeder tapped up 3 inches from the shorted end. For test purposes, a balun was used at the feed point to step this impedance down to 75 ohms for connection to 75-ohm coaxial transmission line to the transmitter. Extreme care must be taken to maintain exactly equal line impedances and power input to the lines when comparing a beam with a standard dipole antenna for relative forward gain figures. These conditions are most readily met when coaxial line is used.

Another 2-meter 6-element beam was made with open-wire feeders. In this case the directors were 39 inches long, of  $\frac{1}{4}$ -inch diameter, mounted 6 inches in front of the driven elements, as before. The latter were 30 inches long, of the same material. End insulators were of fiber bakelite tubing,  $\frac{1}{2}$ -inch o.d. and  $\frac{1}{4}$ -inch i.d., to take the driven elements. This particular model had 54-inch spacing broadside, instead of the preferred value of about 60 inches. The tuning stub of open-wire line turned out to be 43 inches long, with the main transmission line tapped at 6 inches from the shorted end. The length of the stub should be adjusted for resonance at the band

(Continued on page 128)

# The "Tiny Tim" Portable

*A Complete Dry-Battery Station for 40 and 80 C.W.*

BY STUART D. COWAN, JR.,\* W1RST

• Here is a little item that many hams will like to have around the shack, since it has a variety of uses. The unit, which includes transmitter, receiver and battery power supply, has been variously used by the author in the field, on a boat, and in the home station for the thrill of operating real low power.

**W**EIGHING in at 18 lbs., "Tiny Tim" is a complete ham station in one compact case, for use in emergencies, portable operation on land or sea, or in your regular station for the thrill of real low-power work (or when the power fails).

"Tiny Tim" has been operated from my 19-foot Hurricane-class racing sloop on Long Island Sound, from my home location, and in the field. The little rig performs amazingly well considering its 2 watts of transmitter input. On 3510 kc. one Sunday night, a W4 and W2 were hooked on one call in a mountain of QRM. Signal-strength reports are nothing to write

home about, but almost solid QSOs are possible in most cases. The thrill of contacts with true low power is something you know only after you've tried it. And, *building* a rig, for a change, is good for many of us who sometimes lose sight of the values that made ham radio what it is today.

The rig is built in a steel utility cabinet 8 inches deep, 11 inches wide, and 12 inches high (Bud C-881). Two shelves, 5 by 8 inches, were cut from sheet aluminum. After bending one edge to permit bolting to the panel, each shelf ended up 4½ by 8 inches. The whole rig can be easily removed by disconnecting the batteries and unscrewing the front panel.

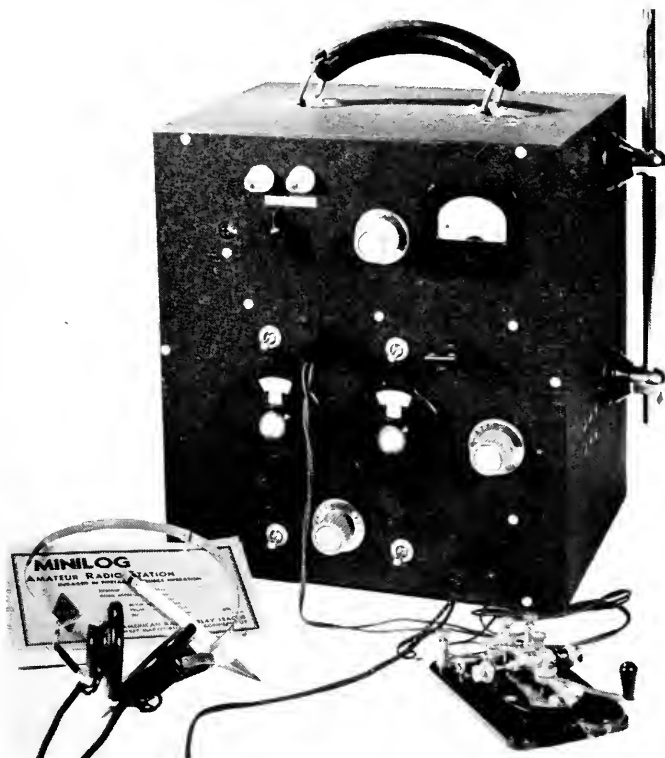
## The Receiver

The receiver is a simple regenerative type with a single stage of audio, but it works well. With a good antenna, strong signals pound in and you sometimes use the volume control which normally is wide open. Selectivity, of course, is not the best but good bandspread helps a lot.

While one coil to cover both 40 and 80 can be wound, two coils are recommended for maximum

\* 45 Park Ave., Old Greenwich, Conn.

The "Tiny Tim" with 'phones, key and crystal plugged in ready to go. The receiver is on the bottom and the transmitter at the top. The dial to the left is for the bandset condenser, the one to the right for bandspread tuning. The knob in between is the regeneration control, and the one to the right is the audio gain control. Above, left to right, are the indicator lamp, antenna terminals and switch, transmitter tuning control, and the meter. The four toggle switches are in the battery circuits. The holes at the right and on top are for ventilation.





S<sub>1</sub>, S<sub>2</sub> — Toggle switch.  
T<sub>1</sub> — Interstage audio transformer.  
Batteries — 4.5-volt — RCA VS-028; 3-volt — Burgess F2BP; 45-volt — Burgess Z30XX; or equivalents.  
All capacitances in  $\mu\text{f}$ . All fixed condensers mica.  
Coils wound on 1-inch-diameter 4-prong forms (Millen 45001).

Label all battery leads with small pieces of paper fastened to the leads with Scotch Tape.

***QST* for**

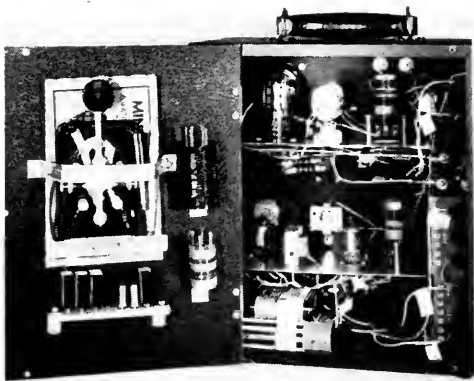
burn out, so you will want to have a 7-8-volt bulb handy.

Next to the bulb is the 3-position switch,  $S_1$ . When the switch is turned to the left to receive, the antenna is connected to the receiver. When the switch is in the middle (transmit) the link,  $L_2$ , is connected to the antenna. With the switch in the right-hand position (test) and the antenna terminals shorted, the tuning bulb is placed across the link and will light brightly when the transmitter is oscillating. With the short removed from the antenna terminals and the switch still in the test position, the bulb is in series with one leg of the feeders. Tune the condenser for maximum radiation (brightest bulb). Now that the antenna is taking the load, switch to transmit, which removes the bulb from the circuit and you're in business.

### The Antenna

The antenna is the key to success with low power (and with high power, too). So far, three antennas have been used with "Tiny Tim":

1) A 4-section automobile radio antenna (Ward SC-8) is mounted on the side of the cabinet (the whip can be pulled out easily, the mountings removed and the holes plugged with bezels, when desired). This antenna is base-loaded, using a coil  $2\frac{1}{2}$  inches in diameter with about 45 turns of No. 14 wire, and is worked against a ground consisting of four wires, each 10 feet long, joined like the spokes of a wheel, at 90 degrees to each other, pegged to the ground. The ground connection is to the junction of these radials. Better counterpoises are described in the ARRL *Handbook*, but this one works well. The advantage of this antenna is that it is easy to disconnect and pack up in a box. It is not very efficient for receiving or transmitting but it works. A center-loaded or top-loaded whip would increase efficiency but would not telescope into a short length like this does.



The rear panel of the cabinet is cut and hinged to permit easy bandchanging. Spare coils, key, crystals, as well as log and pencil, are stowed in racks inside the door. The three transmitter batteries are at the upper right, and the receiver batteries are below. Aluminum straps hold the batteries securely in place.

2) The stainless-steel rigging on our 19-foot sailboat was connected to one side of the link and worked against a  $4\frac{1}{2}$ -foot bronze center-board in the water. The loading coil and a series condenser were ready but not needed. This antenna, again, is not very efficient, but was the best possible under the often hectic conditions and limited space in a small sailboat!

3) The best antenna, by far, is one 136 feet long, as high as possible and in the clear. A good portable antenna can be made from solid copper trolling line, with nylon fishing line as combination insulator-halyards. A 72-ohm receiving-type line can be used as the feeder. This antenna can be rolled up on a light wooden reel, and works well.

Any antenna and antenna loading method can be used with "Tiny Tim" but the higher the antenna, the better the results. The rig could

(Continued on page 130)

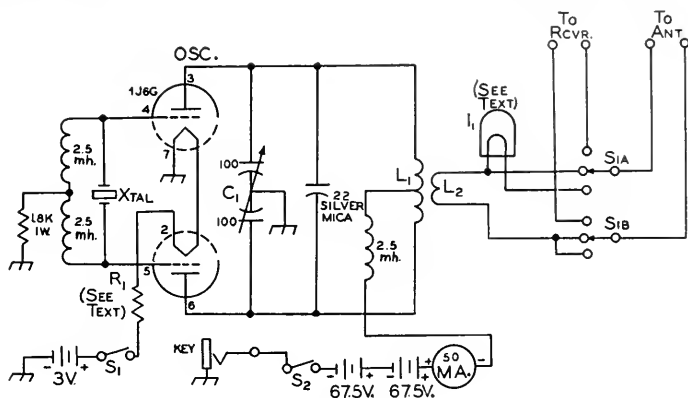


Fig. 2 — The "Tiny Tim" transmitter circuit.

$C_1$  — Hammarlund HFD-100.

$L_1$  — Wound in two sections, with  $\frac{1}{4}$ -inch space between sections.

80 meters — 19 t. No. 22 e. each section,  $1\frac{1}{2}$ -inch diam., close-wound (1CA 2159 5-prong form).

40 meters — 12 t. No. 18 e. each section, 1-inch diam., close-wound (Millen 45005 5-prong form).

$L_2$  — Wound in space between sections of  $L_1$ .

80 meters — 4 turns No. 18, close-wound.

40 meters — 3 turns No. 18, close-wound.

$S_1$  — Rotary ceramic.

Batteries — 3-volt — Burgess F2BP; 67.5-volt — RCA VS-216; or equivalent.

# Emergency Power Distribution

## *Preparing for Field Day and Emergencies*

BY GERALD T. WHITE,\* W1WUJ

**I**N the rush of preparing for Field Days — and especially emergencies — little thought is given to a.c. power distribution beyond getting a generator and plugging in. The associated twisted bare connections, multiple cube taps, absence of fuses, and so on, not only make for lack of reliability but also create a personal hazard for everybody coming near the site.

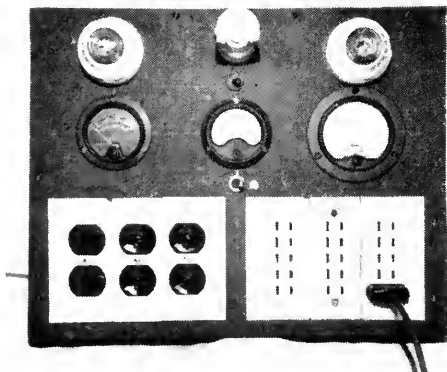
Invariably, not enough electrical fittings are brought along, so off come more plugs and more twisted connections are made, only to come apart in the middle of a QSO. With no fuses in the circuit, especially in multiple-transmitter installations, one short-circuit puts everybody off the air. If the line voltage is in doubt, there *might* be available a multimeter of questionable accuracy (probably not having been used to read 115 volts a.c. since last Field Day). After poking the prods in the nearest spare outlet, they are usually left there to “monitor” the voltage. Only with luck will they fail to fall together and short.

After reviewing the situation it was decided to plan the a.c. power distribution system for the June, 1954, Field Day. The problem divided itself into three major categories: (1) generator, (2) feeder layout, and (3) feeder termination.

### **Generator**

The first problem, the generator, requires careful consideration. Both single- and three-phase generators are generally available. The most desirable generator is one with single-phase output, especially 220 volts center-tapped.

\* Lieut. Cmdr., USN, FAW-3 staff, NAS, Quonset Point, R. I.



W1WUJ's a.c. distribution panel includes the accessories mentioned in the text and serves as a useful piece of station and shop equipment in the interim between Field Days.

However, many c.d. groups may fall heir to military-surplus 3-phase 110-volt units, and these can be used if a few precautions are observed.

Maximum output should not be drawn from either a 220-volt single-phase center-tapped generator or a 110-volt 3-phase generator unless each leg is equally loaded. If multiple transmitters are placed on separate legs, the line-voltage fluctuations caused by transmitter keying are greatly reduced.

The engine governor should be adjusted to not less than 55 c.p.s. line frequency under full load. If it is set for 60 c.p.s. at no load, the frequency may drop to well below 50 c.p.s. under load and damage to equipment may result. The smaller generators are particularly susceptible to this fault. A 60-cycle electric clock can be used to check the line frequency if a regular frequency meter is not available. If the clock second hand covers much less than 50 seconds in a minute, look out! Almost all ham electronic equipment will operate properly above 60 c.p.s.; however, 60-cycle generators should not be pushed to much over 75 c.p.s. or the engine bearings are likely to be damaged under the prolonged excessive speed.

### **Power Distribution**

The second problem, feeder layout, should also be given careful thought. No fuses, switches, or ammeters should be placed in any wire that is common to two or more branch circuits. One side of each circuit should be grounded, if only by a short rod in moist earth, to help prevent shocks and to reduce the explosion hazard when gassing and servicing the generator. (People *will* attempt to service them while they are running!)

In a 3-phase Y-connected system, the common connection should be grounded. In a 3-phase delta fully-loaded system, one phase must have both sides above ground, so pick one fall guy and let him plan accordingly. However, if only 5 k.v.a. is required from a 7.5 k.v.a. generator, then there is no problem: just ignore one phase and use the junction of the other two phases as common and ground. It should be determined ahead of time which phase is regulated, and this phase should be used for the average (or heaviest) load and the line voltage adjusted accordingly to prevent excessively low voltage or equipment burnouts.

A fuse should be inserted in the “hot” wire of each feeder pair leaving the generator. These fuses should be only a little larger than each station needs, and the total fused current should not exceed the generator capacity. Each trans-



mitter site should have a separate feeder direct to the generator to reduce voltage drop, variations, outage, etc.

All transmitter, receiver, and other chassis at each site should be wired together and grounded. This will avoid r.f. burns and prevent the annoying tingle from the a.c. line by-passes found in most commercial equipment.

A source of adequate a.c. feeder cable is always a problem. Coaxial cable that is too old to be of further value in r.f. service makes excellent feeder cable. For high currents, connect the inner and outer conductors together and run two cables for the two conductors.<sup>1</sup>

### Terminal Facilities

The last, but equally important, problem is feeder termination. The receptacle panel should

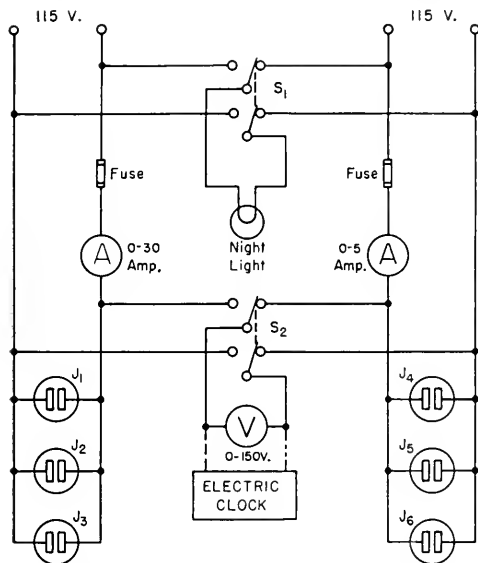


Fig. 1—Receptacle panel wiring. The number of outlets may be increased as desired.

contain at least eight outlets, protected by a fuse and monitored by a panel-type a.c. voltmeter, and a small night light. An a.c. ammeter is also desirable to help equalize loads on the generator. A frequency meter or an electric clock may be mounted on the panel so it will be available.

It will be noted in Fig. 1 that the night light is connected ahead of the fuses while the voltmeter is connected after the fuses and ammeters. This provides for instantaneous indication as to whether the local fuse blew, the ammeter opened up, or whether the main power failed.

Fig. 1 also shows two separate busses, in

<sup>1</sup> Feeder voltage drop can be estimated quickly by remembering that there will be one volt drop per ampere per 100 feet in a conductor having an area of 1000 circular mils. The drop is directly proportional to current and length, and inversely proportional to circular mil area. The center conductor of RG-8/U (5670 c.m.) would have a drop of 1 volt per hundred feet at a current of 5.67 amp. In a go-and-return circuit (two wires) the drop should be figured on the total wire length, of course. — Ed.

• It isn't too early to be getting ready for Field Day — and, of course, never too early to be getting ready for emergency operation. Planning for adequate power control and distribution is too often overshadowed by radio-equipment problems. Here are some ideas — many of them directly applicable to your own set-up, no doubt — that should stimulate constructive thinking and action.

anticipation that adequate cable would not always be available. One bus, with three duplex receptacles, is designed for a maximum of 30 amperes for transmitters, lights, and accessories. Under these circumstances, two separate pairs of feeders would be brought to the panel from the generator, thus providing better regulation for voltage-sensitive equipment. The two busses could be paralleled when satisfactory feeders are available. If fuses are provided at the generator end of the feeder, it will be desirable to insert smaller fuses at the receptacle panel than at the generator, to prevent blowing two fuses when a short circuit occurs.

It is not necessary to use expensive meters. There is at least one type of inexpensive meter on the market that is well-damped and is quite satisfactory.

The "quintet"-type receptacle, providing space for five flat or three round a.c. plugs, is far better and safer than using duplex receptacles with cube taps.

Besides its Field Day and emergency applications, the receptacle panel will be a most useful addition to any home workbench since it has adequate outlets and meters to service modern electronic equipment properly.

It is the author's belief that it is always better to do as much as possible in the home workshop before Field Day or an emergency and thereby avoid frustrating work under difficult conditions in the field.

## Strays

In Yosemite Valley, Calif., a ritual called the "fire-fall" is held nightly. A huge bonfire is pushed over a cliff located near Camp Curry. Before the ceremony, scores of blinking lights signal the group on top of the cliff.

W4NQD sent a "light" CQ from the fire area. He was answered from the valley by W9NDM/6 and W9ORY/6. Returning home, W4NQD confirmed by sending QSLs to the stations. Responses were:

To W4NQD/6: confirming our 5 X 10<sup>-9</sup> Mc. communication at 8:30 P.M. PST. Pwr: 0.3 watt. Xmtr: souped-up 2-cell air-cooled portable flashlight. Rvtr: 2 photosensitive receptory organs. Ur sigs RST 599. — W9NDM/6

Tnx W4NQD/6 for fine QSO on 6500 angstroms. Xmtr: 1-watt thermal resistor (flashlight). Rvtr: dual optic. Conds: excellent. Ant: 2-inch diameter parabola. — W9ORY/6

# Ferroxcube Cores and a High-Selectivity I.F. Amplifier

## *Design Notes and Suggestions for Improved Receiver Selectivity*

BY J. S. BELROSE,\* EX-VE7QH, EX-VE3BLW

• If you follow receiver design and improvements, you will be interested in this account of a new inductor-core material that can be easily used by the amateur. Several possible circuits are described, as well as the practical design data for a high-selectivity 20-ke. i.f. amplifier.

WITHIN the last few years there has been considerable interest in the development of the ideal communications receiver. The progress made toward this goal can be readily seen if one traces the development of commercial communications receivers during the past nine years.

The trend in receiver design has advanced from the simple but effective regenerative i.f. amplifier (single-signal superhets so popular in the prewar ARRL *Handbooks*) to the complicated triple-tuned and quadruple-tuned low-frequency i.f. amplifier of the present day. The mechanical filter (or magnetostriction filter) has recently been developed, and it provides an opportunity to obtain a maximum skirt selectivity and quite narrow bandwidths with a minimum number of stages. And, of course, we still have our old stand-by, the crystal filter. However, very high- $Q$  selective  $LC$  filters can be designed that will provide a maximum receiver selectivity and which can be easily constructed by the amateur radio designer.

Several excellent articles have appeared in *QST* on selective amplifiers.<sup>1,2,3</sup> The purpose of this article is to collect together some practical data, which the author has accumulated during the last few years of experimental receiver design, and to present these data in the form of notes for the amateur who prefers to build his own receiver. And, together with some simple circuit theory, an amplifier will be designed that has an extremely narrow bandwidth and excellent skirt selectivity. In conjunction with a good r.f. tuner, this amplifier will outperform any receiver which is at present commercially available. The recent advances made in the development of low-loss ferromagnetic-cored materials for high- $Q$  induc-

tors have made coil design and construction a pleasure, and they inspired the author to write this article. Since the heart of the amplifier is the highly-selective filter, it is necessary that a good portion of this article should be devoted to a general introduction to the use of these core materials.

### *General Considerations*

In the design of a communications receiver for radiotelegraphy, it is the author's opinion that a good receiver should be a double-conversion superhet and that the second i.f. should be as low as possible, in order to achieve the required selectivity and stability. Low-frequency amplifiers can readily be designed that have noise figures near to unity but, in any case, the over-all noise figure of the receiver is decided in the first stages, so this factor will not be considered here. Two stages of 455-ke. amplification should be provided to avoid image problems with the low second i.f. The 455-ke. signal should be fed to the second mixer at low level by means of a cathode follower. The signal-handling capacity of the stages before the narrow-bandwidth stages should have sufficient dynamic range to avoid cross-modulation distortion by strong adjacent-channel signals.

Operators not used to copying signals received through a very narrow bandwidth will find that this new experience requires some learning. The familiar ring of a keyed signal, so characteristic of a very selective crystal filter, is considerably reduced by the use of very selective bandpass coupled circuits. Hence, narrower bandwidths, for the same degree of ring, can be used. These circuits are in general designed to produce an optimum flat-top amplitude response. For signaling speeds of 20 w.p.m. and less, the keyed signal sounds clear and with little ring in a 30-cycle bandwidth, except under conditions of great interference of an impulse nature as, for example, local thunderstorm conditions. As the bandwidth is reduced below 20 cycles, the Morse characters start to run together and the information capacity of the channel approaches zero, as the bandwidth approaches zero. (The power required to transmit reliably a given rate of information approaches infinity.)

In the circuit design to follow, an amplifier bandwidth of 100 cycles is chosen because this bandwidth is easily obtained with presently-available circuit components. Additional narrow-band audio-frequency filters can be used if necessary after the signal is tuned in. The over-all circuit stability (from transmitter to receiver) re-

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<sup>1</sup> McLaughlin, "Selectable Single Sideband," *QST*, April, 1948.

<sup>2</sup> Githens, "Super-Selective C.W. Receiver," *QST*, August, 1948.

<sup>3</sup> Goodman, "All-Purpose Super-Selective I.F. Amplifier," *QST*, May, 1953.

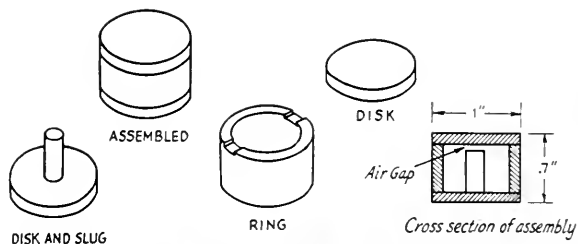


Fig. 1 — Component parts and assembled pot core (Ferroxcube D-25/17.5).

quired for operation with a 100-cycle filter is such as to require fine vernier action for the h.f. oscillator control, in order to "hold" the signal in the passband.

### Ferroxcube Pot Cores

If an air-wound coil is placed in a medium of permeability  $\mu$  times that of air, the self-inductance  $L$  will also be increased  $\mu$  times. Since the copper losses remain constant, the  $Q$  of the inductor will be increased. The resultant increase of the quality factor will depend on the additional losses introduced into the coil by the core. These losses may comprise eddy-current losses, hysteresis losses, and residual core losses. Recently, great advances have been made by manufacturers in producing ferromagnetic materials which introduce very small losses. Ferroxcube III is a low-loss manganese-zinc ferrite with a cubic crystal structure. The metal oxides are extruded in the form of a plastic mass and fired at a high temperature; the result is a material of extremely high resistivity and having mechanical properties which resemble porcelain. This material has many uses and is formed into quite a variety of component shapes. The "pot core" is a specially-designed form developed for very high- $Q$  coils as used in bandpass filters in carrier telephony and i.f. coils in radio engineering. As shown in Fig. 1, the pot core<sup>1</sup> consists of a ring, two disks, and a slug. The slug is slightly shorter than the ring, leaving an air gap in the otherwise closed magnetic circuit. The copper windings are wound on a small plastic bobbin. Since the turns are entirely surrounded by a material of high permeability, excellent shielding is provided, and coils can be placed quite close together without causing undesired coupling. The pot-core assembly can be bolted directly to the metal chassis

without affecting the  $Q$ . The effective inductance is slightly increased by grounding the core, since the distributed capacity effects are changed. However, this is only of the order of a few  $\mu\text{f}$ . The upper frequency limit for Ferroxcube tuned inductors is about 500 kc.

### Application of Pot Cores

If the tuned filter is to be used as the load impedance of a tuned amplifier, some special considerations are necessary in order to insure maximum stability for the inductance. With Ferroxcube, the permeability decreases (i.e., the inductance decreases) as a result of d.c. flowing through the windings and causing premagnetization of the core material. Another factor to consider is the low saturation properties of Ferroxcube. Therefore, if the sharply-tuned filter coil is included directly in the anode circuit of the output valves of the amplifier, where the anode current is likely to change with the signal voltage, the effect is to detune the filter and increase the bandwidth. The simplest method of reducing these effects is to tap the plate quite a way down on the inductor, so that the d.c. current flows through only a few turns of the coil. This results in additional advantages, since it reduces loading of the tuned circuit by the plate resistance of the valve, and provides a convenient means of reducing the stage gain. (The stage gain can become rather too high as a result of the large inductance values needed to tune to low frequencies with convenient sizes of tuning capacitors.)

The other important consideration for a coil wound on a magnetic core is the temperature coefficient of the core material. Because of the low Curie point (the temperature at which the permeability becomes practically unity) of Ferroxcube materials, the permeability of the material is quite temperature-sensitive. Since the inductance varies directly with the permeability, its temperature coefficient will be identical with that of the core. This temperature coefficient can be inadmissibly high for coils used in narrow-band sharply-tuned filters. The influence of the core material on the inductance must be de-

<sup>1</sup> Manufactured by Ferroxcube Corporation of America, and Philips' Industries, Eindhoven. Obtainable in Canada through Rodgers Majestic; in Great Britain through Mullard Components Division, and in the U. S. A. through Ferroxcube Corp., 97 Marshall St., North Adams, Mass.

Ferroxcube pot cores make it possible to build high- $Q$  inductors for "super-selective" i.f. amplifiers. The component parts and a complete assembly are shown here.



creased, and this is achieved by providing an air gap. In general, there is an optimum air-gap size for a given  $Q$ . In some cases, especially at low frequencies, it is desirable to choose an air gap larger than optimum for a given  $Q$ , in order to increase the stability of the coil. A larger air gap also reduces premagnetization effects. Therefore, the largest air gap for the given  $Q$  should always be used. As a general rule, the higher the frequency the greater the optimum size of the gap. For gaps larger than 0.5 mm. the core should be symmetrically located, leaving half the total tap at each end.

For frequencies less than about 30 kc. the best  $Q$  is obtained by winding the coil with solid enamel-covered wire (not silk-covered), with the

selectivity, and off-channel response. The stage gain should be kept low, to avoid trouble with oscillations caused by the difficulty of decoupling the stages at low i.f. frequencies. Single-tuned circuits are not recommended for use in the i.f. amplifier because they give a comparatively narrow passband and poor attenuation outside the passband (a crystal is a very high- $Q$  simple circuit). Capacitance or inductance coupling between two tuned circuits may be used to give a bandpass selectivity curve with good attenuation outside the passband. The coupling impedance may be in shunt connection, the so-called common coupling, or it may be in series, the so-called top-end coupling. Four common types are illustrated in Fig. 2.

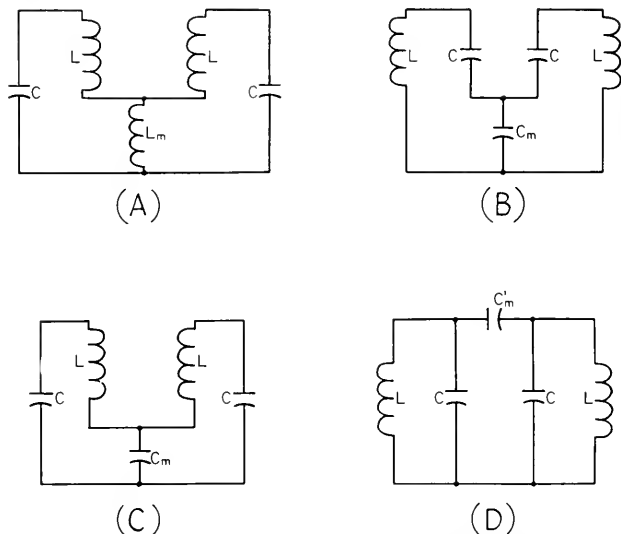


Fig. 2 — Four common types of coupled circuits. A, B and C illustrate shunt coupling, and D is a form of series coupling.

wire size chosen to fill the available winding space for the particular value of inductance required. For frequencies above 30 kc., and most certainly for frequencies between 100 and 500 kc., the best  $Q$  is obtained by using litz wire. The number of turns required depends on the length of the air gap, since the effective permeability is a function of the air-gap size. For a given pot core and a given gap size,

$$N = \alpha \sqrt{L}$$

where  $L$  = inductance, mh.

$N$  = number of turns.

The factor  $\alpha$  is quoted by the material manufacturer, and inductors wound with the number of turns specified are generally within a few per cent of that required.

### Circuit Design Notes

Narrow bandpass filters will be discussed briefly in this section. In amplifier design the desired parameters are stage gain at resonance,

<sup>5</sup> Sturley, *Radio Receiver Design*, Chapman Hall, 1953, p. 443.

All of the methods of coupling shown in Fig. 2 give somewhat similar selectivity response curves near resonance (for near-to-critical coupling). The common inductance type, Fig. 2A, is superior for coupling that is slightly greater than critical, since both peak frequencies (of the double-humped response curve characteristic of overcoupled circuits) move away from the mid-frequency as  $L_m$  is increased. The response of this circuit is similar to that for a double-tuned inductively-coupled transformer in which the mutual inductance is equal to the common inductance,  $L_m$ . For the series-type coupling, only one limit frequency is affected.<sup>5</sup>

We next consider the selectivity far from resonance. Circuits of Figs. 2B and 2D are similar. For both these circuits the low-frequency skirt is the steepest obtainable, whereas there is some flattening out on the high-frequency side below about 60 db. down. The response of the circuit of Fig. 2A is somewhat better on the high-frequency side but somewhat worse (below about 80 db. down) on the low-frequency side. The circuit of Fig. 2C has the steepest obtainable response on the high-frequency side but is very much the worst of the lot on the low-frequency side, since the response starts to rise again about 8 kc. off on the low side (for circuit values to be considered later). At 20 kc., component values limit us to the use of the type of coupling shown in Figs. 2A and 2D, since practical values for  $C_m$  are rather high. It can be shown that the coefficients of coupling for these two circuits are

$$k \sim \frac{L_m}{L}, \text{ and } k \sim -\frac{C'_m}{C}$$

In general, the best off-channel response will be obtained by the use of combinations of both these circuits, as in the circuit of Fig. 3. For maximum-flat response, the circuits should be critically coupled; that is,

$$k_c = \frac{1}{Q}$$

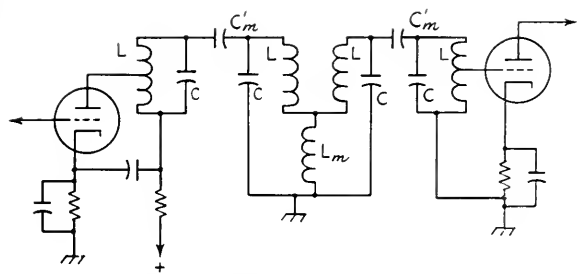


Fig. 3 — Shunt- and series-coupling circuits can be combined for high-selectivity interstage coupling.

With critical coupling, the flat-topped character of the over-all response curve is, if anything, improved when a large number of stages is used. In general, any degree of selectivity, approaching the ideal flat-top response, can be obtained by using a sufficient number of stages and combinations of under-critical and over-critical coupling.

As will be seen later, the anode of the amplifier tube and the grid of the following amplifier stage are tapped down on the inductance  $L$ . This does

not in any way alter the response of the coupled circuits, since for the case considered,  $L \gg L_m$  and  $L \gg L_1$  (Fig. 5). And because the coil is surrounded by a material of very high permeability, the coupling between the two parts of the coil is almost perfect and the circuit approximates an ideal autotransformer, transforming impedance and voltage.

### Practical Circuits

The complete circuit of a practical amplifier is shown in Fig. 4. The 455-ke. signal is heterodyned in the 6BE6 mixer to 20 kc. by beating with a 435-ke. crystal (obtainable from surplus stock) and amplified by a three-stage double-tuned selective amplifier designed to produce a maximum-flat-topped response. The 20-kc. signal is heterodyned to 1 kc. (or whatever audio note is desired by the operator) by beating with a stable series-tuned Clapp-type oscillator. The series-tuned trap in the output filter following the second mixer is tuned to 20.5 kc. to reduce

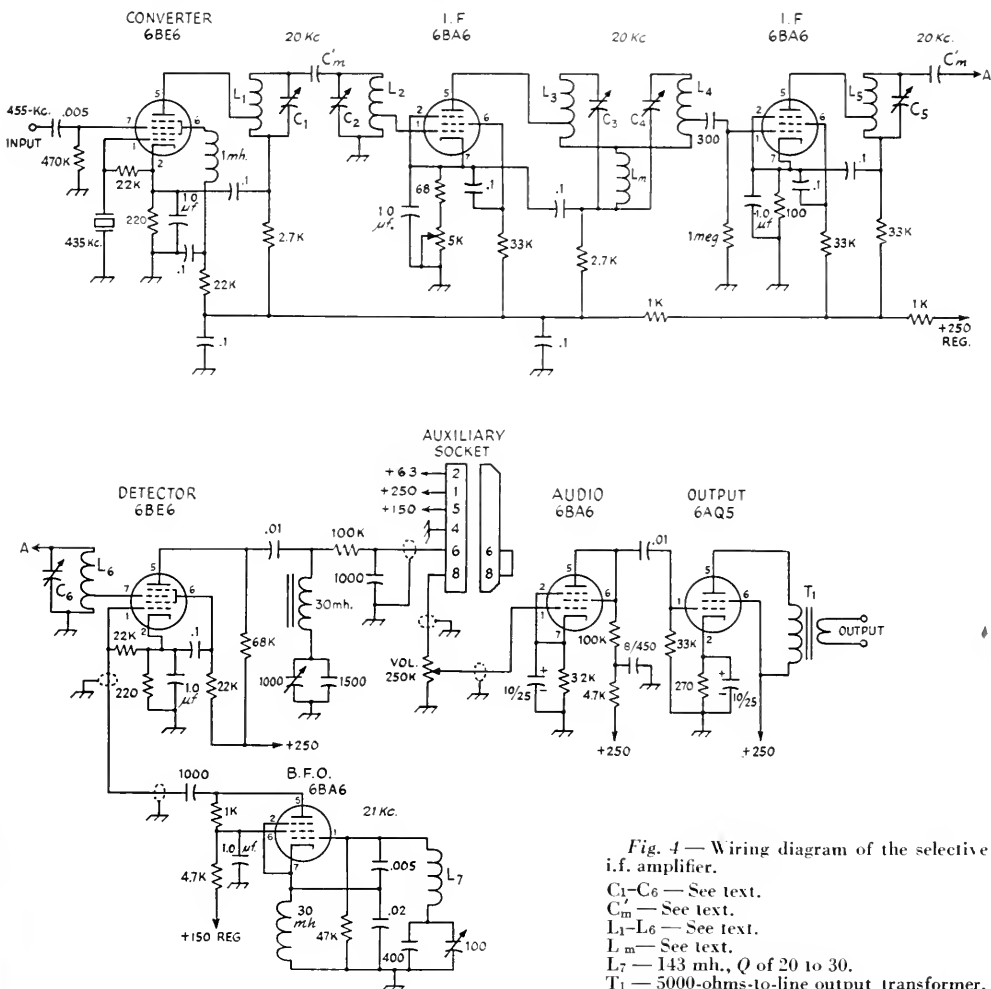


Fig. 4 — Wiring diagram of the selective i.f. amplifier.

$C_1$ — $C_6$  — See text.  
 $C_m$  — See text.  
 $L_1$ — $L_6$  — See text.  
 $L_m$  — See text.  
 $L_7$  — 143 mh.,  $Q$  of 20 to 30.  
 $T_1$  — 5000-ohms-to-line output transformer.

the i.f. and b.f.o.-oscillator signals at the grid of the first audio amplifier. The b.f.o. is tuned to the high side of the signal frequency. An octal socket

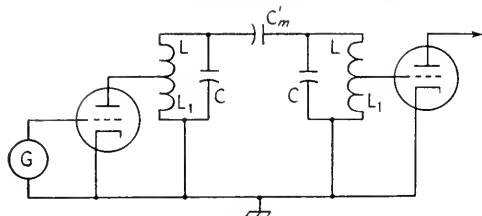


Fig. 5 — Equivalent circuit of an amplifier stage.

is wired so that a Selectoject can be used with the amplifier. When the Selectoject is not in use, an octal plug must be used to jump Pins 6 and 8. Other types of audio filters could also be used. (A double-tuned critically-coupled selective amplifier tuned to 1 kc., with a bandwidth of 30 cycles, has been experimentally used by the author with very excellent results.) The decoupling between stages may look elaborate, but adequate bypassing is quite difficult at 20 kc., where a 0.1- $\mu$ f. condenser looks like 80 ohms. After some experimentation the decoupling shown was adopted as a means of completely isolating the stages so the response curves are as calculated and not as modified by the regeneration introduced by the wiring.

#### Design of the 20-Kc. Tuned Circuits

The gain of an amplifier at resonance is

$$G = g_m Z$$

where  $g_m$  = transconductance of the valve in mhos, and

$$Z = \text{load impedance in ohms.}$$

For double-tuned critically-coupled circuits,

$$Z = \pi f L Q.$$

Now, if the anode of the amplifier and the grid of the following stage are tapped down on the filter, as shown in Fig. 5, the gain is

$$G \approx \left( \frac{L_1}{L} \right) g_m \pi f L Q$$

<sup>6</sup> Pot cores D-25/17.5 have now been superseded by type D-25/16 (i.e., the total height of the assembly is 16 mm. rather than 17.5 mm.). The only important advantage of these new pot cores is that a greater air gap is available than with the older type. The maximum air gap in the former type was 0.5 mm., whereas in the new type 0.85 mm. air gap is available for the Grade IIIB2 material. Grade IIIB1 is recommended for frequencies below 20 kc., whereas IIIB2 is recommended for frequencies above 20 kc. At 20 kc. similar  $Q$ s can be obtained with either type. For frequencies above 100 kc., use Type IIIB3. It is recommended that, if this new line of cores is available, Type IIIB2 with an air gap of 0.85 mm. be used at 20 kc., since this will result in a slightly improved temperature stability (here  $N = 93 \sqrt{L}$ ).

These new cores have not been used by the author, but it is thought that  $Q$ s between 150-170 should be easily obtained, since a  $Q$  of 150 was obtained by the author using a Type 25/17.5 pot core with an air gap of 1 mm. This air gap was experimentally ground by hand. However, it is not recommended that the air gap be altered unless accurate micrometers are available to insure a uniformity of the cores. The material is very hard and brittle, and grinding even a few fractions of a millimeter off the slug is a long, tedious job.

where  $L_1$  = inductance of tapped portion, and  $L$  = total inductance of coil.

This is so because the coefficient of coupling between  $L_1$  and  $L$  is almost unity when the windings are enclosed by a pot core.

Choose  $C' = 0.0035 \mu$ f. (convenient because a 0.003- $\mu$ f. fixed can be used with a 1000- $\mu$ f. trimmer);

then  $L = 18.1$  mh.

For a stage gain of 60 with a coil  $Q$  of 180 and a 6BA6 tube ( $g_m = 4400 \mu$ mhos),

$$L_1 = 1.2 \text{ mh.}$$

For the Ferroxcube type 25 pot core IIIB2 material with a 0.5-mm. air gap (Philips' type number D-25/17.5-11,00 — IIIB2)<sup>6</sup>

$$n = 65 \sqrt{L}$$

where  $L$  = inductance in mh.

Hence, we need a coil of 284 turns of No. 34 enamel wire tapped at 71 turns.

The coefficient of coupling

$$k_c = \frac{1}{Q} = \frac{1}{180} = 0.0055.$$

$$\text{Hence } C'_m = 0.0055 (3500) = 19.4 \mu\text{f.} \\ (\text{use } 18 \mu\text{f.})$$

$$\text{and } L_m = 0.0055 (18.1) = 0.1 \text{ mh.}$$

The coil  $L_m$  is wound on a small form having an adjustable slug. Each transformer assembly is completely enclosed in a sheet-metal box (20-gauge tinned steel) and short wires are brought out to connect to the external circuits. The boxes used by the author are 2 by 3 inches and 2½ inches high. These are easily bent into shape and the corners of the box soft-soldered. Short bolts with the heads removed are soldered in the

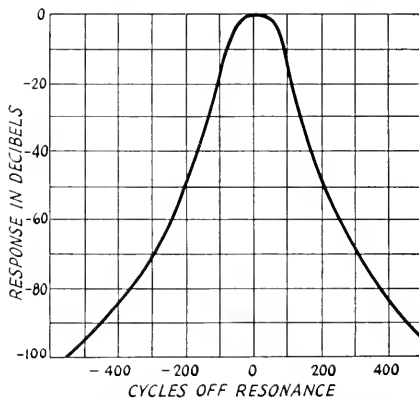


Fig. 6 — Selectivity characteristic of the i.f. amplifier.

corners of the shield box to bolt the assembly to the chassis. The trimmer capacitors are Arco Electric type 307-M padders. These are good for this application because both plates are insulated from the mounting screw and the trimmer can be mounted directly onto the top of the shield box. The trimmer is mounted on the inside face of the top of the shield box, with the slotted bolt for adjustment projecting through the top of the can for ease of tuning. The pot-core assemblies are bolted directly to the side of the shield box.

(Continued on page 130)

## Design for the Electronic-Key Manipulator

### Switching Lever for High-Speed Operation

BY M. A. MESSERSMITH,\* W7DRA

• At the higher keying speeds you have to go from dot to dash in a hurry if you want to turn out tape-like characters. Here's how an army bug was reworked into a high-speed c.k.m.

**D**URING the past few years many excellent electronic key designs have appeared in *QST*, and from these articles amateurs as well as commercial operators have built a number of efficient keys. Listen any week night to one of the fast c.w. amateur traffic nets and you will understand what I mean and what a large number are being used at the present time.

Some years back I built an electronic key from a circuit in *QST* and found it very satisfactory. In the *QST* article it was stated that the difference between operating the conventional style bug and an electronic key was that you operate the bug and the electronic key operates you. I found this to be true.

When comparing regular bug operating with tape transmission you will find the bug has a characteristic style for each individual because each of his hand actions is reflected in his transmission. At high speeds the characters are sharp and not uniform. On the other hand, the electronic key approaches tape very closely and the individual operator's characteristics are not present because, as already mentioned, you have to make your operating conform with the time-constant circuits, and as you coordinate with them you acquire rhythm to conform. Really most of the actual forming of the characters is out of your control — all you control is the spacing between the words and characters. And now we come to our story.

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At a speed of 30 w.p.m. there are approximately 25 time units per second, figuring 5 characters of two dashes and one dot each per word and giving three units to a dash, one to a dot, one to the space between each, and two units between characters. The electronic key will allow you three time units for going from a dash to dot (if the dash is self-completing) compared with only one unit when returning. So you see, in order to keep a good rhythmic style of transmitting at high speed, you require an operating mechanism with fast action and small movement when going

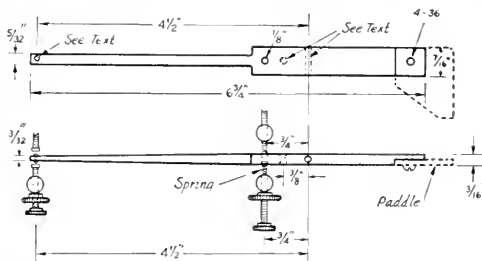


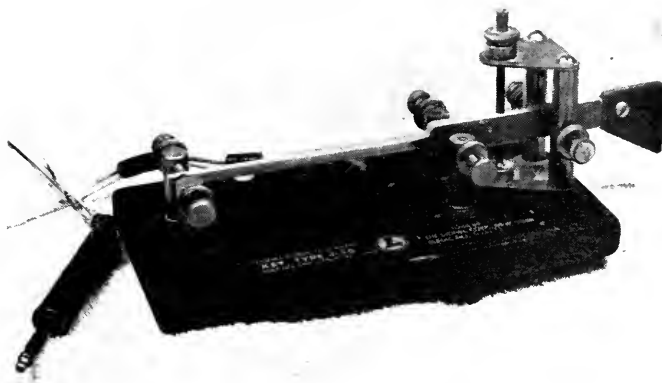
Fig. 1 — Reed dimensions and contact layout. The reed or arm should be made of dural.

from the dot to the dash side, since the available time is only about one twenty-fifth of a second.

I had previously used several different styles of keying devices but was never satisfied with them because as the speed increased it was difficult to keep constant rhythm because of excess motion and play. Keeping the above in mind, a study was made of several styles of keying mechanisms both in operating and on the bench, with the objective of constructing a device having fast action, self centering, and

(Continued on page 146)

Despite the almost microscopic movement of the paddle in going from dot to dash, the arm returns to center without overshoot when released. Practically any "bug" will lend itself to modifications similar to those made in this J-36.





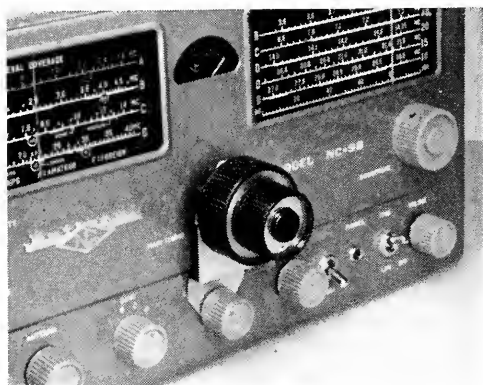
# Communications Receiver Hints for the V.H.F. Man

## Simple Modifications To Improve Results with Crystal-Controlled Converters

BY EDWARD P. TILTON, WIHDQ

ONCE you've used a crystal-controlled converter for v.h.f. reception you'll never be satisfied with less. The stability afforded by crystal-controlled injection has probably been the greatest single factor in the vast improvement in reliable coverage that v.h.f. men have achieved in the last few years. But this has not come about without introducing a few objectionable features along with the benefits.

Spurious responses, for instance are much more troublesome when the i.f. is tuned and the front end of the receiving system is broadbanded.



Fine tuning of the general-coverage dial on most communications receivers can be accomplished through the installation of a vernier drive mechanism. This can be mounted on a plate that can be removed at any time, thus preventing any permanent defacing of the receiver.

And, as many a converter user has found out too late, there are very few communications receivers that have both tuning rate and tuning range adequate for the job of covering a 4-megacycle spread at 7 or 14 Mc.

The problem of unwanted signals has already been treated in some detail in *QST* by Van Dwyne and Treptau.<sup>1</sup> Their discussion was concerned mainly with converter circuit features that help to solve the problem. They showed methods for making the converter response curve flat-topped, with steep-sloping skirts. They also pointed to the need for keeping harmonics and subharmonics out of the energy supplied to the mixer stage from the oscillator-multiplier chain.

After the measures they describe have been taken, if there is still appreciable interference from signals riding through at the first inter-

<sup>1</sup> Van Dwyne and Treptau, "Notes on V.H.F. Converter Design," February, 1953, *QST*, page 52.

mediate frequency, some attention must be paid to the receiver with which the converter is used. Signals at 5 to 20 Mc. are likely to be very strong at times. It is hard to find a 4-megacycle spread anywhere in this region where leak-through won't occur at least part of the time, even with fairly good shielding. But our experiences with TVI have taught us that things that look like shielding and grounding may not actually be doing the job we require.

Take the antenna terminals used on many of today's receivers, for example. Fig. 1 shows a typical arrangement. A small bakelite strip on the back of the receiver has three screw terminals. The first is connected inside the chassis to a ground lug adjacent to the terminal board. The other two are the "doublet" terminals, to be used with any balanced-line feed. When an end-fed or coax-fed antenna is used a jumper connects Terminals 1 and 2, "grounding" them, and presumably also outer conductor of the coax. The inner conductor is connected to Terminal 3. The same arrangement is used when coax from a v.h.f. converter is run to the receiver antenna terminals.

That this method of connection can lead to much i.f. interference, through no fault of the receiver or converter, was discovered recently when a new NC-183D was placed in service at WIHDQ. When propagation was good in the 7-Mc. region, Radio Moscow and the BBC gave us considerable trouble. Other signals around 9 Mc. were almost equally annoying. Yet these signals had been no more than barely perceptible on a rack-model HRO-7 used previously. (The antenna connections on the rack job were inside

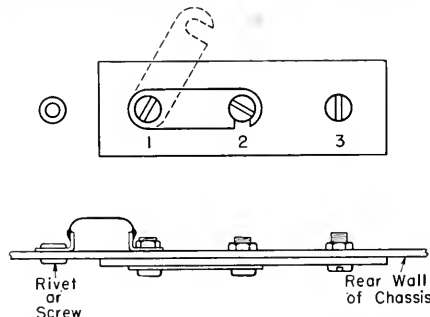


Fig. 1—Three-terminal antenna connection plate used on many receivers. To reduce i.f. pick-up when the receiver is used with crystal-controlled converters, remove the grounding wire from terminal No. 1 and ground externally.

the metal dust cover.) When a converter that used 14 to 18 Mc. was tried, the i.f. interference was intolerable on the new receiver.

Having had some previous experience with this sort of thing, we laid a screwdriver blade across from an exposed bare metal part on the 183D panel to the chassis of the converter. Down went the i.f. QRM! Yet what was wrong with the coax braid, already connecting the converter and receiver chassis? Nothing — except that the connection to the chassis is on the *inside* of the receiver, as shown in Fig. 1. There is no connection to the outside of the chassis, except through the rivet at the left edge terminal. Result: The wire from Terminal 1 to the ground rivet is a nice little coupling loop, and the converter is effectively an “antenna” for signals at the intermediate frequency!

The cure is obvious. Remove the loop connection on the inside of the chassis and make the ground on the outer wall. Use braid or copper strap, so that Terminals 1 and 2 are really at ground potential, outside the receiver.

If you have a very bad i.f. interference problem (like a 40-meter ham running a kilowatt in the next block) you may want to go a step further and shield the antenna terminals. On the NC-183D this was made very easy by the manufacturer; he provided the shield, ready-made, over the speaker terminals. By removing the bottom plate you have ready access to the back of the terminals on the rear wall of the chassis. Remove the short screws that hold the antenna terminal board and replace them with ones about  $\frac{3}{4}$  inch long, with the heads inside the receiver and retaining nuts outside. The shield box can then be mounted over the antenna terminal assembly, outside the chassis, in the same way that it originally covered the speaker terminals. If this doesn't cure your i.f. leak-through problems you need to go over the W2MLX-K2CEM suggestions again.

Of course, the really businesslike way to handle the shielding of the antenna input connections is to install a coaxial fitting on the rear of the receiver, and eliminate the terminal board entirely. The steps outlined above are for timid souls who can't bring themselves to drill holes in a commercial receiver, even in the back. If your receiver and converter are close together, try a strap bond between the two chassis.

And here's an operating hint that helps to reduce i.f. interference. If your converter has an i.f. amplifier, run its gain as high as possible, and the “r.f. gain” on the receiver as low as possible. Where the i.f. pick-up is the result of poor shielding in the receiver this will help appreciably. If the i.f. signals are fed through the converter front end, it will, of course, make no difference.

### What To Do About Tuning Rate?

It's a sad fact of two-dial receiver design that the general-coverage dial chases the kilocycles by just too fast to make for easy tuning of v.h.f. signals. And the bandspread dial never

covers enough tuning range to be of much use, except to the low-edge v.h.f. DX-hound. Single-dial receivers like the HRO, SX62, BC-342, BC-348, SP600JX and SX-73 are somewhat



Vernier drive mounting for using the National type AM dial with the NC-88 and 98 receivers.

better, but only the last three can be said to come close to the ideal in the tuning-rate department.

Some improvement can be achieved by selecting the intermediate frequency according to the receiver's qualifications as to tuning rate. Quite a few two-dial receivers spread out the kilocycles more at the low edge of the various ranges. The SX-71, S-76, NC-88 and NC-98, for example, tune much better at 5 Mc. than at 7. All receivers tune faster on each higher band. The kilocycles go by twice as fast at 14 Mc. as they do at 7.

Nearly all inexpensive two-dial receivers are next to useless for the crystal-converter man; they tune too fast on *any* range. The solution, then, is to slow down the movement of the general-coverage dial, to give us fewer kilocycles per degree of knob rotation. Fortunately, this can be done without making any permanent modifications in the receiver that might impair its resale value or appearance.

The photographs show how this is done. The example is the NC-98, but we've used the same general method on the SX-71, S-76, HQ-140-X and NC-183D with equally satisfactory results. Almost any vernier drive can be used, the first example shown being a Croname type 599 planetary drive. A metal mounting plate can be cut and bent to fit almost any receiver, so no specific dimensions are given here.

Use a volume control nut, a chassis retaining screw, or any handy removable screw or nut that appears on your front panel to hold the plate in place. The “CWO-Manual-AVC” switch mounting nut is used on the NC-98. Cut the sheet aluminum plate to suit your taste, mount the vernier drive in place, and you have a 5-to-1 reduction drive that will give you a tuning rate on the general-coverage dial that will closely

(Continued on page 152)

# A 5-Band Antenna Coupler

## Simplifying the "All-Band" Transmitter Loading Problem

BY LEWIS G. McCOY, W1ICP

A RECENT ARTICLE in *QST* described the construction and use of a standing-wave-ratio bridge.<sup>1</sup> It was pointed out that when the s.w.r. bridge was used in conjunction with an antenna coupler, one could easily match the output from his transmitter to the antenna system. Except for a few special types of antennas,<sup>2</sup> nearly all multiband systems need an antenna coupler to match the transmitter output to the feedline. If one is fortunate enough to have a separate antenna for each band, and each antenna is fed with an untuned, or "flat" (low s.w.r.), line, an antenna coupler is of course not required. However, most of us have to struggle along with a multiband antenna and use a tuned line. The purpose of this article is to describe a coupler that has enough flexibility to match practically any antenna system the average ham can dream up. In addition, for the benefit of the beginner, a few simple antenna systems will be described.

### The Circuit

There are two basic circuits used in antenna couplers: series or parallel tuning. Which circuit is used depends upon the antenna and feedline length in terms of wavelengths. In order to take care of the different conditions one is likely to encounter, an antenna coupler should be designed to use both types of tuning.

Fig. 1 shows the basic circuits that can be ob-

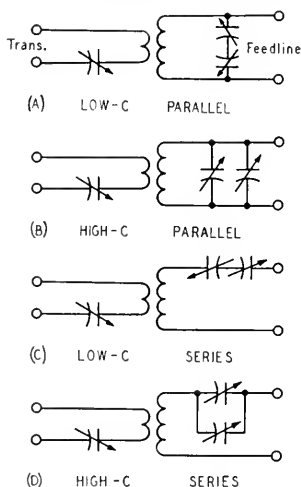


Fig. 1 — In the above drawing, A and B show two parallel tuning conditions: low- or high-C. Series tuning, low- or high-C, is shown at C and D.

<sup>1</sup> McCoy, "Meet the S.W.R. Bridge," *QST*, March, 1955.

<sup>2</sup> Where special matching devices are used to match the antenna to the impedance of the feedline on more than one band.

tained with the coupler to be described. The two capacitors shown are actually one split-stator variable — simple switching takes care of getting the different circuits. A fixed link is used on the coil, but the effective coupling is readily adjusted by varying the capacitor in series with the link.

The practical circuit is shown in Fig. 2. The switching mentioned above is accomplished by

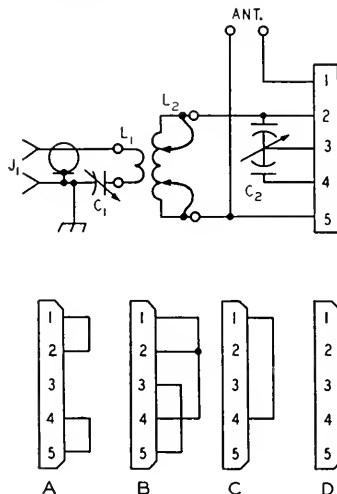


Fig. 2 — Circuit diagram of the antenna coupler.   
C<sub>1</sub> — 320- $\mu$ mf. variable (Hammarlund MC325-M).   
C<sub>2</sub> — 100- $\mu$ mf. per-section variable (Hammarlund HF-BD-100-C).   
L<sub>1</sub>, L<sub>2</sub> — See text.   
J<sub>1</sub> — Coaxial receptacle (Amphenol 83-1R).

plugging in a suitably-connected bar plug — the letters beneath the plugs correspond to the four circuit conditions of Fig. 1. L<sub>1</sub> and L<sub>2</sub> are both mounted on another plug bar — only two coils are required to cover the bands 80 through 10 meters. Intermediate values of inductance are obtained by shorting turns with clip leads permanently mounted on the coil bar, as can be seen in one of the photographs.

### Construction

Although the parts for the antenna coupler might be mounted on a wooden base, we elected to mount them on a 3 × 5 × 10-inch chassis. The condenser spacings and coil wire sizes are adequate to handle powers up to about 500 watts input to the transmitter. Since the Novice cannot run more than 75 watts, the cost of the unit for low-powered applications can be reduced by substituting a smaller capacitor of the same range for C<sub>2</sub>. However, the Novice can build for future high-power days by using components with the

ratings given in the caption, with the assurance that the coupler will work just as well for him as it will for the ham with 500 watts.

The two coils and their links are made from a single length of B & W 3906 coil stock. To make the 80/40-meter coil, first count off 46 turns of the coil stock and cut this piece from the stock. Then unwind one turn from each end. This will provide leads to connect to the jack bar plug. Next, cut the 19th turn from each end, making the cut at the top of the coil (calling the side where the outside leads come off the "bottom"). The ends of the wires at these cuts are separated from the form and brought around to the bottom of the coil. We now have three coils of 18 turns, 6 turns, and 18 turns. The 6 turns at the center forms the link,  $L_1$ . The inside ends of the two 18-turn sections should be soldered together. This gives a coil for  $L_2$  consisting of 36 turns, with the 6-turn link,  $L_1$ , at the center. The leads are inserted in the jack bar plug (Millen 40305) and soldered. The last step is to mount clip leads on the coil ends, so that a portion of the coil can be shorted out for 40-meter operation.

The 20/15/10-meter coil is made up in a similar manner. The original piece of coil stock consists of 14 turns. The completed  $L_2$  has 8 turns, 4 each side of center, with a 2-turn link for  $L_1$ .

No specifications are given for tap points because these points may vary with the antenna system. The coil and shorting bar holders are made from Millen 41305 jack bars.

### Using the Coupler

Let's assume we have a half-wave dipole, 135 feet long, fed at the center with open-wire line. We'll start out first on 80 meters and work down through 10 meters, making notes on each setting of the coupler in order to have a permanent record. As pointed out in the s.w.r. bridge article,<sup>1</sup> one of the best methods for adjusting the coupler is with a bridge. The 80-meter coil is plugged into the unit and the feeders are attached to the antenna terminals. For a start, we'll use plug *B*, which will give us high-*C* parallel tuning. The

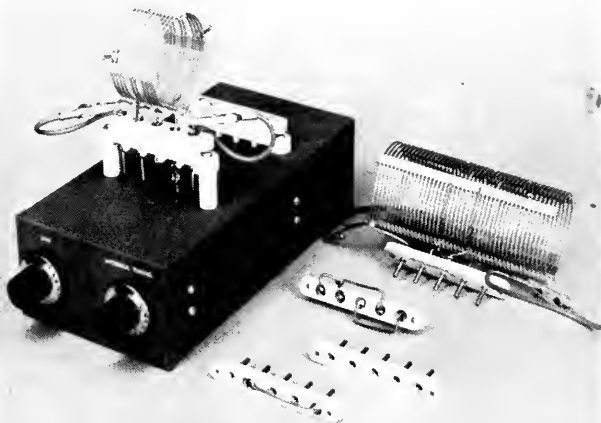
• One of the stumbling blocks among new amateurs is the problem of properly coupling the antenna to the transmitter. A flexible antenna coupler that will handle a wide variety of situations is the solution, and in this article WHCP describes such a device and how to use it. Since it will handle powers up to several hundred watts, it won't have to be rebuilt if and when you increase power.

bridge is connected by coax line to the transmitter temporarily with nothing connected to the output side of the bridge. The transmitter is set up near 3500 kc., or 3700 kc., if you are a Novice license holder, and full-scale reading is set on the bridge meter by adjusting the transmitter output or excitation. The coax line from the coupler is then connected to the output side of the bridge. The controls on the transmitter are left as they were for this particular frequency setting.

The two condensers,  $C_1$  and  $C_2$ , are then tuned for a null indication on the s.w.r. bridge meter. It should be possible to get a reading of zero or very close to it. If a good null isn't obtained, try the other plugs, starting with *A* and working through *D*. It may be necessary to tap in toward the center of the coil, but keep the taps as close to the coil ends as possible. Once a good null is obtained, mark down the settings, because as long as the same antenna system is used, the settings will remain the same. The procedure outlined above can be made for each 25 kc. throughout the 80-meter band, noting the settings at each spot frequency. In this way, one can quickly change frequency and always be sure the system is tuned on the button.

For 40 meters, the same procedure is followed, except that the coil is tapped down from the ends until a good null is obtained. With the antenna system used for testing the coupler, the taps were placed at eight turns in from the ends. However, different antenna systems may take different tap

Top view of the coupler with the high-frequency-range coil in place. The shorting-bar assembly is apparent behind the coil. The low-frequency coil and additional shorting bars are shown at the right.



points, so the correct spots must be found experimentally. Always keep the tap points as close to the ends of the coil as possible, consistent with a low s.w.r. Since the turns on the coil are too closely spaced to accommodate alligator clips, clip points can be made from ordinary soldering lugs soldered to the coil at the proper points.

After the 40-meter settings are noted, similar steps can be followed on 20, 15 and 10 meters. The correct settings for the taps are likely to be more critical than for the lower-frequency bands. In addition, it may be necessary to have more than one set of tap points for the entire 10-meter band.

With the procedure outlined above, it is of course assumed that one has an s.w.r. bridge or can borrow one. If none is available, the coupler can be tuned using an output indicator. An r.f. ammeter can be inserted in series with one of the feeder wires and the coupler tuned for maximum output, as indicated by the greatest reading obtainable on the ammeter. This is not as accurate as the bridge method of adjustment, because one cannot be sure the line between the transmitter and the coupler is perfectly matched. Dial lamps in series with the feedline or tapped across a section of line will also serve as output indicators, as

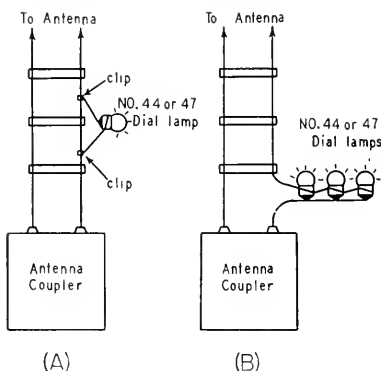


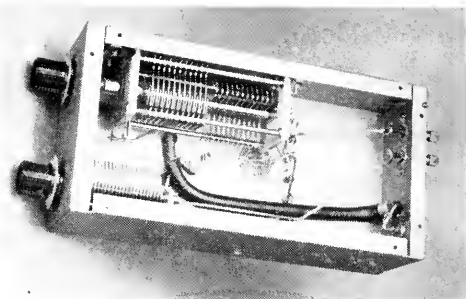
Fig. 3 — Dial lamps serve as an inexpensive output indicator, and either of the two systems shown above can be used. In A, a single dial lamp with one-foot leads is clipped onto the feedline. As the transmitter and coupler are tuned to maximum output, the dial lamp will light up. It may be necessary to move the clip leads up the line to find a point where sufficient coupling is obtained. At B, the dial lamps in parallel are connected in one of the feeders. To start out, all three bulbs should be connected to prevent possible burn-out. They can be disconnected one at a time until the best indication is obtained.

shown in Fig. 3. An absorption-type wavemeter<sup>3</sup> loosely coupled to the feedline can be used.

#### Center-Fed Antennas

A center-fed antenna doesn't have to be a specific length to work well. If you can make the antenna a half wavelength long at the lowest band, fine and dandy. But if your QTH is such that putting up a half-wave antenna would mean tying the far end to your neighbor's TV antenna,

<sup>3</sup>McCoy, "The Baking-Pan Wavemeter," *QST*, February, 1955.



In this view the link capacitor is shown at the bottom and the tuning capacitor at the top. The line connected to the coaxial socket is a short piece of 52-ohm cable.

use a little discretion and compromise with the ideal. A slightly shorter antenna won't show an appreciable difference in performance. The important thing about a center-fed antenna is to be sure that the feedline is connected at the exact center of the antenna and, if possible, that the feedline runs away from the antenna at right angles for a considerable distance. Some amateurs do this by bringing the feedline straight down from the horizontal antenna to a mast or pole and then running the feedline into the shack. The horizontal section of the feedline should, of course, be high enough to clear the heads of any pedestrians.

It is a good idea to make the length of the feedline plus one-half the antenna length a multiple of a quarter wavelength at the lowest operating frequency. A quarter wavelength is found by dividing 246 by the operating frequency in Mc. As an example, suppose the lowest operating frequency is 3.7 Mc.;  $246 \div 3.7 = 66\frac{1}{2}$  feet, so half the antenna plus the feedline would want to be  $66\frac{1}{2}$  (impractical because it makes either the antenna or the feedline too short), 133, or 200 feet long. If the antenna is 100 feet long, half of this is 50 and the feedline should be either 83 (133 - 50) or 150 (200 - 50) feet long. But if these feedline lengths are inconvenient, don't worry about it too much. Put up the antenna you can, with the feedline coming away from the center, and try tuning it on the bands available to you. There are some combinations that turn out to be a little awkward, but the antenna coupler can handle a wide variety of combinations. If you run up against one it can't, try lengthening or shortening the feedline a few feet.

#### End-Fed Antennas

The foregoing flexibility of antenna length does not apply to the end-fed "Zepp" antenna. In this case, if the feedline is not to radiate, the antenna length should be a half wavelength long, or a multiple of a half wavelength. Formulas and charts for these lengths are given in the *Handbook*. However, with the right antenna length, the preceding remarks about tune-up procedure hold, except that the preferred over-all lengths involve

(Continued on page 132)

# QST—Volume III

## Part II† — Foreword to Sumner B. Young's (WØCO) Index

The use of low-powered *spark sets*, operating on wavelengths *below 200 meters*, as a means of QRM avoidance, was a somewhat more practical suggestion; but it is probable that very few amateurs followed it. The main trouble was the lack of *receivers* capable of being tuned down to 100, 150, or 175 meters; and this difficulty was to continue for some time.<sup>21</sup>

An article describing a spark-coil transmitter for operation on 100, 150, and 200 meters (first suggested in a letter published at 26 to 27, October 1919), will be found at 13 to 14, February 1920.

An improved version of a spark-coil transmitter was later described in Volume IV (by Scott) at pages 55 to 56 of the December (1920) issue. Scott operated on 180 meters, and he suggested the use of waves down as low as 100 meters.<sup>22</sup>

In the February (1920) issue, at pages 23 to 24, and 26, there is a very interesting account of the discussions which occurred at the first Boston Inter-Club Convention. This meeting was called by Guy R. Entwistle, and was held on November 20, 1919. (See 14, January 1920.) Among other things, the use of wavelengths of 150, 175, and 200 meters, by spark-coil stations, was recommended.<sup>23</sup>

The editor of *QST* thought well of this idea; and he also suggested that all spark stations drop down to 175 meters, and use reduced power, for local and "moderately short-distance work."<sup>24</sup> [*italics* by S.B.Y.]

The decisions reached at the Boston Conference were referred to, with approval, by Mr. C. A. Service, jr. (Atlantic Division Manager of the ARRL), at pages 19 to 20, in the January (1920) issue.

The most-effective method of dealing with the interference problem, however, was through the use of "time schedules," and rules of operation, enforced by "strong" local or regional clubs or associations.

In this field, the Boston Conference (called by Mr. Entwistle) deserves credit for some wise

decisions; although its recommendations as to the enforcement of its policies were not as practical as those which were later developed in Chicago and embodied in the so-called "Chicago Plan."

At pages 19 to 20, January 1920, Mr. Service stated:

... The Division Manager wishes to mention a movement among the Boston amateurs which has come directly to his notice, that will sooner or later take form as a nationwide movement in all sections and communities where any radio congestion exists. There was a meeting held of representatives of prominent Boston and New England amateur associations. . . . The situation received a general preliminary discussion, the point of view of the spark coil, the experimenter, the relay station and the local amateur being presented and considered and the following tentative remedies being suggested.

1. Central control station for traffic and communication control, to see all have a fair show and no one encroaches on the rights of others.

2. Use of other waves besides and below 200 meters for local work.

3. Elimination of broadly tuned stations and thoughtless or willful interference.

4. Use of minimum power to ensure reliable communication.

5. Time limits for local and long-distance work.

6. Punishment for persistent offenders.

Amateurs from one coast to the other have been thinking this question over for years and the Boston convention is only one example of what other associations have done or tried to do.<sup>25</sup>

There was also some curiosity, on the part of U. S. A. amateurs, as to what kind of results the Canadian amateurs were obtaining, if they were actually using certain short wavelengths prescribed by law for use in certain locations.

At 27, September 1919, the plight of "Our Canadian Cousins" was discussed by E. T. Scholey, of Toronto:

... Perhaps a brief résumé of the Government regulations in Canada would not be out of place. They are rather hard for people living around the Great Lakes, for an amateur station within five miles of a government or commercial station or a

reception, by submarine or subterranean wires, probably has had plenty of attention from Army and Naval experts, recently. But *amateurs* can have little practical interest in such matters. The waves which we use are all too short for such techniques.

<sup>21</sup>Armstrong's superheterodyne, described in the "classic" article at 5 to 9, 15, February 1920, was said to be capable of reception down to 50 meters. See page 5, February 1920. However, these receivers were rarities.

The Grebe type AGP 101 Short-Wave Regenerative, first advertised in *QST* on the inside front cover of the September (1916) issue, was supposed to tune down as low as 150 meters. I suspect this was to allow easy tuning-in of a 200-meter signal.

The Grebe CR-5, CR-8, and CR-9 receivers, as advertised in the fall of 1921, had a bottom tuning range of 150. See 74, September 1921; 78, October 1921; 71, September 1921; and 97, October 1921 — all in Volume V.

At 21, March 1921 (Volume IV), the Clapp-Eastham

† Part I of "QST—Volume III" appeared in March, 1953; *QST*—"QST—Volume I" appeared in October, 1954; *QST*—"QST—Volume II" appeared in February, 1953, *QST*.

[Footnote 20; continued from p. 52, March *QST*]

Re these transmitting experiments, Matthews stated (at 19, July 1920): "... Experiments carried on between the Great Lakes Naval Radio Laboratory and a station in Chicago have shown that signals transmitted on underground wires are equal in intensity to those transmitted on any ordinary aerial, the only difficulty being the tendency of the underground wires to 'ground' when any considerable voltage is applied. For this reason only tube transmitters may be used with any satisfaction, although a low-voltage quenched set was used in these experiments with fair results. . . ."

My guess is that transmission and reception of waves shorter than 600 meters by use of subterranean or submarine antennae are not presently practised. Very-long-wave

route of navigation is restricted to a wavelength of 50 meters for transmission. Up to 25 miles distance the wavelength is 100 meters; seventy-five miles, 150 meters. The power input at the transformer terminals is limited to  $\frac{1}{2}$  kw. . . .

Later, some "relaxation" was allowed:

On December 30, 1919, the Department of the Naval Service, at Ottawa, authorized all Canadian amateurs "on the Great Lakes and River

St. Lawrence, from Port Arthur, Ontario, to Quebec, P. Q., to use a transmitting wavelength of 200 meters until the reopening of navigation, approximately the 15th of April, 1920." This concession was stated (in the Order itself) to be "in the nature of an experiment"; and the Department further announced that if no interference resulted, it was "prepared to consider a permanent amendment to the regulations regarding wavelengths." <sup>26</sup>

The inquiry, re experiences on short waves, was as follows:

In an editorial called "Greetings, Canadians!" Editor Warner announced that the League's Operating Department had been expanded to include Canadian Amateur Divisions. Then he said (at 15, January 1920):

. . . Can't we be of assistance in working out your technical problems? You are invited to make use of *QST* for this purpose. Relay transmission on 50 meters is an entirely new field to most of us, but we are sure it can be done. *QST* will welcome discussions and articles on this topic. For best results, should the transmission be by the usual spark method, by buzzer modulated v.t. oscillators, or by a big he-buzzer? What kind of a receiver will we have to have to get down to your fifty- or seventy-five meter wave? . . .

It is probable that our "Cousins" decided to put all of their energies into efforts to obtain permission to operate on 200 meters during part (or all) of the year; because I can find no evidence, anywhere in the first 5 volumes of *QST*, that American amateurs were ever given any useful information growing out of any actual use

type ZRFD receiver, tuning down to 175 meters, is described.

In the August (1921) issue, PeForest Radio Tel. & Tel. Co. advertised its Type MT-10 J Tuner (150 to 600 meters). See 107, August 1921 (Volume V).

<sup>22</sup> At 48, June 1920, Mr. Bowden Washington, chief engineer of Cutting & Washington, stated (in a letter) as follows: ". . . The writer some years ago put 4.6 amperes into an antenna 15 feet high and 25 feet long at a wavelength of 80 meters and a spark frequency of 1000. . . ." Spark sets would operate on 100 and 150 meters, all right.

At 64, January 1921 (Volume IV), F. B. Llewellyn's letter says that the U. S. Navy used a 52-meter wave for short-distance work during World War One (type of set not mentioned).

<sup>23</sup> 23, February 1921.

<sup>24</sup> See the editorial: "Reducing 'Legitimate' Interference," 17 to 18, February 1920.

<sup>25</sup> At 13 to 14, January 1920, it was stated that the problem of QRM control, at various centers, was becoming "most formidable." Local clubs were urged to grapple with it, and were also invited to affiliate with the League. The Traffic Manager recommended local control of QRM between the hours of 9 p.m. and midnight, "education" of the younger element, etc., etc.

In March (1920), an outstanding article on "Radio Club Organization," by F. H. Schnell and R. H. G. Mathews, was published. See 5 to 6, 21 to 22, March 1920.

The Tacoma Radio Club began controlling local QRM, promptly. See 31, March 1921 (Seefred Brothers' report). As to efforts made in Baltimore, Md., see 28, June 1920 (Service's report).

The rules and regulations adopted at Chicago, and placed in effect as of July 12, 1920, will be found at 38, August 1920 (Volume IV).

For a full exposition of "The Chicago Plan," see Mr. Mathews' paper, published at 23 to 25, May 1921 (Vol. IV).

As to the later spread of the Chicago Plan, see the follow-





of 50-, 75-, or 100-meter wavelengths by the Canadian hams.<sup>27</sup> *An opportunity to "discover something" surely was missed.*

This is an outstanding example of "how a horse can be led to water, but can't be forced to drink." And here, the "horse" evidently did not fancy the looks of the "water" which was in the short-wave "trough." *The 50-, 75-, and 100-meter waves must have appeared to be pretty useless, except for short-distance work on spark transmitters.* Amateur tube sets, operating on waves as short as these, were unknown; and when it came to receivers, most hams could reach only a very short distance below 200 meters. Personally, I can't blame the Canadian amateurs for acting as they did.

The real lesson appears (to me) to be this: In radio communication work, that which appears useless, or of little value "today," may be of considerable use, and of high value, "tomorrow."

A small amount of international traffic began to be handled between Canadian and U. S. A. amateur stations, at a few points.<sup>28</sup>

The League and its members could not give all their attention to the technical development of amateur radio, by any means. Postwar days brought a wave of proposed radio legislation.

The leading article on the subject, in Volume III, is entitled "The Amateur Situation," published at 5 to 6, September 1919.

This reports a visit of a League representative (or representatives) to Washington, and the discovery that the Secy. of the Navy had addressed a letter to both houses of Congress, setting forth the "Views of the Navy Department in connection

with references in Volume IV: adopted in Boston (Entwistle), 35, July 1921; Atlanta Radio Club adopts it (Merritt's report), 37, July 1921; adopted, with modifications, by Cleveland amateurs (Mathews' report), 47, April 1921; a scheme modeled on it is adopted in the Minneapolis-St. Paul (Minnesota) area. (Pray's report), 38, December 1920; advocated for country-wide use (by Scholtes), 22, April 1921; a lecture by Mathews inspires adoption of a similar scheme at Philadelphia, 42, April 1921.

<sup>26</sup> 8, March 1920.

Some Canadian hams later received special licenses allowing year-round operation on 200 meters. Canadian 9AL (at Toronto), for instance. See 38, June 1921 (Volume IV).

Note that the Canadian hams (despite their hard luck in other matters) got back on the air after World War One sooner than we did. J. O. Smith (at 16, September 1919) reported them as already being in operation; but he failed to give the date when this reopening had occurred.

<sup>27</sup> At 28, July 1920, in Service's report, there is a statement that "W. T. Fraser, District Superintendent Western New York, reports that tests with Toronto, Ont. were very satisfactory. No trouble was experienced in working them, but since navigation was opened they are allowed only (a) 50 meter wavelength. . . ."

At 34, July 1920, in Russell's report, we find these words: ". . . with the opening of navigation the wavelength allowed amateurs automatically dropped to the old 50 meters, thus pretty effectively cutting off any long distance work. . . ."

At 27, August 1920 (Volume IV), Russell notes the refusal of the Canadian authorities to allow the Canadian amateurs to remain on 200 meters during the navigation season. On the same page, he remarks that "This decision by the Naval Department emphasizes what has been preached by all the leading amateurs of this Division [the Ontario — S. B. Y.]; i.e., that c.w. transmission is the only solution for amateurs in Ontario compelled to work on so short a wave. . . ."

At 31, September 1920 (Volume IV), it is announced that

with certain aspects of radio communication." (This was known as "Document No. 165.")

A subcommittee of the Senate Committee on Naval Affairs, headed by Senator Poindexter, was found to be functioning as a special commission to study conditions. It was then reviewing the status of "world-wide radio" problems.

The subcommittee had asked the Navy Department to tender a draft of a law embodying



the desires of the Navy, as expressed in "Document No. 165," so that the subcommittee could study the same.

In the House of Representatives, the matter was in the hands of the Committee on Merchant Marine and Fisheries.

The article (in the September, 1919, *QST*) describes the contents of the Secretary's letter ("Doc. No. 165"), as follows:

... After reviewing the situation in detail from the Navy standpoint, the letter asks (1) the appointment of a special commission to study radio problems; (2) authorization to the President to designate specific bands of wavelengths for different classes of work; (3) a Navy monopoly of ship-to-shore radio; (4) a Navy monopoly of transoceanic and international radio; (5) authorization to use Navy radio stations for commercial and press business; (6) authorization to the Navy to assist American enterprise in the general development of American radio.<sup>29</sup> . . .

This article's recital of the discussions between the League's emissary (or emissaries), and the Navy Department (at Washington), merits extensive quotation. Note, also, that the late President Franklin D. Roosevelt was then Asst. Secretary of the Navy; and that in the absence of Secretary Josephus Daniels (who was then in Hawaii), he acted as one of several spokesmen for the Department in these talks.

... We found the Navy Department surprised that we should feel any alarm over the proposed legislation, as they point out that no mention of amateurs is made and that the amateur situation was not even considered by them in this matter. In turn, however, we have been obliged to point out to the Navy that they previously attempted to eliminate us and that the resulting skepticism, coupled with their postponement of our reopening August 1st as planned, causes the amateur to regard with distrust any move on their part to get control of radio. We really wanted to ask what assurances

they could give us that, if they secured control of all radio, the stringency of restrictions would not be increased to an extent resulting in our virtual elimination; but the legislation is not yet drawn up and we found the gentlemen wholly in sympathy with the cause of the amateurs and desirous of dispelling the distrust with which we have been regarding them. We told them we desired *recognition* in their contemplated legislation; i.e., rather than make no mention of amateur radio and leave our future to the discretion of some individual, we wanted our status defined in the new bill. The Office of the Director of Naval Communications, which is handling the matter, then invited us to tender our views of how the amateur should be recognized in the new law, and accordingly, as *QST* goes to press, a meeting of the ARRL Board of Directors is being called to formulate our ideas for presentation to the Navy Department and it is probable will also arrange to have us represented in force at the hearings of the bill, to make sure that nothing goes wrong, and that nothing inimical to our interests is contemplated in the Navy's request for "a comprehensive system of regulation and control" to achieve "the full utilization of radio for internal communication."

We are surprised to find no apparent connection between the postponement of our reopening on August 1st and the simultaneous request of the Navy for new legislation. They deny that we were held up to enable them to railroad thru a bill which would endanger us before their control automatically expires with a declaration of peace. But the sad fact remains that we are *not* opened, and no information is forthcoming *why*. Mr. Daniels is in Hawaii and the Assistant Secretary of the Navy stated Mr. Daniels personally disapproved the opening order and that he (Mr. Roosevelt) did not know why. . . . We pointed out to Mr. Roosevelt the bad odor overhanging the whole affair and the extreme desirability of a statement by the Navy explaining why we are held up and what we may expect, if the suspicion with which the amateur world regards the Navy Department is to be eliminated. Mr. Roosevelt promised to immediately radio Mr. Daniels,

Canadian 5BR, at Vancouver, B. C., is operating a half-kilowatt transmitter of some undisclosed type on 100 meters (Mumford's report). This probably was a spark set, I think.

The requirement that a 50-meter wavelength be used during the navigation season is referred to as a *handicap* in an editorial at 29, February 1921 (Volume IV).

Canadian 9AL had a special license to use 200 meters. See 38, June 1921 (Volume IV). This is in Russell's report.

In Hertz's report (32, April 1921, Volume IV), it is stated that the synchronous 360-cycle spark transmitters, found on some Canadian ships and shore stations, and used at one Canadian amateur station (5PC), might do well on short waves.

At 34 to 35, August 1921 (Volume V), Russell declares: "The short wavelength allowed the amateurs near routes of navigation makes it extremely difficult to do any DX work, although certain amateurs (ex-commercial operators), have been able to get licenses for 200 meters for all the year round. . . ."

The new April 1, 1922, Canadian regulations allowed general amateur stations to use spark on 180, and c.w. on 200 meters. Amateurs with special station licenses were permitted to use 275 meters on c.w., and 200 on spark. (See Russell's report, at 46, June 1922, in Volume V.)

Canadian 3GN (H. R. Byerlay, of Ingersoll, Ont.) operated his spark transmitter on 170 meters, and found that this was disadvantageous, because few receivers could tune down that low. He wanted to try 140-170 meters, but believed the receiver situation was even worse, down there. (See his letter, at 62 to 63, April 1922 Volume V.)

<sup>28</sup> At 17, September 1919, Entwistle asked amateurs in northern Maine and N. H. to cooperate with Albert J. Lorimer, of Montreal, in developing some trunklines between Canada and the Northeastern U. S. A.

At 26, March 1920, J. O. Smith said: ". . . The managers of the Atlantic, Central, Rocky Mountain and Pacific Divisions report, however, that considerable traffic is now being handled across the border. . . ." The reports cited don't support such a broad statement. Maybe they were cut down before publication.

Traffic Manager Smith, at 26, May 1920, stated: ". . . There has been much activity among Canadian amateurs during the past winter, and parts of Canada not heretofore represented in active relay work have become closely connected with activities in the states, by means of the trunk lines of the League, which have been extended into Canada with such excellent results. . . ."

Russell's report for the Ontario Division (at 33, June 1920) recites that ". . . Permanent daylight communication has now been established from Toronto to Buffalo via 8ZNI, and the new Niagara Falls station should also be in working order by the first week in May. . . ."

Lorimer's report re the St. Lawrence Division, at 45, June 1920, says:

"The route from this division to the United States was opened much sooner than had been anticipated and is now open for traffic.

"The attempt to work direct with 2SZ at Troy, N. Y., failed. Normally the Albany stations are QSA here.

"We have been advised by N. P. Mason of Plattsburg, N. Y., that his station 8BB could bring our route

and we hope to know soon just where we stand. Apparently Mr. Daniels personally is responsible. The whole proposition is so basically unjust, so uncalled for, that we do not believe it will long obtain.<sup>30</sup> . . .

Further news on the legislative "picture" was given in another editorial, at 11 to 12, October 1919. (This one was entitled: "Daniels Only Knows.")

The ARRL had caused a Resolution to be introduced in Congress, known as House Resolution 291. This had requested the Secretary of the Navy, "insofar as compatible with the public safety, to furnish reasons why the restrictions [had] not been removed." This document had been referred to the House Committee on the Merchant Marine and Fisheries.<sup>31</sup>

After reciting these facts, the editorial then reported that on August 28, 1919, the Navy Department had furnished to the Senate Committee on Naval Affairs a tentative draft of its new Radio Bill — the so-called "Government-monopoly" law.

The objections of the amateurs are thus stated:

. . . the big thing is that instead of providing regulations for wavelength, power, etc., this bill would provide for the existence of a technical radio

thru New York State to Albany, N. Y. A quick test was arranged from 2BF (Can.) and communication established with SBB with little trouble.

"SBB can route traffic east to 1VB at Hanover, N. H. and south to 2SZ and 2BM. As soon as an operating schedule can be arranged we will be able to handle traffic for points in Quebec.

"District Superintendent Jarest reports considerable activity in the vicinity of Levis, with new stations coming along fast. He will attempt to work a route thru to Northern Maine which will connect with the Atlantic route north of Boston. . . ."

At 31, June 1920, Pray's report contains the following paragraph:

" . . . Mr. Gjellhaug, Dist. Supt. for Northern Minnesota, reports that he has been testing with the station of the Radio Club of Winnipeg and expects soon to have a route across the border that can handle traffic regularly. He has had some correspondence with the Winnipeg Board of Trade, with some very good suggestions, regarding the status of radio relay work, which is expected to speed things up in that direction."

29, 5, September 1919.

Just what "American enterprise" there would be left, to "assist," if such a law had been enacted, I don't know.

<sup>30</sup> At 13, August 1919, an editorial called "The Lid" had reported the collapse of an expectation that the ban on transmitting would be lifted on August 1, 1919. The Navy Department had stated that the restriction would continue until the President should declare that a state of peace existed.

At 6, September 1919, it is said: ". . . Mr. Roosevelt stated we would be released 'as soon as Mr. Daniels would permit it' and in response to an inquiry addressed by a Senator, wrote that 'the Department has decided to remove the war-time restrictions on radio coincident with the proclamation of peace by the President.' . . ."

<sup>31</sup> This Resolution was not effective. However, Hon. William Stedman Greene, Chairman of the House Committee on The Merchant Marine and Fisheries, later prepared another (and similar) Resolution (H. J. Res. 217), directing the Secretary of the Navy to remove the Amateur restrictions. This evidently caused the Navy to act. See "The Champion of the Amateurs," at 5, November 1919.

<sup>32</sup> This was not the last to be heard from the so-called "Poindexter Bill," however. See 5 to 6, 12, December 1920 ("Dangerous Legislation Confronts Us"); and 28, June 1921 (both references are in Volume IV).

committee, composed of one representative from each department of the government, who in closed session would formulate and promulgate regulations concerning wavelength, power, decrement, purity, operating procedure, etc., for all the classes of stations. This new law states we should use no wavelength except that set for us by the committee, and then leave the regulations to be framed from time to time at the discretion of the committee instead of being definitely set forth in the law. This is small assurance for the continuance of amateur radio, with our destinies entirely in the hands of a government committee who would not be empowered even to hold public hearings where the affected classes of stations could explain their cases. . . .

The November (1919) issue of *QST* reported (see page 4, November 1919) that the Navy's proposed Bill had "died in Committee," and had not even been "reported out."<sup>32</sup>

— . . . —

Part III of W6CO's index to Volume III of *QST* will appear in a subsequent issue. — Ed.



**25 Years Ago**  
this month

April 1930

. . . The first editorial announces the ARRL Board of Directors meeting in Hartford on May 2nd and 3rd. In the second, Editor Warner expresses his pleasure concerning the increased occupancy of the 20-meter band, although he states that it isn't as great as it should be. In the last, note is made of the effect of sun-spot cycles upon the usefulness of high frequencies.

. . . The background and importance of amateur radio is the theme of a report concerning President Maxim's recent testimony to the Senate Committee on Interstate Commerce.

. . . Technical Editor James Lamb tells about experiments above 28 Mc. using new u.h.f. transmitters and antennas. NKF, the radio station of the Naval Research Laboratories, is the site of the investigations.

. . . The "Old Man" continues his war against the out-of-band boys in "Say, Son."

. . . "The Superiority of Screen-Grid Detectors" is persuasively discussed by Rydberg and Doty. Shown in the article is an experimental receiver using a UX-224 detector and a UY-227 audio stage.

. . . An a.c. operated receiver for c.w. is described by WSAYO. It features good performance on 20 meters and a low hum level.

. . . In "The ABC of Filter Design," Paul Zottu covers the subject in a simplified manner with practical mathematics.

. . . A multirange capacitor is described in "Revolutionary — and How!" by Otto Luther. It provides longitudinal as well as rotary motion of the shaft.

. . . "Radio-Controlled Airport Lights," by Belgrave Gostin, gives a résumé of recent tests in this new electronic application.

## FEED-BACK

W3OTC writes that the microphone transformer used in his 50-Mc. mobile rig (January *QST*) should have carried the type number A4705 instead of A4708. Actually, any small microphone transformer will do, of course.



# Hints and Kinks

## For the Experimenter



### OPERATING THE HEATHKIT MODELS VF-1 AND AT-1 AT 21 MC.

WITHOUT modification of one unit or the other, the VF-1 and AT-1 will not operate in combination at 21 Mc. The transmitter was designed for Novice use with crystal control. It employs a 5-Mc. crystal and operates with the oscillator plate circuit tuned to 10.5 Mc. when output at 21 Mc. is desired. In designing the VFO, however, it was desirable to produce a device with universal application, which would work with a majority of transmitters and use a minimum number of basic oscillator frequencies. As a result, the VF-1 was designed to deliver 7-Mc. output and must be followed by a frequency tripler if 21-Mc. excitation or output is to be made available. It is in this way that the incompatibility (at 21 Mc.) of the two units developed. Needless to say, the next model revision of the AT-1 will incorporate changes to clear up the matter.

Those who own Models VF-1 and AT-1 may make a simple modification to the transmitter which permits the VFO to be used "as is" for exciting the rig at 21 Mc. The change consists of adding a s.p.s.t. wafer switch to the plate circuit of the AT-1. The switch is used to open the 10.5-Mc. tap on the oscillator plate coil whenever the transmitter bandswitch is set at the 21-Mc. position. With the main switch so set, and with the new switch in the open position, the oscillator tank will cover the 7-Mc. range necessary for tripling into the 21-Mc. band. Naturally, with this method of operation, the 7-Mc. output from the VFO is fed straight through the oscillator to the grid of the 6L6 and the final is operated as a tripler.

The new switch should be mounted on the front panel of the AT-1 to the lower left of the meter. This places the wafer of the switch in front (as seen from the rear of the transmitter) of the oscillator plate coil. In rewiring the circuit, first disconnect the lead that runs to terminal No. 2 (see pictorial No. 2 of the Heathkit manual) at the top of the oscillator coil. Now, connect this lead to the rotor contact of the new switch and then add a short lead between the stator contact of the switch and terminal No. 2 of the coil. In other words, the s.p.s.t. wafer is wired in series with the 10.5-Mc. tap for the oscillator inductor.

Obviously, this extra switch does not represent the "ideal" in convenience. However, for those who wish to operate at 21 Mc., it is a far more desirable modification than would be one involving alterations to the VFO circuit. Furthermore, the change can be accomplished without any great expense or difficulty and permits

making use of 21-Mc. dial calibration of the VF-1.

— E. B. Mullings, W4MKZ/S

— — —

ALTHOUGH the popular Heathkit type AT-1 transmitter works properly when using crystal control, it will not perform satisfactorily at 21 Mc. when used in conjunction with the Heathkit model VF-1 VFO. The reason why the two units do not work together at this frequency has been explained by W4MKZ/S earlier and need not be repeated here. However, the method used here at W9RQT to remedy the condition may be of interest to those who do not wish to drill into the panel of their AT-1. The operation requires the addition of a single padder capacitor to the VFO and necessitates absolutely no modification to the transmitter. It does, however, eliminate the 11-meter range of the VF-1.

With the original VFO circuit, excitation for the 11-meter operation of a transmitter is obtained by switching in a padder that provides a VFO tuning range of 6740 to 6898 kc. This particular capacitor is the 4.5- to 25- $\mu\text{f}$ . job shown at the lower left-hand corner of the diagram for the model VF-1 (see Heathkit manual). By increasing the effective capacitance of this padder, it is possible to obtain a VFO range of 5250 to 5362 kc. I used a 50- $\mu\text{f}$ . silver mica as the new padder, but there is sufficient space available for the installation of a variable capacitor if the latter is preferred.

With the new set-up, the VFO unit is set at the old 11-meter position and the transmitter bandswitch is adjusted to the normal 21-Mc. position for output at the latter frequency. The 5-Mc. output from the VFO is then doubled in the AT-1 oscillator plate circuit and the final of the transmitter operates as a doubler as before.

The output coil for the VF-1 should be readjusted to peak the output at the new tuning range and the 11-meter scale of the dial can be recalibrated in terms of 21-Mc. frequencies. Excellent bandspread — nearly 180 degrees of the main tuning control — is obtained at 21 Mc. with the modification completed.

— Richard O. Bremigan, W9RQT

### GROUNDING SHAFTS OF VARIABLE CAPACITORS

LACKING other means of grounding  $\frac{1}{4}$ -inch shafts on variable capacitors, a small Type 8 grid cap (for 6J7s, etc.) slipped over the shaft behind the panel, and tied to ground with a sturdy wire, makes a very effective sliding contact.

— D. B. Angel, W8DBF

## GROUND AND POLARITY TESTER

**I**n the interest of safety, it is advisable to test all leads to ground (earth) for resistive characteristics. A resistive circuit or lead to ground is not a safe one and may not be depended on as a means of preventing accidental shock.

The simple circuit shown in Fig. 1 may be as familiar to many hams as it is new to others,

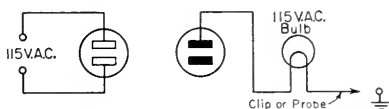


Fig. 1—Diagram of the simple ground tester described by W4UEB.

but it does provide one of the quickest means of checking the effectiveness of a ground lead. An ordinary lamp bulb of almost any wattage rating is used as the indicator for the tester. One terminal of the bulb is connected to a standard 115-volt plug and the second terminal of the lamp is connected to a heavy clip or probe which in turn is used to make contact with the ground point under test. The bulb will light to full brilliancy when connected between the a.c. line and a good ground point. On the other hand, less than normal brilliancy indicates a poor ground connection.

A second use for the simple circuit is that of testing for either the hot or the grounded side of the a.c. line. The bulb will light when the active side of the plug makes contact with the hot side of the a.c. receptacle and will fail to glow when contact is made with the grounded side of the line.

— Joseph A. Wright, jr., W4UEB

[EDITOR'S NOTE: Two precautions should be observed when using the lamp-bulb ground tester. When testing the effectiveness of a lead, make sure that the test lamp is lighted to full brilliancy by checking it against a lamp of similar rating that has been plugged into a convenient 115-volt socket. Second, when attempting to determine the polarity of an a.c. outlet, make sure that the test lamp is a good one; remember, a burned-out lamp won't glow even when connected to the hot side of the line.]

## MODIFYING COMMAND TRANSMITTER RELAYS FOR 6-VOLT OPERATION

**W**hen modifying Command transmitters, many hams discarded the seemingly useless antenna relay—the one with two coils and no standard contacts. Fortunately, I saved mine and have since found a good use for the units.

The keying relay for the transmitter is ideally

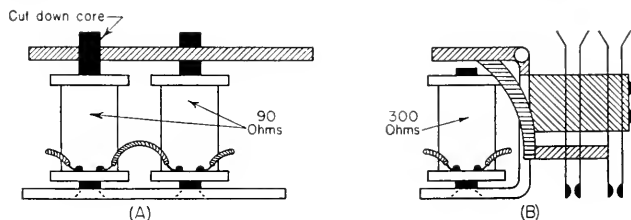


Fig. 2—Drawings of the Command transmitter relays. The 300-ohm winding of B is replaced with a 90-ohm coil from A in the modification suggested by W6BOQ.

suited for mobile gear because of its compact size and pair of s.p.s.t. contacts, but it won't operate on 6 volts. However, the 300-ohm coil for this relay can be easily replaced with one of the 90-ohm coils from the antenna relay. To complete the transfer, it is necessary to reduce slightly the length of the core for the 90-ohm winding, and this job can be quickly done with a hack saw and file. Removal and relocation of the coils is a simple task because each is held in place with a single flat-head screw.

The modified relay (Fig. 2B) really works on 6 volts and draws only 70 ma. or so from the battery. And the compactness involved is enough to catch the eyes of any mobile fan.

— K. M. Isbell, W6BOQ

## SIMPLE V.H.F. R.F. OUTPUT INDICATOR

**A**n inexpensive trimmer capacitor and an ordinary pilot lamp, wired in series as shown in Fig. 3, makes a useful output indicator for v.h.f. transmitters. An indicator of this type is es-

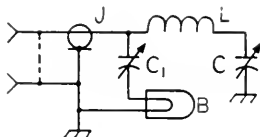


Fig. 3—Circuit of the simple v.h.f. output indicator. C, L and J are transmitter components; B and C1 are indicator components.

pecially helpful at v.h.f. where one of the most common indications of circuit resonance—minimum plate current—is frequently difficult to observe.

The indicator may be permanently connected across the series-tuned output circuit of a transmitter. A 3–30- $\mu$ f. trimmer and a 60-ma. bulb are used with the 30-watt rig here at W2FFY. The power consumed by the lamp, about a tenth of a watt, is negligible. By adjusting the trimmer and by employing lamps of various current ratings, the indicator circuit can be used with a wide range of power levels.

In addition to providing means for indicating maximum power output, the arrangement provides a continuous check on transmitter performance. The fact that the indicator is permanently connected across the output circuit prevents the need for retuning as is frequently the case when plug-in or clip-on indicators are temporarily installed.

— George E. Hyde, W2FFY



# Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

## T.R.F. FOR S.S.B.

49 Claude Ave.  
Denville, N. J.

Editor, *QST*:

I had an interesting experience recently which made me wonder if it had occurred to anyone else.

I set up an old SW-3 receiver (vintage of the 30s) for the first time in many years. After getting it into proper operating condition, I was checking it against my present modern superhet receiver and suddenly decided to see how it would perform on single-sideband signals. Quite a surprise! It performed remarkably well and proved in some respects comparable to the superhet.

For some time the general method of receiving single-sideband signals on a modern superhet receiver has called for the a.v.c. off, the beat oscillator on, the a.f. gain control up and the r.f. gain control varied according to input level; then starts the job of carefully tuning the b.f.o. for proper demodulation.

Well, the old t.r.f. doesn't have a v.c., is decently selective in its c.w. condition, has good sensitivity (controllable) and readily demodulates single-sideband signals. It has, of course, the disadvantage of being easily overloaded by excessively strong signals. However, for only three tubes it proved to be a remarkably usable receiver.

... All of this to prove that a receiver designed for conditions approximately twenty years ago is still acceptable for a method of transmission that was virtually unheard of in Hamdom at that time.

— W. J. Hicks, W2HQG

## INTERPLANETARY TRAFFIC

138 Cordova St.  
Syracuse 5, N. Y.

Editor, *QST*:

A suggestion to the traffic-handling fraternity. We who deliver overseas messages should be careful of the abbreviation MARS, whether by telephone or in writing.

Recipients of overseas messages can get some pretty wild ideas for which they can hardly be blamed. Is it their fault when we deliver to them a radiogram, the origin of which is, for example, "Korea via MARS," particularly when the remainder of the message is obviously genuine?

Unless we wish to perpetuate the general impression of ham radio as being a "kid's hobby" by adding this additional Buck Rogers angle of "—via MARS," it would be better when delivering overseas radiograms to mention that organization by its full name or punctuate the abbreviation.

— Jerome Blaisdell, W2IEP

## SINES

3434 74th Ave., SE  
Mercer Island, Wash.

Editor, *QST*:

I don't like to write to the editor, but my subject hardly has the makings for an article for *QST*, so guess I gotta do it this way.

Here's the deal: Almost without fail on a c.w. contact (as well as 'phone) names are exchanged. Right? You know — ur sigs hr are RST xxx; name hr is . . . , etc. That's fine for 'phone — doesn't take any longer to say "Uncle" or whatever, than to say "Ed" or sumpin. But . . . I've pounded brass commercially, in the Navy, and on ham circuits for nearly 50 years and in Navy and commercial work any "code" man who bothered with a name for a designation was "out of this world" or "sissy" or something. No respectable code operator (including railroad telegraphers, Western Union, RCA, Press Wireless, Mackay Radio, etc.) would even think of using anything but a sine of two, maybe three, and occasionally only *one* letter! This, of

course, was born of the practice of pinning down the commercial, Navy, or private telegrapher who actually receipted for the message, so the responsibility, in case of error, could be fixed. You know . . . dispatcher sends a train order and FS receipts for it by sending . . . , which (in International Morse) is his "sine." Or, an RCA man in New York sends one to Stavanger, Norway; it's receipted by Gustave somebody-or-other. Does he spell out R NR 1 GUSTAVE? Not by a darned sight — it's R GV and that's that!

My point is, let's write it up and boost it along in *QST* — c.w. men use sines of two or three letters. (Max, if it happens to be the guy's name, is also a good sine); 'phone men continue using *names!* Take a name like mine — just ain't no abbreviation worth a hoot, so I spell it all out, H-O-W-A-R-D? Not me! I've been using YB for a "sine" for better'n 40 years, and betcha I'm better known in ham, Navy and commercial circles than I'd ever be as Howard!

How about it — sines for c.w. men — names for 'phone operators — who'll go along with me on this?

— Howard S. Pyle, W7OE

## REAL TECHNICIAN

3776 Moorpark Avenue  
San Jose 28, Calif.

Editor, *QST*:

On the issue of allowing Technician Class holders to operate on a lower band. . . .

The question, I think, is not one of which to allow — 2 or 6 meters — but whether to allow either! Along with quite a few other hams, some Technician holders like myself, I do not want lower frequencies.

There are quite a few Novices who also hold Technician licenses and who will want to use them only after they have failed their General code test. They are mainly the ones who want these extra privileges even though they have done nothing to deserve them! They are seeking only easy operating conditions.

I have never held or ever will hold a Novice license. My sole purpose in amateur radio is to experiment with transmission on high frequencies, which I thought when I obtained it, was the Technician's purpose. I feel that any changes in its privileges would defeat this well-founded idea!

— Ron Rodd, K6IOM

## IT'S REALLY SO

25 Hilltop Road  
Philadelphia 18, Penna.

Editor, *QST*:

For many years now my fellow amateurs and I have been following the activities of the "Podunk Hollow Radio Club" as duly depicted on many covers of your excellent journal, *QST*. For an equal number of years I have been wondering what the significance of said organization might be. Granting the obvious fact that the purpose of the "Podunk Hollow Club" is aptly to demonstrate the foibles of club activities, we yet wonder about the selection of the term "Podunk Hollow" as the surreptitious name of the locale from which the club derives its members.

Having recently completed extensive research into the subject (quite by accident — began and completed fifteen minutes ago), I have discovered the real significance of the term "Podunk Hollow," which has been hidden from the members of the League. At first, one might suppose the term "Podunk" to be employed in the sense meaning countryish, small-townish, or hick. However, my research has disclosed an entirely different definition of the term — or rather the full term "Podunk Hollow."

This evening (the rig being out of commission), I pulled down a rather archaic volume from my father's bookcase. (Continued on page 148)

## A.R.R.L. CONVENTIONS

### FAR EASTERN PACIFIC DIVISION

*Agana, Guam — April 16th-17th*

The Marianas Amateur Radio Club is sponsoring the first ARRL convention to be held so far from Stateside. It will be held at Guam on April 16th-17th, and is under the jurisdiction of the Director of the Pacific Division. The convention has been approved by the military and all commands have been urged to cooperate. In conjunction with the convention, the Governor of Guam, Honorable Ford Q. Elvidge, has proclaimed the week of April 11th-17th as Radio Amateur Week of Guam. The program will include talks, papers, and discussions on interference, radio jamming, traffic handling, MARS program, civil defense, antennas, newest amateur equipment, single sideband, on-the-air courtesy, TVI, and harmonic suppression for those who rotate back to the States or foresee the coming of TV out "this-a-way." Civilians must make their own arrangements for quarters and eating. Further details may be had from the Marianas Amateur Radio Club, P. O. Box 145, Agana, Guam.

### OREGON STATE

*Portland, Oregon — May 7th-8th*

The ARRL Oregon State Convention, sponsored by the Oregon Amateur Radio Association, will be held May 7th-8th at the Portland Armory. Preregistration closes on April 25th. Those wishing to sign up early should write Helen M. Wise, W7RYM, 4311 S.E. Salmon St., Portland. Included on the program are lectures, contests, swap and shop, and tours. A fashion show and luncheon is planned for the ladies. The banquet will be held at 4:30 to enable those traveling long distances to attend. Preregistration fees: licensed amateurs, \$7.50; nonlicensed, \$3.50. Door fee: \$8.00 and \$4.00 respectively.

### COMING A.R.R.L. CONVENTIONS

April 16th-17th — Far Eastern Pacific Division, Agana, Guam

May 7th-8th — Oregon State, Portland, Ore.

May 21st-22nd — Pacific Division, Fresno, Calif.

June 10th-12th — West Gulf Division, Fort Worth, Texas

June 11th-12th — North Dakota State, Bismarck, N. D.

June 11th-12th — Southeastern Division, St. Petersburg, Fla.

August 12th-13th — Roanoke Division, Old Point, Va.

October 8th-9th — Central Division, South Bend, Ind.

October 22nd-23rd — Midwest Division, Omaha, Neb.

## Edison Award to W6VFT

Benjamin S. Hamilton, W6VFT, was recipient of the 1951 General Electric Edison Amateur Radio Award at a ceremony dinner held in Washington, D. C., on February 10th.



Congratulations are extended to Benjamin S. Hamilton, W6VFT (left), by FCDA Chief Val Peterson after the Edison Award was presented to him by J. M. Lang (center), manager of the GE Tube Department.

W6VFT, who resides in La Mesa, Calif., organized a top-notch radio network in San Diego county composed of an active 200-man civil defense radio system. In addition, he planned operational activities, wrote equipment specifications, and laid out the required physical facilities. Furthermore, he established an excellent communications system for the San Diego Chapter of the ARC. Mr. Hamilton serves as a communications officer with the 40th Division National Guard and is also an ARRL Section Emergency Coordinator.

Judges for the award were former Governor Val Peterson of Nebraska, FCDA administrator; Honorable E. M. Webster, FCC Commissioner; E. Roland Harriman, president, ARC; and ARRL President Goodwin L. Dosland, W0TSN.

The presentation ceremony was held at the Mayflower Hotel. Principal speaker for the occasion was Mr. Peterson, who paid this tribute to the importance of amateur communications: "... No matter how effective an enemy attack is, it can never destroy all of the amateur radio installations — the 120,000 of them — and that is why they are so important to civil defense and to the nation. ... I am not sure but what the first communications in the first few hours after an attack will be by amateur radio."

A special citation was also given to Carl J. Theis, WSBKH, who designs and builds radio equipment for use by Baptist missionaries in Liberia. Another special citation went to Carter Rogers, W8NCS, who operated continuously for 16 hours when a flash flood rendered the usual communications facilities of Richwood, W. Va., inoperable. In addition, 800 amateurs who participated in emergency operations during Hurricanes Carol, Edna, and Hazel were issued special certificates of recognition.



# YL NEWS and VIEWS

BY ELEANOR WILSON,\* W1QON

## YL Clubs

Recent years have seen the organization of several new YL clubs; we predict the formation of many new ones shortly. This month we'd like to make a start in the project of compiling information about the various existing clubs which are on record with us. If you are a member of a YL club which is "organized" — i.e., has formal name, officers, regular meetings, etc., — and your club does not appear below — please mail us a postcard with information about your organization.

In past departments we have already described two NYL clubs — NYLs of members of the Evansville, Ind., A.R.C., and NYLs of members of the Southwest Missouri A.R.C. If there are others, we'd like to know about them, too.

*The Young Ladies' Radio League* — International, with a number of affiliated YLRL units. Organized in 1939 by W3MSU, Ethel Smith, then W7FWB; approximately 550 members, all licensed women amateurs; dues \$2.00 per year; president, W6CEE, Vada Letcher, 1214-A Franklin, Santa Monica, Calif.; publishes *YL Harmonics* bimonthly; sponsors YL-OM Contest and YLRL Anniversary Party annually; conducts various nets; issues WAS-YL certificate and YL Century Certificate.

*Young Ladies' Radio Club of Los Angeles* — YLRL-affiliated; organized 1946; 55 members; meets second Saturday of each month at Schabers Cafeteria, 720 S. Hill St., Los Angeles; dues \$1.00 per year; president, W6PJU, Mildred Griffin, 1434 So. Olive St., Santa Ana; issues *Lad n' Lassie* Certificate.

*YL Radio Club of San Francisco* — a YLRL unit; organized 1954; 18 members; meets third Tuesday of each month at members' homes; dues \$4.00 per year for resident members, nonresident \$1.00 per year; president, W6QMO, Jeri Bey, 1530 47th Ave., San Francisco 22.

*Chicago Unit of the YLRL* — organized 1953; 20 members; meets on the fourth Saturday of the month at Gompers Park Field House; no dues; club station is W9DEQ; president, W9SEZ, Eleanor Engebretsen, 4304 No. Avers, Chicago 18, Ill.

\*YL Editor, *QST*. Please send all contributions to W1QON's home address: 318 Fisher St., Walpole, Mass.

## COMING YL GET-TOGETHERS

April 23rd — W1 YLs, Sheraton Plaza Hotel, Boston. Write W1TRE for details.  
May 20th-22nd — LARK Convention, W9 YLs, Alterton Hotel, Chicago. Write W9MYC.  
June 24th-27th — First YLRL International Convention, Hotel Miramar, Santa Monica, Calif. W6UIA, general chairman.

*The Ladies Amateur Radio Klub (LARK)* — a YLRL unit; organized 1952; 28 members; meets first Wednesday of the month at Austin YMCA, 501 No. Central Ave., Chicago; dues \$3.00 per year; president W9YBC, Gloria Matuska, 2322 So. 2nd Ave., North Riverside, Ill.; issues LARK certificate.

*Long Island Unit YL Radio League* — organized 1950; 20 members; meets monthly at members' homes; dues \$1.00 per year; president, KN2EBU, Min Jordan.

*New York City YLRL* — A YLRL unit; reorganized in 1912; 22 licensed members; meets monthly at N. Y. C. Civil Defense Building; dues \$1.00 per year; president, W2IQP, Lillian Klarfeld, 148 Leslie St., Newark 8, N. J.

*South African Women's Radio Club* — 117 members; president, ZS1GT, Daphne Hindes, "Westward Ho," 22 Beta Road, Bakoven, Cape Town, South Africa; publishes YL Beam bimonthly; will soon issue a Worked-ZS YL certificate.

*YLRL Club of Milwaukee (Wis.)* — organized 1953; 8 members; meets six times a year at members' homes; no dues; president, W9OMZ, Jeanne Pavak, 5776 No. 24th St., Milwaukee 9, Wis.

Even as this copy is being prepared, word arrives from W17BJD that on Feb. 14th twelve KL7 YLs met in Anchorage for the purpose of organizing an Alaskan YL Club. More details on this at a later date.

The above information is up-to-date as of February, 1955. All of the clubs welcome new members. For further particulars write to the club president.

The officers of each club are decidedly optimistic about the future. They foresee increased membership, greater club activity, and more significant contributions to amateur radio in general.

## Anniversary Party Results

Winners of the YLRL 15th Anniversary Party conducted during the first two week ends of last December are as follows:

### 'Phone

First — W3OQF (opg. W3MAX), Barbara Houston — 22,320

Second — W8H1WX, Lillian Richardson — 17,100

Third — W4YYJ, Lois Crane — 16,582.5

### C.W.

First — W4YYJ, Lois Crane — 6612.5

Second — W4H1LF, Arlie Hager — 6375

Second (tie) — W1FTJ, Dorothy Evans — 6375

Third — W1WPX, Evelyn Chase — 5362.5

'Phone section winner W3OQF has been aiming for top honors since 1951, when she placed third 'phone in the 12th AP. In 1952 she placed third c.w.; in 1953, second 'phone; and this year she'll receive the top prize, a loving cup, from last year's winner, W1FTJ.

Top c.w. scorer in the YLRL 15th Anniversary Party is Lois Crane, W4YYJ, shown at her OM's operating position.

**QST for**





All-ham families are so manifold nowadays that they are no longer a novelty. But when father, mother, son, and daughter all have ham tickets, interfamily competition is keen. Nevertheless, the sense of satisfaction and pride that the family experiences is strong. So it is, at least, with the Wiley family of Del Paso Heights, Calif. Dad is W6GKW, mom is K6DPM, and son and daughter are K6GPD and K6DPN respectively. YL Rubie and 12-year-old daughter Lorraine took their Novice exams at the same time, and a few months later passed their General Class exams.

YL contest winning fever is catching, at least in the Crane family of Birmingham, Ala. C.w. section winner W4YYJ will place her cup (received from last year's winner W4RLG) alongside that of her OM, W4ARR, who won last year's YL-OM Contest. A family race is predicted, for a cup must be won three times in order to obtain permanent possession.

Top 'phone scorers by districts: W1VOS 11,542.5, K2IWO 11,857.5, W3MAX 22,320, W4YYJ 16,582.5, W5SPV 3885, W6QGX 7455, W7YWM 15,400, W8HWN 17,100, W9AQB 10,920, W9OMM 11,962, VE3AJR 5400. Certificates have been awarded to each.

Other 'phone scores: W1MCW 6580, W1QON 1072.5, W1RLQ 2700, W1RYJ 367.5, W1UZR 1815, W1WPX 5445, K2DSL 675, W2EEO 1040, W3TYC 607.5, W4s BLR 420, CWV 1137.5, HLF 15,840, KYI 13,125, RIG 10,335, SGD, 6250; W5s RYX 3697.5, RJZ 1275, TTU 125, WUX 1620, WXY 50; K6ANG 900; W6s CEE 1590, EHA 1861.25, GQZ 1200, KER 375, PCA 1155, QOG 4600, QYL 60, UHA 2400, WRT 858; W7s HHH 1250, OOO 6660, RVM 5160, SNP 1755, TGG 5940, ULK 7837.5, VYG 1620; W8s ATB 2600, DNF 1920, HUX 4320; W9LOY 3375; W9s BFW 6037.5, ERR 2625, FVE 3277, JMJ 1260, MRJ 495, ZWL 675. Top c.w. scorers by districts: W1FTJ 6375, K2DXD 1218.75, W3QPJ 3656.25, W4HLF 6375, W5WXY 240, W6PCA 1487.5, W7SYF 187.5, W8HWN 4250, W9FVE 2600, VE3AJR 5040, VE5DZ 605. Certificates have been awarded to each.

Other c.w. scores: W1s RLQ 1625, VOS 1125, WPX 5362.5, YNI 438, YYM 2187.5; K2s CUQ 500, IWO 120; W3s CDQ 45, MAX 1100, TYC 2450; W4s BLR 1340, RIG 2250, YYJ 6612.5; W6EYA 481.25, W7VYJ 156.25; W6EHA 600; VE3DDA 403.

Thanks to W6KER, Gilda Shoblo, YLRL vice president, for tabulating and recording contest scores.

### QST an International Passport

During a recent trip to Spain, W2YCX, Carolyn (Carlie) Hull, found that her photograph which appeared in *QST* (this department, September, 1952) was her passport to a wonderful time in that country. Some of the hams she met there remembered seeing her picture and consequently accepted her as an old friend in real ham style.

Carolyn recounts:

Meeting Spanish amateurs was more fun to me than any sightseeing. One day I entered a radio store in Madrid, hoping to meet a Spanish ham. Words failed; I pulled out my QSL card. The salesman

understood and telephoned EA4BF, Alberto Kirschner. Alberto spoke fluent English and through long subscription to *QST* he knew much about ham radio in the United States. Subsequently, Alberto and his charming family invited me to a gathering of the URE or *Union de Radioaficionados Espanoles* (Union of Spanish Radio Amateurs), and I was able to learn something about amateur radio in Spain.

The URE is the only radio club in that country. EAs are handicapped by the high cost of good equipment and a dearth of components. The legal maximum power input is only 50 watts. These factors force each Spanish ham to use his ingenuity to the limit. He must be a technician as well as operator, and most EAs know their equipment inside out. By the judicious use of antennas and good operating conditions, the EA can hold his own with anyone in working DX; and despite operating difficulties, EAs are typical hams and have the true ham spirit.

There are very few Spanish YLs, and I was not only the sole YL at the meeting, but one of the first American YLs ever to visit them.

A reporter for *Revista de Radio*, the URE's amateur organ, asked me about my personal amateur activities, but no one asked me much about amateur radio in America, because so many of them read *QST*. Indeed, they know much more about us than we do about them!

### YLs You May Have Worked

As a result of local newspaper publicity about the Los Angeles Young Ladies' Radio Club, W6LBO, Mary Brandvig, publicity chairman of the club, was selected to appear



on the Groucho Marx radio and TV shows, February 16th and 17th. Mary and her program partner scored high on the quiz show but slipped on the jackpot question. Licensed in 1951, Mary finds her hilltop home at Manhattan Beach ideal for working her favorite band—two meters. She maintains regular schedules with stations up to 200 miles away. She is now serving with W9YBC as cochairman of publicity for the YLRI, First International Convention in June. Mary is the YL of W6EJL and the mother of a junior op.

(Continued on page 144)

# • Technical Correspondence —

## RE "LOW-IMPEDANCE TRANSMISSION LINES"

17 Random Road  
Princeton, N. J.

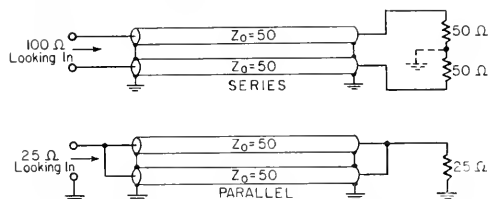
Technical Editor, *QST*:

Under "Technical Correspondence" (page 47) in the February, 1955, issue of *QST*, Lt. John J. Dougherty has a letter which induces me to make certain comments. While it may be true that particular antenna configurations may have influenced some people who were responsible for standardization of the characteristic impedance of transmission lines, I believe the evidence indicates that the choice was made on a much more sophisticated engineering basis. If one fixes the diameter of the outer conductor of a transmission line, it can be shown that — for air dielectric — the attenuation will be a minimum when the characteristic impedance is about 77 ohms. I believe this accounts for the nominal 75-ohm lines.

The standardization on 50-ohm lines is not as clear cut. Prior to standardization, flexible lines were made by filling 75-ohm lines with suitable dielectric material. As at present, these had a dielectric constant of the order of 2.25, which made the lines have a characteristic impedance near 50 ohms. The development of radar and the resulting high peak power further reopened the subject. For a fixed outer conductor and air-dielectric line, the breakdown voltage for a fixed input power is a maximum for a 30-ohm line. From discussions with people who were involved at the time the choice was made, it appears that 50 ohms was selected because it was already quite widely used and was a reasonable compromise between minimum attenuation and maximum power capability.

Near the close of his letter, Lt. Dougherty makes the statement that putting transmission lines in parallel reduces the transmission line losses. This is incorrect as can be shown easily using Lt. Dougherty's example. Suppose a single transmission line is properly terminated by a load and is of such a length that one half of the input power is lost in the line. Now if the load is transformed to one half the original value and two identical lines in parallel are used, the lines will be properly terminated and one half the source power will enter each line. As before, one half the power entering each line will be lost in the line. Obviously, then, each line will absorb one fourth of the source power making the total loss one half, exactly the same as in the case of the single line. The two-line system is capable of handling twice the power of the single line and a lower impedance load can be fed without additional matching means but line loss is unchanged. — *Wendell C. Morrison, W2YCE*

[EDITOR'S NOTE: Several letters have been received questioning the validity of Lt. Dougherty's statements about coaxial lines in "series" and in "parallel." The accompanying sketch may help to explain them further. It should be



obvious that the s.w.r. on the sections of lines will be 1.0 in each case, but the terminating loads are respectively twice and half the  $Z_0$  of the pieces of line.]

## MODULATION TRANSFORMERS

San Bruno, Calif.

Technical Editor, *QST*:

In plate-modulated Class C r.f. amplifier service such as we have in a.m. voice applications, there has been considerable confusion about the choice of the proper modulation transformer. As long as the transformer is big enough to handle

the power, and as long as we don't ask it to work into too high an impedance on its secondary, the only thing we have to worry about is obtaining the proper voltage transformation to make the audio and Class C tubes work correctly.

At the 100 per cent modulation level the peak value of the audio voltage out of the transformer should be just equal to the d.c. value of the plate voltage applied to the Class C stage. Similarly, at 100 per cent modulation we know that the peak value of the audio current component is also just equal to the d.c. plate current of the Class C stage. This current relation follows directly from the fact that the Class C amplifier plate circuit presents the same impedance to the audio source as it does to the d.c. power supply. That is why we calculate this impedance by dividing the d.c. plate voltage by the d.c. plate current.

Now that we know the peak audio voltage wants to be just equal to the d.c. plate voltage at 100 per cent modulation, we can start asking what the modulation transformer does. Basically, it must develop this desired output voltage when the primary of the transformer has the proper voltage present. This is the point where the audio modulator stage gets into the act. In order for the audio modulator tubes to work properly, the audio voltage built up in each plate circuit should be on the order of 70 per cent to 80 per cent of the applied d.c. plate voltage at the maximum signal level. Each half of the primary of the transformer must develop this audio peak voltage since each half has a separate tube across it.

Now if we happen to use the same d.c. plate voltage on the modulator (or audio amplifier) as we do on the Class C r.f. stage, the peak audio voltage at 100 per cent modulation which is developed in each half of the primary of the transformer is 70 per cent to 80 per cent of the d.c. plate voltage involved, and of the peak audio voltage developed in the secondary of the transformer (since the latter is equal to the d.c. plate voltage). This says that the number of turns in one-half the primary of the transformer must be 70 per cent to 80 per cent of the number of turns in the secondary. The number of turns in the full primary of the transformer is twice this, or 140 per cent to 160 per cent of the number of turns in the secondary. This is often stated as a primary to secondary turns ratio of 1.4 or 1.6 to one. Thus the modulation transformer is fully specified provided it is big enough to handle the power.

Note that the modulation transformer was chosen without mentioning the value of d.c. plate current drawn by the Class C stage, or the amount of plate current drawn by the audio amplifier. Also note that nothing was said about the exact impedance placed on the secondary of the transformer or about the impedance which must be presented to the audio amplifier. The fact that the current drawn by the amplifier and the load impedance are not involved in the choice of the modulation transformer is demonstrated daily in the operation of Class C amplifiers. Once a proper modulation transformer has been chosen we change the load on our Class C amplifier freely without in any way disturbing our ability to modulate well and with good quality.

The impedance presented to the secondary of the modulation transformer (or the voltage to current ratio) is dependent upon and will vary with the amount of d.c. plate current drawn by the Class C stage. Because the transformer transforms this impedance to the primary side by the square of the turns ratio, the primary impedance will also vary. It should be noted, however, that the voltage transformation is not upset by the way in which we vary the loading on the secondary of the transformer. This is the familiar behavior of 60-cycle power transformers.

For audio amplifiers used as modulators we don't have to concern ourselves about the particular value of load impedance which is listed on the tube data sheet. As long as the tubes are capable of supplying the desired output power, and as long as the modulation transformer has the right voltage ratio, the tubes will work efficiently and satisfactorily. As indicated above, an audio modulator works efficiently when the peak audio voltage in its plate circuit is some 70 per cent to 80 per cent of the d.c. plate voltage at maximum signal. In Class AB<sub>1</sub> modulators the peak audio voltage is somewhat smaller and may be nearer a 60 per cent figure. — *W. G. Wagener, W6VQD*

# 1955 V.H.F. Sweepstakes

## 8th Annual Winter Contest Activity at All-Time High

**I**N 1951, the low point in the history of the Annual V.H.F. Sweepstakes, 299 logs were sent in. Since then, the curve has shown a constant upswing: 365 in 1952, 385 in 1953, 610 in 1954. In the 8th running, January 8 and 9, 1955, the total climbed to 747, and this does not include a handful received after the mailing deadline. In just about any other category you can name, the 1955 V.H.F. SS was also a record-breaker.

Significantly, this came about under strictly normal conditions. Not a contestant reported any real break from conditions, yet in the more densely populated areas the contest ran hot right up through the last minute before midnight Sunday. Where heretofore more than 200 contacts by any one contestant has been a distinct rarity, no less than 15 made or exceeded the 200 mark this year, and quite a few of them turned the trick with just one band, 2 meters. W3IBH was the country's top man from the standpoint of contacts on one band, with 245 on 144 Mc., but it took W2UK's unheard-of section multiplier of 18 to post the country's top score. Tommy worked 176 stations for 6336 points, far exceeding the record of 4104 set by W2SAI, way back in 1950. And W2UK made them all on 144 Mc., and with the band dead! K2CMB's 248 contacts on 144 and 220 was the top in QSOs on more than one band.

How far the 1955 contest exceeded previous marks can be seen from the fact that nine contestants broke the old W2SAI record. As might be expected, most of these were in that hotbed of v.h.f. activity, the stretch of heavily-populated country between New York and Philadelphia, but not all the big scores were made there, by any means. W1UIZ/1, who had the temerity to take to the site used so successfully in past warm-weather contests by W1MHL/1 (Pack Monadnock Mountain, near Peterboro, N. H.) made 216 contacts in 13 sections, for 5603 points, and the No. 3 spot nationally. W1RFU, who *lives* on his mountain, in Wilbraham, Mass., landed in No. 2, with 218 contacts in 13 sections, for 5668. W6WSQ showed what can be done from the Los Angeles area, with 210 contacts on 144 Mc. alone. The lower section multipliers that prevail outside the small-section East kept his score out of the top ten, but his 2100 points belongs right up there with the best of them. The same goes for W8SVI, Fairborn, Ohio, who led all the inlanders with 146 contacts in 7 sections, for 2044 points.

Novices and Technicians were out in force, and there were 15 certificate winners in the newcomer categories. Novices won over-all section awards in Eastern New York and Indiana, and KN6GMV must have set some kind of

Novice record with 163 contacts on 2 meters in the Los Angeles Section.

Unlike the spring and fall contests, the SS doesn't give extra credit for use of higher bands than 144 Mc., but 31 contestants worked on 220 Mc. and 14 used 420. W6MMU managed several contacts on 1215, and W7JIP and W7OKV put their 10,000-Mc. gear to work for the party. W7ANS says that the first 220-Mc. work in the Seattle area came off during the contest.

It's the club incentive that makes the V.H.F. Sweepstakes what it is, the fourth-ranking ARRL operating activity, and the club activity was terrific in this year's event. It was a contest between two Philadelphia-area clubs, as often before, but combinations from other areas are gaining ground on the perennial leaders. The South Jersey Radio Association won another gavel award, with the first aggregate of more than 50,000 points in the history of V.H.F. SS competition, leaving their rivals, the York Road Radio

### CLUB SCORES

Club	Aggregate	Certificate Winner
South Jersey Radio Assn.....	52,361	W2PAU
York Road Radio Club.....	33,620	W3IBH
Hartford County Amateur Radio Assn.....	29,464	W1VLE
Hampden County Radio Assn.....	18,842	W1RFU
Dayton Amateur Radio Assn.....	13,715	W8SVI
Windblowers V.H.F. Society.....	13,010	K2CMB/2
Waltham Amateur Radio Assn.....	9242	W2BVU/1
Lakeland Amateur Radio Assn.....	6818	W2RGV
Morris Radio Club.....	6563	K2BI
North Penn Amateur Radio Club.....	6514	W3TDF
Northeast Radio Club.....	6158	W3TYX
Lake Success Radio Club.....	6064	W2BNX/2
El-Ray Amateur Radio Club.....	3386	W1JSM
Rochester V.H.F. Group.....	2593	W2UTH
Lockport Amateur Radio Assn.....	2548	W2ALR
Stratford Amateur Radio Club.....	1946	W1VYI
IBM Radio Club.....	1910	W2MHE
Queen City Emergency Net.....	1714	W8JSW
Framingham Radio Club.....	1532	W1N1ZW
Buckeye Shortwave Radio Assn.....	1328	W8CEQ
Levittown Amateur Radio Club.....	1206	W2JUN/2
West Side Radio Club.....	1088	VE3AIB
Burlington County Radio Club.....	868	K2DAP
Radiation Lab. Radio Club.....	780	W3LMC
Albuquerque V.H.F. Club.....	582	W5FAG
Johnson County Radio Amateurs Club.....	562	W8s GLN
		IJJ NNY*
Kenosha Radio Communications Society.....	364	W9ELO
Greensboro Radio Club.....	183	W4NHV
Winston-Salem Civil Defense Net.....	118	W4MRH
Hardin County Amateur Radio Assn.....	74	W4WNH

\* Three-way tie

The following clubs were also mentioned on less than three valid entries: Aero ARC, Albany ARC, Alma College RC, ARC of Falls Church, Capitol City RC, Chesapeake ARC, DuPage RC, Electric City ARC, Hamden ARA, Hamilton ARC, Kalamazoo ARC, Lake Washington ARC, Lower Columbia ARC, Mid-Island RC, Milford ARC, Milwaukee AREC, Nortown ARC, Ohio Valley ARA, Palo Alto ARA, Portland ARC, Providence RA, Quannapowitt RA, RA of Western New York, RA Open House RC, Sandusky Valley ARC, San Mateo County ARC, Santa Clara County ARA, Staten Island ARA, Steel City ARC, Tri-County RA, Tulsa ARC, Yale ARC, York ARC.

Club, far behind. The fierce competition (a private matter) between the Hampden and Hartford County clubs, "brought out the vote" in the Connecticut Valley, with the Hartford County Amateur Radio Association pulling up a good third in the country. Dayton turned out in force, but lost ground to 5th place from their No. 3 spot of last year.

In the following tabulation, scores are listed by ARRL divisions and sections. Unless otherwise noted, the top scorer in each section receives a certificate award. The highest-scoring Novice and Technician licensee also receives a certificate in each section where at least three such licensees submitted valid contest logs, asterisks denote these winners. Columns indicate the final score, the number of contacts, the section multiplier, and the bands used. A represents 50 Mc., B 144 Mc., C 220 Mc., D 420 Mc. and E 1215 Mc. and above. Multiple-operator stations, with calls of participating operators, are shown at the end of each section tabulation.

#### ATLANTIC DIVISION

##### *E. Pennsylvania*

W3BHH	4410	245	9-B
W3TDE	4270	215	10-AB
W3KKN	3762	209	9-AB
W3IKL	3472	217	8-AB
W3TYX	3330	185	9-B
W3SAO	2576	161	8-B
W3RZU	1848	132	7-B
W3PRJ	1722	123	7-B
W3SOB	1554	111	7-B
W3UMI	1526	109	7-B
W3NKD	1488	124	6-B
W3ARW	1474	67	11-ABC
W3UMT	1246	89	7-B
W3HWV	1200	100	6-B
W3AJF	1024	128	4-AB
W3UXI	1020	102	5-B
W3QVK	940	94	5-B
W3GRY	860	86	5-AB
W3HVJ	840	60	7-B
W3MYL	600	100	3-B
W3VGN	546	91	3-B
W3ZKG*	510	85	3-B
W3UZF	498	83	3-B
W3DHH	380	95	2-B
W3TEC	360	90	2-B
W3ULC	342	57	3-B
W3HJX	320	40	4-B
W3WED	312	78	2-B
W3EW	300	50	3-B
W3DJ	284	71	2-B
W3SMO	280	70	2-B
W3IMW	270	45	3-B
W3GBT	264	44	3-B
W3CLC/3	248	62	2-B
W3YIW	220	55	2-B
W3NYXC	216	27	4-B
W3IND	208	52	2-B
W3ZTB	200	50	2-B
W3OIX	188	47	2-B

W3WHJ	180	45	2-B
W3DYL	160	40	2-B
W3EDO	156	26	3-B
W3ZJF/3	150	25	3-B
W3VNI	144	36	2-B
W3TEA	140	35	2-B
W3VSQ	132	33	2-B
W3SQX	124	31	2-B
W3WIM	124	31	2-B
W3KDB	120	30	2-B
W3DNU	100	25	2-B
W3ZNJ	96	24	2-B
W3PNL	80	20	2-B
W2AFJ/3	68	17	2-B
W3PPC	60	15	2-B
W3IHF	32	4	4-B
W3QVI	28	14	1-B
W3Z XU	26	13	1-B
W3YCL	14	7	1-B
W3EDU/3 (W3S EDO MMV			
RAF ZPT, W3X3QJ)	3360	140	12-B
W3UCA/3 (W3S UCA UQC			
VUF)	656	82	4-B

##### *Mid.-Del.-D. C.*

W3CGV	1750	125	7-ABCD
W3TOM	1416	118	6-AB
W3WOD	1080	108	5-AB
W3LZZ	660	66	5-B
W3BYG	472	59	4-B
W3ONP	445	45	5-B
W3XSL	340	43	4-B
W3JES	270	45	3-AB
W3AIM	252	42	3-B
W3OTC	208	26	4-A
W3LMC	184	23	4-B
W3NII	180	30	3-B
W3KMY	176	22	4-A
W3HGX	152	38	2-B
W3YPW	132	22	3-B

W3KLA/3	126	21	3-B
W3ZMK	120	30	2-B
W3YZJ	104	26	2-B
W3PPY	36	9	2-B
W3PGA (W3KLA, W33ZAQ)	630	53	6-B
W3ZIB/3 (W3S JCI LMC			
RQP S8F WYJ YPW)	464	58	4-AB

##### *Southern New Jersey*

W2UK	6336	176	18-B
W2PAU	4720	236	10-AB
W2TBD	4480	225	10-B
W2GLV	3636	202	9-B
W2QED	3573	200	9-B
W2BLV	3536	221	8-B
W2NPL	2184	156	7-B
K2DCE	2160	120	9-B
W2LBX	1904	119	8-B
KN2HOD	1840	115	8-B
W2YRW	1820	130	7-B
W2JAV	1684	120	7-B
W2RFE	1464	122	6-B
W2EWN	1152	96	6-B
W2DAJ	1130	113	5-B
W2GQO	1000	100	5-B
K2JCV	980	70	7-B
W2SRV	852	71	6-B
W2KHW	848	100	4-B
W2QON	824	103	4-AB
W2EIF	816	102	4-B
K2JVN	736	92	4-B
W2BAY	728	91	4-AB
W2ZUL	658	86	4-B
W2OSD	654	109	3-B
W2JRO	648	108	3-B
W2QBH	642	107	3-B
W2EGP	630	105	3-B
W2NSJ	630	63	5-B
W2LHJ	624	104	3-B
W2EIH	576	72	4-B
W2HEK	574	41	7-B
W2ASG	486	81	3-B
W2EFM	486	81	3-B
W2ORA	470	47	5-AB
W2LFN	390	65	3-B
W2EJH	350	35	5-B
K2DAP	318	53	3-B
W2MGZ	306	51	3-B
KN2KQZ	296	74	2-B
W2VX	282	47	3-B
KN2IHO	260	65	2-B
KN2INQ	260	65	2-B
K2UK	254	64	2-B
KN2JXF	248	62	2-B
W2LYD	240	30	4-B
W2SDO	240	60	2-B
K2DGG	236	59	2-B
W2PFQ	228	57	2-B
K2DWY	220	55	2-B
W2UCV	204	51	2-B
KN2JEI	188	47	2-B
K2DFF	180	30	3-B
W2IRF	176	44	2-B
W2WKI	172	43	2-B
K2AIM	168	42	2-B
W2TQ	164	41	2-B
W2ABQ	160	40	2-B
W2DBP	160	40	2-B
W2FTN	160	40	2-B
W2BDM	156	39	2-B
W2PTX	114	19	3-B
W2HIV	112	28	2-B
W2WTP	108	27	2-B
W2OXV	84	21	2-B
W2SEZ	78	13	3-B
W3ZBN	68	17	2-B
W2FA	24	6	2-B
W2FVR	14	7	1-B
K2AFJ	8	4	1-B

W2NYY/2 (W2S FCB NYY)	1310	67	10-B
W2EBW (W2S EBW EYR)	12	6	1-B

##### *Western New York*

W2ORL	1666	119	7-B
W2AIR	1416	118	6-AB
W2WFB	984	82	6-B
W2UTH	960	80	6-B
K2EPV	652	82	4-B
W2ZOC	480	60	4-B
K2CII	376	37	3-AB
W2RHO	396	66	3-AB
K2DIR	366	62	3-B
W2LXE	280	70	2-B
W2UXP	252	42	3-BC
KN2HIT	240	40	3-B
W2QNA	200	20	4-B
W2QNA	200	20	4-B
KN2IJB	192	48	2-B
W2CTA	162	27	3-B
W2SWC	120	30	2-B
KN2IQD	44	11	2-B
W2BYJ	26	13	1-B

##### *Western Pennsylvania*

W3KKJ	470	47	5-B
W3KWH (W3S MPK UHM			
WHY ZDW, W3NS ANX			
ATG)	612	51	6-AB

#### CENTRAL DIVISION

##### *Illinois*

W9EQC	1476	123	6-BC
W9QNP	1200	100	6-B
W9ZEX	840	84	5-B
W9DRN	736	92	4-BC
W9QKM	664	83	4-AB
W9HJ	596	59	4-B
W9JYC	536	67	4-B
W9ALR	520	65	4-B
W9USI	440	55	4-B
W9MYC	408	51	4-B
W9N9GB*	324	34	3-B
W9MBU	252	42	3-B
W9KCV	172	43	2-B
W9OTV	168	28	3-B
W9CRN	140	35	2-B
W9ADP	80	20	2-B
W9PZP	64	32	1-B
W9CMH	30	15	1-B
W9KLD	12	3	2-B

##### *Indiana*

W9HOC	355	36	5-B
W9BUM	138	23	3-B
W9JYJ	126	21	3-B
W8ILC/9	72	18	2-B
W8FPZ/9	32	8	2-B

##### *Wisconsin*

W9RXS	480	60	4-B
W9GJE	328	41	4-B
W9ELO	280	35	4-B
W9TQ	276	46	3-B
W9NKK	232	29	4-B
W9NMQW*	216	36	3-B
W9ESJ	174	29	3-B
W9BUM	156	26	3-B
W9N9JW	160	15	2-B
W9HJ	40	20	1-B
W9N9JC	40	20	1-B
W9AAX	38	19	1-B
W9UZK	34	17	1-B
W9N9MPY	32	16	1-B
W9N9CM	28	14	1-B
W9N9JF	28	14	1-B
W8SOF	18	9	1-B
W9N9FHT	16	8	1-B
W9HJR	8	4	1-B



A. J. "Tony" Sheppard, VE3DIR, Toronto, made 92 contacts on 144 Mc. in 6 sections, for 1104 points and the Ontario Section award.

## DAKOTA DIVISION

South Dakota

W0RSP...24- 6- 2-B

Minnesota

W0DXY...72- 12- 3-B  
W00FY...14- 7- 1-C  
W00FZ...14- 7- 1-C  
W0MVP...12- 6- 1-C  
W0HPS...10- 5- 1-C  
W0IMG...10- 5- 1-C  
W00Z...10- 5- 1-C  
W0PYC...10- 5- 1-C  
W0HGH...8- 4- 1-C

## DELTA DIVISION

Arkansas

W5HEH...12- 6- 1-B

Tennessee

W4HIK...144- 18- 4-B

## GREAT LAKES DIVISION

Kentucky

W4VLA...384- 64- 3-B  
W4ZPY...36- 14- 2-B  
W4VNH...9- 2- 1-B  
W4HJQ...32- 8- 2-B  
KN4AKT...6- 3- 1-B

Michigan

WSPFU...1236-103- 6-B  
WSPFC...680- 85- 4-B  
WSPSH...430- 3- 4-B  
WSPNOH...480- 40- 6-B  
WSPUMI...400- 50- 4-B  
WSPAAF...350- 35- 5-B  
WSPGHI...285- 45- 3-B  
WSPDIV...270- 45- 3-B  
WSPHJ...45- 3- 4-B  
WSPCVQ...250- 25- 5-B  
WSPGYU...228- 38- 3-B  
WSPDDO...222- 37- 3-B  
WSPJXU...210- 35- 3-B  
WSPHXY...198- 33- 3-B  
WSPHRC...192- 32- 3-B  
WSPARR...76- 19- 2-B  
WSPOKT...24- 12- 1-B  
WNSQZR/8...22- 11- 1-B

Ohio

WSSVI...2044-146- 7-B  
WRLPD...1848-154- 6-ABC  
W8H0H...1260-126- 5-B  
W8LOF...1224-102- 6-B  
W8NRM...736- 92- 4-ABC  
W8SRW...700- 50- 7-B  
W8LXH...660- 10- 3-B  
W8BXA...600- 60- 5-BC  
W8SQFA...594- 99- 3-B  
W8KCM...588- 98- 3-B  
W8KFC...570- 95- 3-B  
W8LIZ...570- 95- 3-B  
W8EAK...562- 4- 8-B  
W8ZCV...527- 88- 3-B  
W8HUX...525- 53- 5-B  
W8SDJ...510- 85- 3-AB  
W8IDL...480- 60- 4-B  
W8SUMF...476- 60- 4-B  
W8LAL...472- 59- 4-B  
W8NSYV...468- 78- 3-B  
W8GFN...438- 73- 3-B  
W8ILC...438- 73- 3-B  
W8CEQ...416- 62- 4-B  
W8LCV...400- 50- 4-B  
W8JWV...396- 66- 3-B  
W8VQL...392- 49- 4-B  
W8HSY...390- 65- 3-B  
W8KTM...366- 61- 3-B  
W8MCW...360- 90- 2-B  
W8MIB...352- 44- 4-B  
W8WRN...328- 41- 4-BC  
W8VMO...324- 81- 2-BC  
W8SEM...272- 68- 2-B  
W8MVL...270- 45- 3-B  
W8NSTL...258- 43- 3-B  
W8SMA...242- 25- 4-B  
W8SQU...246- 41- 4-B  
W8NAF...240- 60- 2-B  
W8N2VU...240- 40- 3-B  
W8WUP...236- 59- 2-B  
W8IUX...186- 28- 3-B  
W8RAL...158- 69- 1-B  
W8JPO...164- 32- 1-B  
W8ODQ...162- 27- 3-B  
W8NSTZ...144- 36- 2-B  
W8AQT...140- 35- 2-B  
W8SDW...138- 69- 1-B  
W8NHW...138- 69- 1-B  
W8NRKJ...138- 69- 1-B  
W8SPU...135- 23- 3-B  
W8IPT...132- 66- 1-B  
W8ZSK...132- 66- 1-B  
W8SRIP...128- 62- 2-B  
W8GGO...114- 7- 1-B  
W8SUK...112- 28- 2-B  
W8BOV...98- 49- 1-B  
W8FV...96- 48- 1-B  
W8SUIT...96- 24- 2-B  
W8NFG...94- 47- 1-B  
W8PLQ...94- 47- 1-B

WSPKS/8...92- 23- 2-B  
WNSUM...92- 23- 2-B  
W8MYB...88- 44- 1-B  
W8YCP...81- 41- 1-B  
W8SNT...80- 40- 1-B  
W8ZPH...78- 39- 1-B  
W8NJS...76- 38- 1-B  
W8PFP...76- 38- 1-B  
W8PQZ...72- 36- 1-B  
W8CEA...70- 35- 1-B  
W8KQY...69- 35- 1-B  
W8PFP...68- 34- 1-B  
W8DMV...62- 31- 1-B  
W8MDK...60- 30- 1-B  
W8ZHI...60- 30- 1-B  
W8NRKL...60- 30- 1-B  
W8ZOF...58- 29- 1-B  
W8NGE...58- 29- 1-B  
W8KWS/8...54- 27- 1-B  
W8OIV...50- 25- 1-B  
W8IFZ...49- 25- 1-B  
W8HTP/8...46- 23- 1-B  
W8RKM...46- 23- 1-B  
W8KID...44- 22- 1-B  
W8ZEM...44- 22- 1-B  
W8RKB...42- 21- 1-B  
K8WBP...42- 21- 1-B  
W8JRN...32- 16- 1-B  
W8STH...32- 16- 1-B  
W8NSDX...32- 16- 1-B  
W8SGK/8...26- 13- 1-B  
W8TDY...24- 12- 1-B  
W8YFJ...20- 10- 1-B  
W8ARN...14- 7- 1-B  
W8INQ...8- 4- 1-C

## HUDSON DIVISION

Eastern New York

KN2HPN/2  
W2PCQ...1072- 67- 8-B  
W2MHE...864- 54- 8-B  
W2ZBS...800- 50- 8-B  
W2AWF...380- 38- 5-B  
W2IP...250- 25- 5-B  
W2GIL...200- 20- 4-B  
W2GPH...12- 2- 2-B  
K2CNP (K2s GCI GIA,  
KN2JXJ)  
K2GCH/2 (K2GCH,  
KN2HPK)  
396- 33- 6-B  
N. Y. C.-L. I.  
K2IEJ/2...2360-118-10-B  
W2FYQ...1596-136- 6-B  
W2LID...1320-110- 6-B  
KN2IBV/2  
W2AOD...1170- 65- 9-B  
W2JNX/2...888- 74- 6-B  
W2JIX/2...780- 65- 6-B  
W2YHP...770- 77- 5-B  
W2QAN...768- 64- 6-B  
W2DIO...670- 67- 6-B  
W2ENW...650- 65- 5-B  
W2EEN...640- 64- 5-B  
W2JBQ...612- 51- 6-B  
W2YSL...496- 62- 4-B  
W2CIN...480- 60- 4-B  
K2DMX...470- 47- 5-B  
K2CMV...424- 53- 4-B  
W2CPI...370- 37- 5-B  
W2TNE...304- 38- 4-B  
W2ODB...276- 46- 3-B  
K2GLN...156- 26- 3-B  
K2BLI...122- 19- 4-B  
K2ESZ...116- 29- 2-B  
W2KJC...114- 19- 3-B  
W2EXE...104- 13- 4-B  
KN2JTS...102- 17- 3-B  
W2PIB...84- 14- 3-B  
KN2BI...68- 17- 3-B  
W2TUK...64- 32- 1-B  
W2SOB...40- 20- 1-B  
K2CFB...34- 17- 1-B  
KN2IBH...32- 16- 1-B  
W2TAL...24- 1- 1-B  
K2EUF...9- 1- 1-B  
W2GGG...8- 4- 1-B  
KN2GSI...4- 2- 1-B  
W2KDO/2 (W2s AZA BNZ  
FSM JGR KDO KEB  
KFV, K2EQH)  
W2HJM (W2s HJM JZT)  
1106- 79- 7-B  
W2RB (W2s RB TUK)  
376- 47- 4-B

Northern New Jersey

W2RGV...5544-231-12-ABC  
K2CMB/2...4960-248-10-BC  
W2AZP...2750-125-11-B  
K2BI...2290-115-10-B  
K2BC...1488-124- 6-B  
W2MM...1458- 81- 9-B  
W2GLO...1302- 93- 7-AB  
W2DZA...1152- 72- 8-ABC  
W2PWX...1080- 54-10-B  
W2IMG...960- 80- 6-B  
W2ISK...930- 93- 5-B  
W2EPM...870- 87- 5-B  
W2ZDR...800-100- 4-B



Nearing the top of Pack Monadnock, near Peterboro, N. H., after 4½ hours of pushing, shoveling, and replacing worn-out cross-links. About to make last chain repair is WLUZ, operator. Onlookers are Butler, Meade and Finan, the last a New Hampshire State fire warden. Fifth member of the expedition was the photographer, W1WID. A total of 216 contacts on 50 and 141 Mc., in 13 sections, netted 5603 points, third highest in the country.

W2CBB...760- 38-10-B  
W2JMI...736- 92- 4-B  
W2QAY...702- 59- 6-AB  
K2DIE...672- 48- 7-B  
W2OAE...630- 63- 5-B  
K2CSM...600- 60- 5-B  
W2PEV...570- 57- 5-B  
K2IMO...500- 50- 5-B  
W2IBM...464- 58- 4-B  
W2NUL...416- 52- 4-B  
W2RQI...384- 48- 4-B  
W2WBY/2...330- 33- 5-B  
W2ZKE...276- 46- 3-AB  
W2ESC/2...264- 44- 3-B  
K2DIF...264- 33- 4-B  
K2AIO...240- 40- 3-B  
W2ESW...192- 48- 2-B  
W2SYR...180- 15- 6-A  
W2IDZ...172- 22- 4-AB  
W2NYB...148- 19- 4-AB  
K2DER...36- 13- 2-B  
W2SCV...12- 6- 1-AB  
K2DO...11- 8- 1-B  
K2CM...10- 4- 2-B  
W2JEP...8- 4- 1-B  
W2YTH...8- 4- 1-AB  
W2YTI...7- 4- 1-A  
W2WCM...7- 4- 1-B  
KN2GLQ...3- 3- 1-B  
W2BDL...2- 1- 1-B  
K2AWY (K2s AWY GLQ)  
530- 52- 5-AB  
KN2KFE (KN2s KFE KNS)  
512- 64- 4-B

## MIDWEST DIVISION

Iowa

W0COP...200- 25- 4-B  
W0GUD...168- 21- 4-B  
W0EMS...144- 18- 4-B  
WN0USQ...28- 7- 2-B

Kansas

W0IJS...126- 21- 3-B  
W0GLN...126- 21- 3-B  
W3IHS/0...60- 15- 2-B  
W0MOX/0...60- 10- 3-B

Missouri

W0NXY...126- 21- 3-B  
W0HID...96- 12- 4-B  
W0DMO...90- 15- 3-B  
W0MOJ...80- 20- 2-B  
W0MPX...80- 20- 2-B  
W0MAQ...68- 17- 2-B  
W0NFF...68- 17- 2-B  
W0MLW...64- 16- 2-B  
WN0YUH...64- 16- 2-B

Nebraska

W0HXX...20- 5- 2-B

## NEW ENGLAND DIVISION

Connecticut

W1HDQ...5681-219-13- ABCD  
W1REZ/1...3336-140-12- 1-B  
W1VLE...3201-146-11-B

W1EIO...2840-142-10-B  
W1VLH...2568-107-12-B  
W1WHN...2280-115-10-B  
W1PHR...2096-131- 8-ABD  
W1UFV/1...2010-101-10-B  
W1TIX...1936-121- 8-B  
W1NANI...1680-120- 7-B  
W1UFW/1...1548- 86- 9-B  
W1YMD...1500-125- 6-AB  
W1VLE...1400-100- 7- ABCD  
W1SPN...1152- 96- 6-AB  
W1HDF...1106- 79- 7- ABCD  
W1RVZ...1078- 77- 7-B  
W1KBI...1064- 76- 7-B  
W1YOB...940- 94- 5-AB  
W1ZDP...900- 90- 5-B  
W1NXY...792- 66- 6-B  
W1NIAQA/1...672- 56- 6-B  
W1AW7...644- 81- 4-AB  
W1ANU...616- 77- 4-B  
W1HND...588- 98- 3-AB  
W1ULY...544- 68- 4-AB  
W1AWX...456- 51- 3-B  
W1VLL/1...480- 60- 3-B  
W1RMI...450- 75- 3-B  
W1VXU...440- 58- 4-B  
W1STU...360- 60- 3-B  
W1URC...352- 44- 4-B  
W1WRG...312- 25- 2-AB  
W1KXM...252- 25- 2-B  
W1NIAES/1...212- 27- 4-B  
W1WRV...208- 52- 2-B  
W1WQO...164- 41- 2-B  
W0JNZ/M...153- 27- 3-B  
W1ASO...152- 38- 3-B  
W1TCW...152- 38- 2-B  
W1KHM...148- 37- 2-B  
W1WEA...144- 36- 2-B  
W1WHR...142- 37- 2-B  
W1NCHT...140- 35- 2-B  
W1CGD...128- 32- 2-B  
W1QJL/1...124- 31- 2-B  
W1WYM...124- 31- 2-B  
W1WIG...120- 30- 2-B  
W1NDGC...120- 30- 2-B  
W1GVK...116- 29- 2-B  
W1TLO...112- 28- 2-B  
W1IDEW...112- 28- 2-B  
W1JBK...108- 27- 2-B  
W1UQK...108- 27- 2-B  
W1UJG...92- 23- 2-B  
W1RFJ...88- 44- 1-B  
W1OLG...84- 21- 2-B  
W1OKT...82- 13- 2-B  
W1IKL...48- 24- 1-B  
W1ZTY...24- 12- 1-B  
W1RON...22- 11- 1-B  
W1VRS...16- 8- 1-B  
W1BDU...14- 7- 1-B  
W1ADW...6- 3- 1-B  
W1QAK/1 (W1s EUG LTZ  
QAK VRR)  
3102-142-11-B  
W1HCU (W1s BGT HCU)  
707- 51- 7-B  
W1UY (W1s TRD YBZ, W2s  
BMF IQB, K2GIO)  
424- 53- 4-B  
(Continued on page 138)

# The World Above 50 Mc.

CONDUCTED BY EDWARD P. TILTON, W1HDQ

Is that new beam up? Rig free of bugs? Converter in apple-pie order? Better get set, for there's a big season coming up. The more than 750 logs received following the 8th V.H.F. Sweepstakes show that activity is developing as never before. Auroral DX in January was the best in years. There were fine tropospheric openings in February. Winter sporadic-E was more widespread and it lasted longer than in any corresponding period for at least five years. Yes, all the signs are pointing to a spring DX season you won't want to miss. It should be breaking out most any time, now. Will you be ready for it?

The activity picture on 144 Mc. and higher bands is bright, indeed, but we could use several hundred new stations on 50 Mc. There were too few 6-meter men on hand to make the winter sporadic-E openings show to good advantage. The winter period is usually over shortly after New Year's Day, but widespread openings were reported through the end of January, and into February in 1955. On January 29th, for instance, W6BWG, San Gabriel, Calif., found the band open at 1555 PST, and was able to work W7DYD, Bothell, Wash., W5MJD, Amarillo, Texas, W0CNM and W0FKY, Grand Junction, Colo., W5KWP, Santa Fe, N. Mex., and W5SIN, Pampa, Texas, in 4½ hours. W5FXX, Austin, Texas, reports an S9-plus signal from W7QNO, Phoenix, Ariz., who was running only 3 watts, and using a 2-element array.

TV DX enthusiasts all over the country had a four-day DX binge beginning the 29th. If sporadic-E DX shows on Channels 2 through 6, 50 Mc. is open over the same, or slightly shorter,

paths. The hundreds of TV DX hounds have shown us one thing for sure: There is a lot more sporadic-E DX than 6-meter men have ever realized, even in the heyday of activity on the band some years back.

Newcomers may not realize how much fun 50-Mc. sporadic-E DX can be, nor have much of an idea of when and how it can be worked. As a result, we find nearly all the new v.h.f. activity on 144 Mc. and higher frequencies, with 50 Mc. getting very little play from the new recruits. So, for them, we pass along a little dope on 6-meter possibilities. If you're an old hand at the 6-meter game, skip over to the fine print; there'll be nothing in the next few paragraphs that will be news to you.

By the time this appears in print, there will be just about time for you to get 6-meter gear going, and an antenna up, before the spring DX season gets under way in earnest. Usually the best months are May, June and July, but we've had some good openings as early as the latter part of March, and we can remember hearing West Coast stations in the latter part of April some years ago. The best signals are usually heard at distances of 600 to 1200 miles, but at the peak of the season (June and July) the skip may get as short as 300 miles, or even less. Multiple-hop propagation brings in stations at greater distances, too, making 50-Mc. WAS a definite possibility, from any point in the country.

DX of this sort shows most frequently in the early evening hours, and thus quite a few chances are missed by fellows who tend to operate only late at night. The morning hours are also good,



V.H.F. Sweepstakes expedition up to Capitol Peak, near Olympia, Wash., by members of the Capitol City Radio Club. The sled is loaded with a 1500-watt generator, gas cans, food, blankets, a 6-element beam and two Communicators. Hikers include W7s POP RKS PVZ, W7N7s WGG VXR YCN and two others whose calls are on the way.



# 50 WAS Mc.

W0ZJB	48	W5VY	48	W9ZIB	48
W0BJV	48	W5GNQ	46	W9QIV	48
W0CJS	48	W5ONS	45	W9HGE	47
W5AJG	48	W5JTI	44	W9PK	47
W9ZHL	48	W5ML	44	W9VZP	47
W9OCA	48	W5SFW	44	W9ROM	47
W6OB	48	W5JLY	43	W9ALU	47
W0INI	48	W5JME	43	W9QKM	46
W1HDO	48	W5VV	42	W9UIA	45
W5MJD	48	W5FAL	41	W9UN8	45
		W5ISC	41	W9MFI	36
W1CLS	46	W5HLD	40		
W1CCY	46	W5HEZ	38	W0QIN	47
W1LL	46	W5FNN	38	W0DZM	47
W1GJO	45	W5LIU	37	W0NFM	47
W1LSN	44			W0TKX	47
W1BMS	43	W6WNN	48	W0KYE	47
W1DJ	41	W6ANN	45	W0JOL	46
		W6TMI	45	W0HYV	46
W2AMJ	46	W6WIS	41	W0MVG	46
W2MEU	46	W6OVK	40	W0WKB	45
W2RLV	45	W6GCG	35	W0TJE	44
W2IDZ	45	W6BWG	30	W0JIS	43
W2FIJ	44			W0PKD	43
W2GYV	40	W7HEA	47	W0PII	41
W2QVH	38	W7ERA	47		
W2ZUW	35	W7BQN	47	VE3AET	43
		W7FDJ	46	VE3ANY	42
W3OJU	46	W7DJD	45	VE3AZ	34
W3NKM	41	W7JRG	44	VE3IB	32
W3MIU	39	W7BOC	42	VE3QY	31
W3OTC	38	W7JPA	42	VE3DER	27
W3KMY	38	W7ACD	42	NE1GE	25
W3RUE	37	W7FTV	41	CO6WW	21
W3FPH	35	W7CAM	40		
W4FBH	46	W8N8S	46	Calls in bold face are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified re- ports.	
W4EQM	44	W8NQD	45		
W4QN	44	W8UZ	45		
W4FWI	42	W8RFN	45		
W4CPZ	42	W8CMS	43		
W4FW	42	W8SOU	43		
W4OXC	41	W8BQF	42		
W4MS	40	W8YLS	41		
W4FNR	39	W8OJN	40		
W4IUJ	38	W8LPD	37		
W4BEN	35				

with midafternoon generally a low point. At the start of the season, openings are frequently short and widely scattered, affecting only small areas at any one time, but from late May through July, sessions may last for several hours, and bring in just about every section of the country. Look for skip to open to the east first, then swing around to north-south, with finally to the west before a good opening dies out. We recall comparing notes one morning after a tremendous June splurge, to find that among three of us who had been on the night before, 37 different states had been heard or worked!

The beauty of it all is that it doesn't take high power or large antennas to work the skip when conditions are good. S9-plus reports are common with just a few watts, though of course the high-power man is able to get in a little sooner, and stay a bit longer, than his flea-powered brother. Ten-watt mobiles with quarter-wave whips can work the DX, and the folded-dipole operator is likely to do almost as well as the big-beam man, when things are at their best. Of the 10 hams who have qualified for the special 50-Mc. WAS award offered by ARRL, not one used a kilowatt rig. They did have perseverance, however, and some knowledge of when and where to look for their quarry.

Probably all of them would agree that, in mak-

ing those 48 contacts, and hundreds of others before and since, they had as much fun as in anything they've ever done in ham radio. Chances are you'll feel the same way about 6 when you've given it a whirl. There will never be a better time to get started than right now!

## Here and There on the V.H.F. Bands

Not all the tropospheric DX is worked in the summer or early fall. The weatherman cooked up a coastal inversion along the Atlantic Seaboard on the night of Feb. 21st that was almost equal to the best that September could produce. It was made to seem all the more exceptional by the presence on 144 Mc. of W1DEO, Cape Elizabeth, Maine, who gave 2-meter men their first contacts with that hard-to-get state for hours on end.

Maine has probably been the most difficult of the New England states for operators down the coast in W2, 3 and 4. It is farthest away, and there has been little consistent activity, with horizontal polarization, and the necessary power, receiver sensitivity and antenna gain to do the job at that distance. If W1DEO keeps up at his present pace, there should be some considerable change in the states-worked standings before long. His best DX on the 21st was W4AO, Falls Church, Va., about 500 miles. This was No. 23 for W4AO.

There's life in the 6-meter band. W0HYV, Pleasant Hill, Mo., managed to work 31 states during 1954, and he heard three others, including Nebraska, which is one of two he needs for 50-Mc. WAS. Gib says that W0s PYK TOQ CKQ and QXT will be on 6 this summer, to help him keep Missouri on the 6-meter map.

Southern New Jersey lost one of its most active v.h.f. stations, and the 420-Mc. band one of its strongest boosters, when W2QED, Seabrook, N. J., closed down for good in February. Ken had been active on 50, 144, 220 and 420 Mc. for more than two years, and had been a potent factor in the 420-Mc. picture along the Atlantic Seaboard for years before that. He was colider, with W8BFQ, of the 420-Mc. record, 360 miles, for a short time in the summer of 1953, and it was through his efforts that the eastern end of the record was passed on to the next holder.

W2QED never missed a v.h.f. contest, and he kept regular morning and evening schedules with scores of stations, and on several bands. One of these was an all-time record for your conductor, a morning check on 144 (and occasionally up to three other bands) daily, that ran for nearly four years, and close to 1000 contacts.

Stations for hundreds of miles in all directions from Seabrook, N. J., will miss W2QED. But the East's loss is the West's gain, for we understand that Ken is bound for the Los Angeles area, where he will find plenty of opportunity to continue his fine work in the world above 50 Mc.

Two other famous stations are reported to be on the verge of dismantling for major moves. W2UK will be closing down in a few months, and W8BFQ-WJC is reported to be moving southward. It will take a lot of operating and antenna work to fill the gaps left in the v.h.f. bands by the departure of these stalwarts!

Another well-known call about to be heard in a new locality is VE3ANY. Gordon has taken up permanent residence in the Detroit area, and will soon be heard on the v.h.f. bands operating under his old call with a reciprocal permit from FCC.

V.h.f. operators of the Houston area have formed the 144 and Up Club, for the purpose of promoting activity and interest in v.h.f. work. This grew out of a V.H.F. Round-up held last fall. Quarterly contests are planned, the first to begin April 1st. The next meeting of the group is planned for the West Gulf Division ARRL Convention, to be held in Ft. Worth, June 10th to 12th.

We have notes from several groups and individuals this month who make the same plea: "Please let the gang know that we are on the air here, and ask them to turn their beams in our direction once in a while." K4AMX, Winston-Salem, N. C. (formerly W1ACG, Lexington, Mass.), says that he works W4NHW in Greensboro and W4CVQ, Raleigh, N. C., almost nightly, but would like to hear from other stations to the north, west and south. The Winston-Salem C.D. Net operates on 147.15 Mc. each Tuesday and Thursday night at 2000 with W4CPI as control station.

VE6HY writes on behalf of the Calgary Amateur Radio Association that there are about 15 stations on 147.6 Mc. in that area. They would like to hear from W7s who may be within operating range.

The Davidson County (middle Tennessee) 2-Meter Net meets Monday and Thursday at 1930 CST, with W4OEZ, Nashville, as NCS. Alternate is W1TFU. Average number checking in is about 10. Vertical polarization is used in net activities.

K6GKX, Long Beach, Calif., writes that Thursday and Friday nights are set aside for round-tables on 220 and 420 Mc. Use of both bands is on the increase, with W6s SSB ZW OCU and NIT, particularly, deserving credit for their efforts in popularizing these bands.

Anyone for 220 Mc. around Williamsburg, Va.? W8LTF/4 has been operating on 220.1 Mc. with a converted ARC-5, but has found nobody to talk to as yet. A 4X150A with changeable tank circuits for 220 and 420 is in the works.

Have you heard any single sideband on 144 Mc.? Elsewhere we report that W7JRG has finally given up on s.s.b. on 50 Mc., because so few fellows recognize it when 6 is open, but W2JJC, New Market, N. J., has been doing quite well with s.s.b. on 144 Mc. His power level is now about 100 watts output, from a pair of 826s, running in the AB2 region. W2JJC's best DX so far is W1RFU, and very nice reports are being received from distances up to 100 miles or so in other directions. As almost everyone uses a crystal-controlled converter on 144 Mc., there is no stability problem in receiving the 2-meter s.s.b., and quite a few listeners have reported the readability holding up remarkably well under conditions when a.m. signals are fading into the noise. A few checks your conductor has made with W2JJC indicate that the readability is considerably better than a.m. of comparable power level. Watch for W2JJC on 144.39 Mc.

Should there be an exclusive c.w. assignment in the 144-Mc. band? Quite a few fellows think so, and at least one has petitioned FCC to set aside a segment at the low edge of the band for c.w. operation only. There are several good arguments in favor of such a move, and probably few against it, though talk of such things invariably stirs up a hornet's nest. With the amount of activity now heard in many areas, the QRM problem is getting fairly severe on 2, particularly at the low edge. It takes only a few strong 'phone signals to fill the first 100 or 200 kc., to the point where any DX signal is well-nigh obliterated. Proponents of the c.w. assignment idea say that moving up 100 or 200 kc. would work no hardship on any voice operator (we all have crystals for higher in the band, but we have dropped using them in most cases) but it would help to free a lot of territory for weak-signal DX operation, and make it easier for everyone.

Perhaps the alternative to legislation would be for us to do our rag-chewing above 144.2 Mc., by mutual agreement, and leave the low edge for c.w. DX work and special skeds. Anyone can QSY 200 to 500 kc., usually without any retuning. Let's do it more often, and give everyone a better break.

Remember, please, that the way to get ARRL action for or against a proposal that involves regulation changes is to work through your director, not through the Headquarters office. We'll be glad to hear opinions, but your ARRL director is the only man who can do anything about the matter. Be sure that he knows how you feel.

## Corrections, September V.H.F. Party Report

Following publication of the results of the September V.H.F. Party in January QST, we heard from several contestants whose work was improperly reported, or skipped entirely. Two Iowa logs never showed up at all, and both of them were the best that the participants had ever sent in. So, belatedly, we announce that W9GUD was top man in that section, with 78 contacts in 11 sections, for 858 points. W0EMS ran him a close second. And we did W7RT wrong in crediting him with exactly half his score. His multiplier was 4 instead of 2, bringing his total to 212, and moving him to third place in the Washington Section.

## OES Notes

W1KCS, Providence, R. I. — Antennas for 50, 144, 220 and 420 Mc. back up after heavy damage in last fall's hurricanes. Results in V.H.F. SS best on record. Note to those

## 2-METER STANDINGS

Call States Areas Miles				Call States Areas Miles			
W1RFU	19	7	1150	W6BAZ	3	2	320
W1HHDQ	19	6	1020	W6NIZ	3	2	360
W1CCU	17	5	670	W6AMU	2	2	240
W1IZY	16	6	750	W6GCG	2	2	210
W1HEO	16	5	475	W6QAC	2	2	200
W1UTZ	15	6	680	W6EXH	2	2	193
W1AZK	11	5	650				
W1MNF	14	5	690	W7VMP	4	3	417
W1HCN	14	5	650	W7JL	3	2	247
W1KCS	14	5	540	W7LEE	3	2	240
W1DDK	13	5	520	W7YZL	3	2	240
W1MMN	10	5	520	W7JCO	2	2	140
				W7RAP	2	1	165
W20RI	23	8	1000				
W21KC	23	7	1075	W8BFG	29	8	850
W2NLY	23	7	1050	W8WXA	28	8	1200
W2AZL	21	7	1050	W8WJG	25	8	775
W2QED	21	7	1020	W8RMH	22	8	690
W2BLH	19	7	910	W8DX	22	7	675
W2OPQ	19	6	—	W8SRW	20	8	850
W2DWJ	17	5	632	W8SVJ	20	7	670
W2AOC	17	5	600	W8WRN	20	8	865
W21TH	17	7	880	W8BVA	20	8	670
W2PAU	16	6	740	W8JWV	18	8	650
W2PCQ	16	5	650	W8SEP	18	7	800
W21HJ	15	5	550	W8ZCV	17	7	970
W2CCT	15	5	525	W8RWV	17	7	630
W2DFV	15	5	—	W8SWE	16	7	830
W2AMJ	15	5	550				
W2QNZ	14	5	400	W9EHN	23	7	725
W2BRV	14	5	590	W9FVJ	22	8	850
				W9EQC	22	8	820
W3RUE	23	8	950	W9KLR	21	7	690
W3KNM	19	7	660	W9BPV	20	7	1000
W3IBH	19	7	650	W9UCH	20	7	750
W3BNC	18	7	750	W9KPS	19	7	660
W3FPH	18	7	—	W9MUD	19	7	640
W3TDF	17	6	720	W9REM	19	6	—
W3WVL	16	7	720	W9LF	19	—	—
W3LNA	16	7	720	W9ALU	18	7	800
W3TDF	16	5	570	W9JCA	18	6	720
W3GKP	15	6	800	W9WOK	17	6	600
				W9ZHL	17	6	—
W4HHK	26	8	1020	W9MBI	16	7	660
W4JAC	23	7	950	W9BOV	15	6	—
W4PCT	20	8	—	W9LEE	15	6	780
W4JFY	18	7	830	W9SEP	15	6	760
W4MKJ	16	7	665	W9JNZ	15	6	560
W4UMF	15	6	600	W9DDG	14	6	700
W40XC	14	7	500	W9FAN	14	7	680
W4JHC	14	5	720	W9KMI	14	6	620
W4WCB	14	5	740	W9GAB	14	6	570
W47CR	14	5	720	W9TIA	12	7	540
W4UBY	14	5	435	W9ZAD	11	5	700
W41KZ	13	5	720	W9GTA	11	5	540
W4JFU	13	5	720	W9JBF	10	5	760
W4ZBU	10	5	800				
W4TDQ	10	5	850	W0EMS	26	8	1175
W4DWU	8	6	625	W0IHD	24	7	870
W4TLA	7	4	850	W0MUD	22	7	1065
				W0ONQ	21	7	1090
W5RCL	21	7	925	W0INI	14	6	830
W5JTI	19	7	1000	W0OAC	14	5	725
W5QNL	10	5	1400	W0TJF	13	4	—
W5CVW	10	5	1180	W0ZJB	12	7	1097
W5AJG	10	4	1260	W0WZG	11	5	760
W5MWW	9	4	570				
W5ML	9	3	700	VE3AIB	20	8	890
W5ABN	9	3	750	VE3DIR	18	7	790
W5ERD	8	3	570	VE3BQN	14	7	790
W5VX	7	4	—	VE3DEF	13	7	800
W5VY	7	3	1200	VE3BPP	12	6	715
W5FEK	7	2	580	VE2AOK	12	5	550
W5ONS	7	2	950	VE3AQG	11	7	800
				VE1QY	11	4	900
W6ZL	3	3	1400	VE7JF	2	1	365
W6WSQ	3	3	1390				

needing Rhode Island QSLs: W1KCS now has stock, and will supply to all stations worked, upon receipt of QSL or note giving date of contact.

W2UTH, Victor, N. Y. — 144-Mc. signal of W1HHDQ, 260 miles, heard every Saturday morning on schedule through winter. No complete failures, though sometimes too weak for effective two-way communication.

W2UXP, Webster, N. Y. — Having fine QSOs on 220 Mc. with W2POM, W2MIH and K2CEH. Tripler-amplifier for 432 Mc., with 9903s, finished and crystal-controlled converter work along.

W3UQJ, York, Penna. — A winter of regular operation on 220 Mc. has indicated that good year-round results could be obtained on that band if more stations were using it. Coverage seems to be comparable to that generally obtained on 144 Mc. Even very low power does well if a good antenna system is used. Schedules have been kept regularly with W4UMF, Arlington, Va., over 80 miles of irregular terrain, using only 8 watts.

(Continued on page 142)

# Simulated Emergency Test—1954 Model

*Genuine Emergencies Compete with Emergency-Preparedness Plans  
To Make the 1954 SET Realistic*

BY GEORGE HART, WINJM

THE SET had a lot of competition this year, especially in the East. Those AREC groups who were not girding for the next hurricane were recovering from the last one. In Indiana, a tornado or two wiped out a couple of towns and all SET plans with it. In other places also, Old Dame Nature cooperated pretty well with us, this year, to take the "simulated" out of SET, and put the gang to the real test.

Many of the AREC organizations so afflicted simply did not feel like putting on an SET on top of all their other labors in connection with the real emergency, and we don't blame them. Others submitted the regular SET form, but crossed out the word "simulated" and reported their operation in the real emergency. After giving the matter some thought, we have decided that those who did this should certainly receive credit for participating in the SET. After all, what can be better practice for operating in an emergency than operating in an emergency?

All this hullabaloo, of course, put a crimp in our over-all SET participation. Of our 1700-odd ECs, 142 reported participation in the SET. Fifty-eight of these chose to conduct their SETs at dates other than the October 9th-10th week end, ranging from October 3, 1954, to February 22, 1955. Several ECs indicated that no SET was held because they felt it unnecessary in view of regular drills in their emergency program.

Twenty-nine groups bettered their 1953 score,

and twenty-four fell short. This makes 53 who had an SET in 1953 who repeated the process in 1954, leaving 89 new reporting groups. This about follows the pattern of previous years participation of repeaters and new groups in the SET.

Traffic on the long-haul circuits was light, due to the decrease in participation and the increasing tendency of AREC groups to take advantage of the latitude in dates. Seventy-seven ECs reported their SET participation, or lack of it, by radio. All but one of these were received at Headquarters by radio.

The Test Emergency Alert, an innovation in our annual SET, went over "like a lead balloon." The transmission was made from W1AW only, by 'phone at 2030 EST on October 9th, on four National Calling and Emergency 'phone frequencies (3875, 7250, 14,225, 21,400 kc.) and at 2100 EST by c.w. at 18 w.p.m. on four NCE c.w. frequencies (3550, 7100, 14,050, 21,050 kc.). Sixteen amateurs reported reception of the message. Six of them sent in 100% correct copies after having confirmed reception by radio as instructed in the TEA message itself. The winners: W1BDI, W1CRW, W4BAQ, W4YZE, W8CCN, W0N1Y. Three amateurs sent messages confirming reception, but the mail copies turned out to be incomplete: W4COY, W8AQ, VE2HD. W4ERK's copy, by mail only, was also imperfect. The following confirmed reception by radio but did not send in copy: W1CWX, W1LKP, W1-

This is the communications control center for the city of St. Lambert, Que., as it was operated during the SET. It is operated under the call VE2ADN, of the South Shore Amateur Radio Club. There are four amateurs in the picture: EC VE2KG (standing) and seated, starting from the left, VE2TE, VE2CA and VE2NY.



QMB, W4BUA, W4CZR, W4WXZ. We thank all for participating in this test: you all rate honorable mention and an E for Effort even if you didn't copy 100%. Many of those who copied the TEA did so only because they left receivers tuned to one or the other of the NCE frequencies all the time, to be sure not to miss it. Many others reported monitoring for hours at a time without success.

Maybe we're just obstinate, but we still think the TEA is a worth-while part of the SET. What do you think? At the moment, we're planning to try it again in 1955, but we can be talked out of it.

Here's the annual breakdown of the SET by participating groups: Figures in parentheses are comparative figures from last year:

<i>Total reports of activity:</i>	142 (180)
<i>AREC members in areas reported:</i>	3635 (5531)
<i>Total known participation:</i>	2252 (2522)
<i>Mobiles &amp; portables:</i>	999 (1149)
<i>Fixed stations on emerg. power —</i>	164 (200)
<i>Messages from participants to ECs —</i>	1365 (1841)
<i>EC radio reports to ARRL:</i>	77 (116)
<i>Total points:</i>	18,369
Abilene, Texas (W5VFH) <sup>1</sup>	104
Adams, Brown, Pike & Schuyler Counties, Ill. (W9AEX) <sup>2</sup>	80
Albany Co., N. Y. (W2AWF) <sup>33</sup>	201
Allen Co., Ind. (W9BEM)	216
Amesbury, Mass. (W1ICU) <sup>3,33</sup>	77
Asotin Co., Wash. (W7HDT)	41
Auburn-Opelika, Ala. (W5ONL/4) <sup>4</sup>	105
Bakersfield and East Kern Co., Calif. (W6TXM) <sup>5,33</sup>	94
Beckham Co., Okla. (W5UCK) <sup>6,33</sup>	149
Bedford, Mass. (W1RSY) <sup>7</sup>	190
Belleville, N. J. (W2JYW) <sup>8</sup>	49
Belleville Dist., Ont. (VE3AUC) <sup>6,33</sup>	74
Bergen Co., N. J. (W2CYF) <sup>3,33</sup>	984
Berks Co., Pa. (W3BN)	141
Berrien Co., Mich. (W8FGB) <sup>33</sup>	145
Bibb Co., Ga. (W4LXE) <sup>32</sup>	—
Billings, Mont., area (W7KGF)	133
Bloomfield, N. J. (W2ZPD) <sup>8</sup>	113
Bozeman, Mont. (W7ED) <sup>9</sup>	55
Bristol, Tenn.-Va. (W4IYT) <sup>33</sup>	122
Broward Co., Fla. (W4PPR) <sup>33</sup>	184
Burlington Co., N. J. (W2UA) <sup>32</sup>	—
Carlton & Pine Co., Minn. (W0IRJ) <sup>10</sup>	44
Cedar Rapids, Iowa (W0HDX) <sup>11,33</sup>	307

<sup>1</sup> Nov. 9. <sup>2</sup> Oct. 12. <sup>3</sup> Oct. 13. <sup>4</sup> Nov. 7. <sup>5</sup> Oct. 22. <sup>6</sup> Oct. 17. <sup>7</sup> Aug. 31 & Sept. 11, credit for participation in Hurricanes Carol and Edna. <sup>8</sup> Oct. 19. <sup>9</sup> Feb. 22, 1955. <sup>10</sup> Oct. 27. <sup>11</sup> Oct. 24. <sup>12</sup> Oct. 26. <sup>13</sup> Oct. 15. <sup>14</sup> Asst. EC making report; no points calculated. <sup>15</sup> Oct. 21. <sup>16</sup> Oct. 14. <sup>17</sup> Oct. 31. <sup>18</sup> Oct. 15, credit for participation in Hurricane Hazel. <sup>19</sup> Oct. 28, 29 & 30. <sup>20</sup> Credit for hurricane participation, Sept. 10-11. <sup>21</sup> Credit for participation in tornado emergency, Oct. 11. <sup>22</sup> Oct. 18. <sup>23</sup> Oct. 25. <sup>24</sup> Oct. 3. <sup>25</sup> Oct. 11. <sup>26</sup> Oct. 9-17, combined report of all ECs in Nassau Co. <sup>27</sup> Nov. 1. <sup>28</sup> Oct. 23. <sup>29</sup> Oct. 30. <sup>30</sup> Oct. 16. <sup>31</sup> Oct. 4. <sup>32</sup> Reported active, but no point total calculated. <sup>33</sup> Bettered last year's score.

Centinella Valley, Calif. (W6OD) <sup>12</sup>	107
Chambly, Laprairie, Vercheres Counties, Que. (VE2KG) <sup>13,33</sup>	315
Charleston, S. C. (W4TWW) <sup>14</sup>	—
Clinton Co., Ind. (W9SKP)	114
Cobb Co., Ga. (W4WRV)	95
Columbia Co., Fla. (W4YNM)	64
Colusa, Calif. (K6CFZ)	25
Cuyahoga Co., Ohio (W8AJH)	402
Dade Co., Fla. (W4IYT) <sup>33</sup>	415
Daytona Beach, Fla. (W4RWM) <sup>2</sup>	74
Davies Co., Ky. (W4VJV)	86
Douglas Co., Minn. (W0GTX)	81
Duluth, Minn. (W0EJG) <sup>6,33</sup>	191
Dutchess Co., N. Y. (W2HZZ)	135
Duval Co., Fla. (W4UHY) <sup>6</sup>	161
E. Los Angeles, Calif. (W6RNN) <sup>15</sup>	107
Elko Co., Nev. (W7PEW)	47
Erie Co., Pa. (W3QN) <sup>6,33</sup>	229
Everett, Mass. (W1PJ) <sup>16</sup>	92
Fanwood, N. J. (W2IXP)	61
Fort Worth, Texas (W5CVA) <sup>17</sup>	484
Framingham, Mass. (W1MEG)	60
Frederick, Md. (W3WN) <sup>18</sup>	54
Fresno Co., Calif. (W6JPU)	75
Fulton & DeKalb counties, Ga. (W4LXR)	240
Genessee Co., Mich. (W8FPO)	150
Goose Bay Area, Labrador (VO6U) <sup>16</sup>	80
Great Falls, Mont. (W7DSS)	129
Groveland, Mass. (W1MRQ) <sup>33</sup>	45
Hamden, Conn. (W1NFG) <sup>19</sup>	193
Hampton, Va. (W4AJA) <sup>20</sup>	86
Harford Co., Md. (W3LDD)	87
Haverhill, Mass. (W1SIX)	141
Hobbs, N. M. (W5CEE)	45
Howard Co., Ind. (W9DKR) <sup>33</sup>	68
Huntsville, Ala. (W4TKL)	130
Iroquois Co., Ill. (W9HKA)	32
Jackson, Tenn. (W4AYQ) <sup>32</sup>	—
Johnson Co., Ind. (W9KNI) <sup>21</sup>	27
Kingsport, Tenn. (W4CBU) <sup>6</sup>	167
Lake Co., Ohio (W8OXS)	132
Laurel, Mont. (W7LBK)	122
Lawrence Co., Ind. (W9WHL)	21
Long Beach, Calif. (W6QGT) <sup>22</sup>	298
Lucas Co., Ohio (W8HNP) <sup>33</sup>	379
Mamaroneck, N. Y. (K2ASQ) <sup>23</sup>	68
Manchester, Conn. (W1FSH)	98
Manitowoc Co., Wis. (W9RKT) <sup>24</sup>	87
Marion, Monongalia, Preston Counties, W. Va. (W8JWX)	63
Marshall Co., Ind. (W9AYB)	37
McKean Co., Pa. (W3LQQ)	29
McKenzie, Tenn. (W4BQG) <sup>25</sup>	36
Mecklenburg Co., N. C. (W4ZQB)	198
Medford & vicinity, Ore. (W7ISP) <sup>25</sup>	50
Memphis & vicinity, Tenn. (W4BAQ) <sup>33</sup>	283
Menominee & vicinity, Mich. (W8QCQ)	61
Merced, Calif. (W6ZJR) <sup>32</sup>	—
Mercer Co., Pa. (W3CJF)	44
Mitchell, S. Dak. (W0GCP) <sup>12</sup>	—
Monroe, La. (W5MWE)	75
Monroe Co., N. Y. (W2QY)	111
Morgan Co. & vicinity, Ala. (W4BFM) <sup>33</sup>	66
Morgan Co., Ind. (W9DUD)	37
Nassau Co., N. Y. (W2GI) <sup>26,33</sup>	1049
New Bedford, Mass. (W1AVY)	38
New Orleans, La. (W5INL) <sup>2</sup>	88

(Continued on page 136)



The Amesbury, Mass., control station was set up at the School Street Fire Station. That's W1RYJ at the mike, with W1ZFZ on her right and EC W1ICU on her left. Standing, l. to r., are W1DON and W1UHL.



# How's DX?



CONDUCTED BY ROD NEWKIRK,\* W9BRD/9

## How:

We came to the end of the business portion of our first post-DX Test club meeting and the boys sat back for the usual informal finale of our monthly get-together. Inasmuch as two of our gang were being evicted by their landlords, tonight's discussion appropriately was titled "How to Select a DX QTH."

Chairman Bandsread McSwindle, who has 715 feet of 20 meters on the dial of his homebrew superhet, first called upon Cunningham Plotch, our most recently established 200-country man. Cunningham's explanation for his shack's location was disappointing: "Shucks, the XYL liked all the closet space."

McSwindle then tackled Skeds Stamplicker, a guy who earned his DXCC the hard way with 12.3 watts input and a scratchy receiver volume control. Skeds' reply didn't bring the house down, either: "Gee, the best pizzeria in town is right across the street and they don't deliver."

Next came the uninspiring lowdown on why Bugbeater Butterby has a shack on the top floor of a bowling alley: "Won a suit against the place for bruises suffered while working as a pinboy." Also how come Svishy Svensen keeps his station in the back of his fish store: "The tuna vat makes a good ground for an 80-meter vertical." (A paradox becoming evident was that all these birds with crummy QTHs were the most active and eager DX men in the club!)

Well, we all began to realize that we were getting nowhere speedily. The discussion was turning out to be as constructive as a rubber crutch. But just as disgusted Chairman McSwindle was about to adjourn the session and forget the whole thing, in walked Acres O'Green, late to another meeting as usual.

Now everybody knew that Achy had the best DX QTH in the club. Brother, *what* a spot. And, sure enough, when Bandsread asked him about it Acres described in glorious detail how he went about selecting such a marvelous location. He had called in seven communications engineers who took noise and f.s. readings all over the place. The ground conductivity was investigated by three other specialists. Surveyors checked the elevation and general topography for miles in every direction. Acres left nothing to chance and no propagational pebble remained unturned.

After several months of such monkey business Acres built a bungalow on the stake and installed a classy shack. All his pains were worth the effort — man, did that boy *get out*. Any old time Achy tapped his key or whispered into his mike

the ZC3s and VQ9s came back on their hands and knees.

O'Green concluded his lecture with the orthodox "Any questions?" and somebody up front came through with the natural one: "Say, Achy, tell us how many multipliers you piled up in the Test, huh?" Our guest of honor by default scratched his chin, thought a moment, then looked uncomfortable.

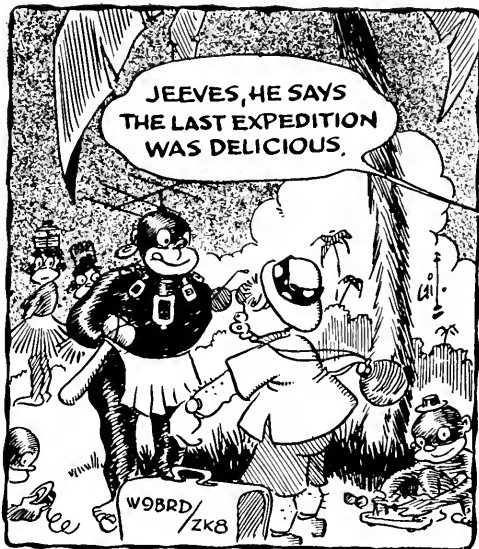
"Well, fellows — ah-h — decided to do a little rebuilding, you know. That was in 1952, come to think of it. Then somebody loaned me a couple of LP records and I kinda got hopped up on hi-fi. Haven't gotten around to finishing up the rig. And that reminds me — I've just come from my monthly meeting of the Beehop Lovers of East Podunk. I'm president, you know, and the club wanted me to tell you birds to get your darned harmonics the heck off WOOF-FM on Sunday afternoons. . . ."

Bandsread McSwindle himself led the sturdy little band that picked up Acres O'Green, handed him his Homburg and neatly heaved him out the door.

## What:

But, as McSwindle observed on the way home from that meeting, O'Green will be back. They *always* come back. And sure enough, Achy could be heard going after ZDSAA and PJ2MA on 20 and 40 with his exciter the following night.

Some of the vast treasure hoard on Cocos Island was freely ladled out by T19MHB beginning early in February. Not material wealth, that is, but QSOs by the thousands, contacts with one of the rarest entities on the ARRL DXCC Countries List. W6MHB officiated in this charity, ably assisted by a Viking rig, NC-183 and HQ-120 receivers, and a few bulky spools of hard-drawn copper. T19MHB aimed



\* New Mailing Address: Effective immediately, please mail all reports of DX activity to DX Editor Newkirk's new address: 4128 North Tripp Ave., Chicago 41, Illinois.

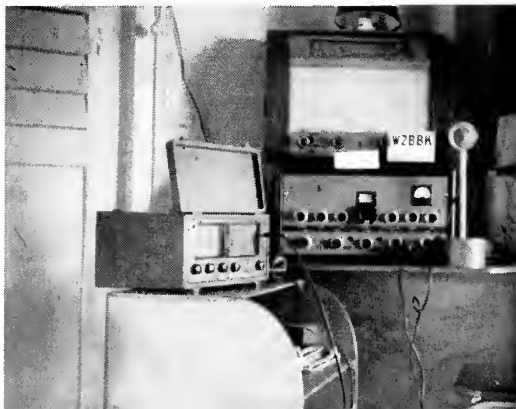
for 10,000 A1 and A3 QSOs on 10 through 160 meters and was operated in ideal maximum-contacts-per-hour fashion. Whether or not the hunt for cached doubloons and pieces of eight pays off, the hamming aspect of this venture stands an unqualified success.

Twenty 'phone, now, if you please. **CR7CF** 20-21, **ET2US** (183) 17-18, **HZ2AEH** 17, **TF5SV** (114) 15-22, **VPs** 2KM (197) 17, **8AQ** (100) 23-0, **VQ8AR** (150) 14-20 and **YI2AM** (145) 12-14 leveled **W4CBQ** off at 108. . . . . New p.p. s10s and **ZD3BFC** (109) 23 made it 162 for **W9BVX** . . . . . **W9WHM** raised **E9AR** (325) 20-21, **FP8AP** (348) 21, **GD3ENK** (190-200) 15-18, **HK0AI** (150) 21, **KS4AW** (225) 7, **3V8BL** (225) 21 and **4X4AS** (150) 0 to reach No. 105. . . . . **VO6U** mentions **ST2DB** 20-21, **VP2DA** (121) 22, **VQs** 2DT (187) 19-23, **3ES** 18-19, **ZB1CA** (134) 15-20 and **3V8AS** (195) 19-21. . . . . So Calif. DX Club's *Bulletin* recommends 14-Mc. A3ers **CR6AC** (126) 21, **CS3AC** (183) 20, **EAs** 8AI (175) 15, **9AP** 15, **9DQ** (135) 10, **EL2X** (109) 21, **FB8BM** (199), **FD8AA** (175) 21, **FF8BB** (137) 23, **FQ8AK** (130) 21-22, **Gds** 3IBQ (155) 15, **6IA** (150) 16, **KB6AQ** (274) 1, **KP6AK** (217) 0-1, **KR6AZ** (277) 1, **MP4QAI** (140) 15, **OE13JM** (124) 15-16, **OQ5GM** (130) 21-22, **PI1J** (166) 6 just Holland, **SV0WK** (150) 15, **VK9RH** (137) 18-19, **VPs** 2DL 5AE (146) 21 of Turks, **VQs** 2FU 18, **3RJVB** (142) 20, **6LQ** (150) 5, **8CB** (100) 6-15, **YU1s** AD (142) 15, **GM** (113) 15-16, **ZC3AC** (160) 11, **ZDs** 4HF (115) 23, **9AC** (140) 19-20, **ZP5s** DY (210) 1, **GF** (195) 1, **IB** (144) 0, **ZSs** 2MI (150) 20 of Marion Isle, **7A** 7B 8E 9F, **4S7YL** (142) 14-15, **5As** 1TA (196) 0-1, **4TL** (146) 16-17 and **4TR** (125) 16. . . . . West Gulf DX Club's *DX Bulletin* spills the 'phone beans on 20-meter men **CR5NC** (199) 23, **EAs** BA (152) 14, **BQ** (130) 19-20, **FE8AE**, **FL8AI** (150) 16-17, **FM7s** WF (127) 21-22, **WN** (124) 15-16, **FY7YE** (115-150) 21-22, **GC6FQ** (158) 15, **MIB**, **TG9MB** (155) 16, **UA3CR** (132) 15, **VK9OK** (155) 7, **VPs** galore, questionable **WQ1MP** 21-22, **YS1MS** (167) 16, **ZB1AJX** (109) 18, **ZDs** 4BR (116) 22, **9AB** (170) 23, **ZS8I** (100-340) and **4X4BG** (109) 20. . . . . *Newark News* Radio Club slapped headphones on 14-Mc. voices **CE0AD**, **CN2AD** (115), **CR6AJ**, **DUIAL** 15-16, **EAs** 9BC (265), **0AB** (110) 22, **EL9A** (240), **FB8BN** 22, **FF8AL**, **FQ8AK**, **FQ8AW**, **GC4LI**, **HI6EC**, **KAs** by the mitful, **KA0IJ** (190) 23 of Iwo Jima, **KGs** 4AR 6FAA, **KR6s** AF 23, **KS** PW, **KTIW**X (190), **KV4AQ**, **MP4KAC** 14, **OD5As**, **OQ5s** EB (135), **EC** FF (110), **FO** GM OH (250) 20, **RU** (230), **OQ0DZ**, **PJ2s** AF AK AO 2, **AP** (160), **CH** (141) 19, **TG9AJ**, **VPs** 1AB 2LF 7NN, **VQ4AQ** (163) 19, **VRs** 4LP 6AC (320) 20-21 of Pitcairn, **VS2s** CT 12, **EB** 16, **YNs** 1AFM 4CB (205), **4DQ** (227), **ZEs** 2KI 2KN 20, **4JA**, **ZS3s** AH E, **4X4DK**, **5As** 1TC (170), **2TZ** (150) 17-18 and **4TY** (150), all these times Greenwich.

Twenty c.w. emerged from the annual ARRL DX Test battered but unbowed. **CR5s** AF JB (78) 20, **DUs** 1CV (65), **7SV** (27) 0, **FG7XB** (28), **SV0WL** (90) 13, **UB5KBE** (60) 14, **VS2CR** (42) 14-15 and **VE2EJ** (50) swapped notes with **W8EV**. . . . . **DL4ZC** collected **FB8BR** (50-100) 16-18, **VQ3CF** 15, **YV5DE** 15 and **ZS9I** 19. . . . . Choice plums **CT3AB** (35) 9-20, **DUI1DR** 15, **EL2s** P (47) 15-19, **X** 19, **FF8AJ**, **FP8AP** (25-73) 13, **FQ8AX**, **FR7ZA** (18) 16, **HRIAT** 19, **KC6CG** (52) 17, **MDs** 5FA 7AB 17, **VP7MI** 20, **VQ5EK** (30) 14-19, **VSs** 1FE 1GK 2EG 15, **VU2s** CP JP (80) 15-16, **YS1O** 17-18 and **ZD4BQ** (78) 18-21 are among **ZD6BX's** harvest. . . . . **W2HSZ**, confidant of

Count U. R. Kunties, did well with **CRs** 4AL 6AI (59) 21, **6CJ** (11) 19, **7LU**, **FF8BF**, **FM7WMI**, **FQ8AG**, **OQ5HI**, **OX3UD**, **TF3BM**, **VQs** 2AS (72) 19, **2JN** 4FG, **YNI**PM, **ZD4BM** (80) 18, **ZE3JL** (35) 19-20 and **ZS3AH** to reach postwar 154. . . . . **FB8BE** (61), **KW6BB** (104), **LB1LF** (21), **ST2GB** (10-76) 20, **VQ3s** FN (54-68) 20, **JTW** (23) and **ZS7D** (7-28) 19 worked **W9TGY** to 138/110. . . . . It's 121/107 at **W9UKG** thanks to **EL2C** (80) 22, **ET3S** (84) 20, **FY7YE** (35) 13, **HA5KBA** (64) 17, **SP3PK** (20) 15 and a **ZD4**. **OY4XX** (20) 17 got away. . . . . **W9AMM** did a grab on **EL9A**, **Togoland's** **FD8AA** (10-94) 14-17, **KAs** 2USA 9MF, **JAs** 3AF 3FG 6AD 8AQ, **OQ5CP** (50) 21, **SP2KAC**, **SV0WO** and **ZB2A** (40) 18-19. . . . . **E9AP** (19) 16-19, **IT1TAI** (70) 19, **OD5AV** (30) 5, **OX3SL** (60) 17, **VQ4FK** (5) 19, **YI2AM** (60-80) 15-21, **ZB1JRM** (7) 20-21, **9S4AX** (2-12) 15-19 and others fell prey to **W4TFB**. . . . . **W4ZAE's** new cube quad will have trouble improving on **CR6CZ** (30) 21, **FF8BB** (21-68) 19, **FM7WP** (14-22) 15, **KR6KS** (15), **VP2GW** and **ZE6JB**. . . . . **W4JBQ** caught **EAs** 6AF of Balearics, **9DF**, **OQ5GU** (9) 23, **YO4CR**, **ZE3JO** and a **ZS7** for a 112/88 total. . . . . At **K6ENX** we find **OA4ED** (15) 1, **PJ2AD** (50), **TF3KG** (30-70) 19-21, **VP8BF** (60) 1 and **V56CR** (30) 1. . . . . **EAs** 8C BF (40) 21-22, **GC2CNC**, **HP1BR**, **OY2Z** (55), **SP3PK**, **TF5SV** (40) 22, **VQ2HR** (29) 10 and **ZB2I** (10-30) 19-21 brought **W3UXX** past the century. . . . . **15LV** (95) 20, **VQ8AY** (58) 18 and **ZD6EF** (55) 19 looked mighty good to **W4EPA**. . . . . **CR7CN** (10-69) 21, **ET3GB** (10-55) 18, **KA2USA**, **OY2A** 5-75 16, **SV1AB** (60) 19, **VQ2W** (50) 20, **YO3RF** (61) 17 and **ZB1CH** (67) 22 were booked by **KB2TZ**. . . . . **W5VIR** worked **FF8CG** (40) 23-0, **JA3BB**, **KM6AN** (15) 21-0, **VP8s** AQ (80) 0-2 and **BD** (40) 2-13; heard **CPs** 3CA (29), **5EK** (88), **HK1TH** (39), **HZ1AB** (88), **IS1CXF**, **LZ1KPZ** (88), **MB9BJ** (90), **OD5s** AX LC (30), **ZB1KQ** and **4X4BN** (54) as **W5VIR/2**. . . . . **CRs** 6CZ (38) 21, **7AN** (17) 20, an **EAG**, **F9YP/FC** (60) 19 and **ZD6BX** (50) 19 answered **W1WAI**. . . . . Climbing to 108, **W1OJR** settled on many of the aforementioned as well as **CR6CW** (18) 21, **EABBK** (15) 17, **EL5B** (37) 20, **ET2PA** (55) 18, **FA9VE** (65) 18, **11BLF/Trieste** (55) 17, **SP8KAF** (25) 16, **VQ4BNU** (18) 19, **YOSCF** (52) 13, **ZC4RX** (30) 17, **ZS3s** B (50) 21, **K** (32) 18, **3V8AN** (45) 13 and **5A4TX** (7) 17. Vic notes that former neighbor and ardent DX man **W1RY** now signs **W8RQ** as a Michigander. . . . . Log-snooping hither and yon, at **W1PWK**: **FG7**, **FM7s**, **VP7NX**, **W2GVZ**: **FB8**, Jan Mayen, **MP4QAJ** (58), a **ZD7**, **W2OLU**: **FY7**, **VE8s**, **VP6RG**, **ZB1**, **W2QBB**: **EAs**, **HC1LE** (60) 22, **W2ZGB**: **ET3**, **KJ6AZ** (110) 22-23, **KW6**, **ZD4**, **W3AXT**: **F9QV/FC**, **VQ6LQ**, **ZE5JA**, **W4EPA**: **ET3LF** (20-50) 17-20, **ZD4**, **ZS3E** (95) 21, **W6OWD/1**: **HB9QQ/MM** (25) 19, **KV4AA** (90) 12, **W6LRU**: **VR3A** (35) 17, **K6AAW**: **FQ8AB** (20) 2, **JAs** 1 through 8, **VP4LZ** (10) 23-0, **W7EWR**: oodles of **KAs**, **CX2AM** 3, **PJ2AJ**, **W3DLZ**: **CR6AR** (12), **TF5**, **ZD4**, **W0VFM**: **SP9**, **TF3**, **YV5FV** (88) 22, **F7ER**: heard **AP2Q** (18) 12, **VQ6U**: **VP1AA** (1) 23, **ZC4JA** 13. . . . . **WGDXC** 20-meter A1 goodies: **CE7AA** (52) 3, **CR6Cs** 60 (18, **EAs** 8AX (42) 14, **0AC** (10) 21-23, **FE8AE**, **FF8AP** (62) 21-22, **FL8AI**, **FM7WQ** (35) 0, **FQ8AM** (70) 3-4, **GC2FZC** (50) 19, **HB1MX/HE** (63) 14, **K6GGX** (83) 2, **KTIWX** (80) 18-19, **LUs** 1ZG (15) 2, **6ZT** (35) 22, **MIL** (58) 16, **MP4BBB** (79) 14-15, **OD5AI** (62) 15, **OQ5BQ** (49) 22, **SP3AN** (80) 14, **VPs** 3VN (90) 19, **8AX** (72) 0-1, **VQs** 2AB (21,

**FP8AK/VP2**, operated by **W2BBK** on Tortola, Leewards, B. W. I., from February 2nd through 4th, helped prime the gang for the appearance of **T19MHB**, Cocos, a week later. Doc and the **XYL** visited at the domicile of **VP2VA** (shown here with **W2BBK**) where the **FP8AK/VP2** Viking, S-72 and 80-meter half-wave ticked off about 150 QSOs on 80 and 40, plus a half dozen or so on 20 and 75 'phone. **W2BBK** looks forward to **DX**peditionary work from other spots and welcomes inquiries from **DXers** interested in accompanying him. Game?





The 1955 U. S. Antarctic Expedition buttoned up aboard U.S.S. *Atka* and left New Zealand for southern adventure in early January with W2ZK as the only ham included. Just before sailing, this photo was snapped of (l. to r.) W2ZK, ZL2JF, ZL2ASL, chief radiop Dehetre of *Atka* radio NMBT, ZL2ASL's jr. op, and ex-ZL2GO, father of ZL2ASL. It will be W2ZK's third Antarctic ordeal, for Bud is a veteran of the 1934-1935 and 1946-1947 Byrd explorations. He well knows what it's like to spend "three days and nights on the roof of an auto tractor in pitch darkness at 70 degrees below." We'll take a mild spring in good old U. S. A.!



2DA (0) 20, 2GW (5) 0, 4AQ (5) 20, 4RF (82) 18-19, ZDs 2DCP (42) 20-21, 3BFC (1) 23-0, ZP4ZQ (59) 22, ZS3s AB (30) 20, HX (52) 22, P (67) 19, 4X4DK (141) 15, 5As 2TZ (90) 0, 3TT (13) 13 and 4ET (40) 14. . . . . SCDXC volunteers CN2AD (60) 14, EA8AB (12) 17, FW8AB (80) 3, ISSV (45) 15, LX1AP (15) 16, MP4QAH (60) 15-16, OY2XX (22), VQ8CB 15, VS2CR (42) 14-15, YI2AM (60) 15-16 and 4SY7L (42) 7 who is rumored to have several beautiful daughters. . . . . G2RO at the keys of VL8RO (Nauru) and VQ8AY raised numerous eyebrows; so did VR2AB/A in the Tokelaus.

Forty c.w. keeps ridin' high. K6ENX (see Whence) went to town with CR9s AF (40) 15-16, AI (20) 16, DU1DR (30) 16, JZ0DN (28) 15-16 of Biak, KC6CG (25) 16, LUs 2ZI (30) 7, 7ZO (40) 7, OX3AY (20) 14, VPs 7NG (15) 2, 7NX (10) 1, 8AZ (30) 4, 8BE (25) 7, 8BH (25) 2, VSs 1FE (30) 15, 2CR (15) 16, 2EL (45) 17, 6CG (40) 14-15, 6CT (30) 17, 6DD (35) 16, YSIO (30) 3, YU3BC (20) 16, YV5DE (50) 11, ZSs 7D (20) 15, 7J (20) 15, plus cuties AI1BC (10) and KD6AT (25) 15, (AI1 is the MARS-AF prefix for Japan — what goes?) AC4NC and VK9DB escaped. . . . . EA6AF 23, HH3DL 22 with ex-VP7SL at the key, KG6FAA 13, PJ2AN (23), VPs 1AA 13, 7NM 23, OT G6UT at the key of ZS1RG 3 and 4X4FW 2 greeted W4YZC. . . . . W1WAI captured EA9s AP (9) 23, DF (21) 22, FG7XB (39) 2-3, FM7WP (17) 23, HR1JZ (20) and others. . . . . YV5DE 6, ZC6AEH 17-18, ZD6BX 19 and 4X4DE 21 gave in to DL4ZC. . . . . K6EC clashed with CE3DZ (11), CN8GB (12), a CR9, VP8s AY (37), BD (22), several VSs and ZSs. Ev's neighbor, W6KJR, contacted KC6AI (30) and KR6KS (22). . . . . CR6AI (8) 22, F9YP/FC (18) 22, GC3KAY (20) 0, HA5BT (19) 23, LZ1KAA (23) 1, SP6WF (7) 22, ZE3JP (31) 2, ZS3HX (10) 5 and 3V8HL (24) 22 were annexed by W4YHD. Jim heard UA2KAW, UB5KKA and U6KAF (34) 21 but they weren't having any. . . . . HK6AI (18) 1-2, HR1MC, LUs 4ZI 72M, TG9AZ, VR2CG (45) 18 and a ZS3 succumbed to W3AXT. . . . . FFSAK/VP2 was No. 188 for FASRJ, thanks to the good offices of W2HSZ. The latter also worked CR7CI (3) 4-5, CT2BO (30) 4-5, EA9AP, EL2X, FAs 30A9VN, GC3KGB, HC1LE, OQ5GU and myriad YUs. . . . . DU7SV, FP8AP, JAs 1AS 1CB 1KM 2LC SAE 0CG, W5GAN/KG6 and VP1AA (1) 3 QSOd W5CAY. . . . . Items at random, W4TFB: VQ4RF (15) 5, W3VIR: JA1AFF 14, KR6OY 14, TI2s BX 2, PZ 4, VP7NX, K6DVB: a DU, JA1s AA CR EU, KG6GX, W7VWS: JA3FG, with his new Viking Adventurer. VQ6U: IIBNU/Trieste 2-3, ZD6BX: JA1VE, VQ2DA, a VS2. . . . . Club 7-Mc. luck, WGDXC: FK58AZ (7) 1, FM7WD (20) 5, F08AK (80) 7, HC4MG (34) 13, HK4BF (22) 5, OQ5CP (15) 2-4, ST2AR (3) 22, UB5KAB (15) 3, ZD2DCP (5) 23, ZE3JL (30) 20 and 9S4AX (7) 21. SCDXC: CRs 4AL (1) 2-3, 5AQ (10) 1, 7AL (10) 15-16, HA5HR (12) 15, HB1LF (12) 7, KJ6FAA, LU0ZB, OUY7ML (13) 16, SP9s KAD (2) 15-16, KXS (12) 15 and SU1BR (20) 0-1.

Forty 'phone is murder but still there are hardy souls undaunted. Radio Moscow continues to simultaneously and steadily erupt on 7230, 7240, 7270 and 7290 kc. in the W/K A3 spectrum, with several other frequencies used in would-be 'phone-DX ranges below 7200 kc. NNRC reports CE3PV 10, CN8MS, CP3RC, DU9VL, EA8BC, EL2N 8, HH2s GL (167) 12, RM (165) 12, JA5 IUE 1VP 2AL 2AS 2BX 2FA 2FR 4EQ 6IZ, KJ6FAA (230) 5, TG9s, VPs in number, VK/ZLs and YN4CB as among those banging away in the A3 Test section.

Eighty c.w., however, is right in the groove. KP4KD agrees, what with CN8s BJ (25) 22, M1 (25) 22, CT2BO (10) 22-23, EL2X (5) 23, FAs 8BG (5) 7-8, 9RW (8) 7, KL7AWB (10) 7, LZ1KDP (5) 23-0, SP2BO (5) 20, YO3AR (20) 5-6, YUs 1AD (3) 23, 3IG (20) 5 and ZC4JA (15) 3. . . . . FA3TL, FY7YC, HA5KBA, HB1MX, HE, LU1ZS, OE2JG, PJ2AA, SP5FM, TI2BX, VP8BD, YUs 2BNO 3ABC 3HB 4GR, ZB1BF and ZD2DCP didn't elude W3AXT. . . . . Among W4TFB's lengthy list we spot FASDA (8) 6, KM6AX (3) 7, ZLs 1AO 1BY 1CI 3GQ 3QX 4IE and 9S4AX (5) 6. The Zedders peaked from 7 to 8 on the Greenwich clock, all near the low edge. . . . . GD3CB, YO6AL (6) 4, YU2BOP (a jazz man?) and ZB1BF (12) 4 clicked with K2BZT. . . . . More 3.5-Mc. luck here and there, at W1WAI: VP9BL, a 984, W2VVS: KM6, LU2, ZK1BG (12) 1; heard DU7SV (21) 5, UB5CF (11) 1, W4YOK: EL2, FA9, VP7NX, YV5BJ, Y4YZC: CT2, VP7, K6AAW: KL7, KM6, VQ6U: FASDA, YV5BG. . . . . SCDXC and WGDXC sources add 80-meter candidates HB1AQ HE (30) 7, JA1CR (6) 12, LZ1KAA (7) 1, SP3AK (12) 8, SU1SW (8) 15, VPs 7NM (10) 8, 8BH (8) 1, XE1OE (20) 8 and YU4AA (2) 7. Don't snicker at that XE entry — have you got a Mexico QSL on 3.5 Mc.?

Fifteen 'phone crawled out of wintry doldrums to give W9HYG a pile of ZSs, CN8CS (25) 19, CR6BH (230) 17, CX5AF (241) 22, HC1FK (224) 18, OA5G (251) 16, TI7ES (265) 19, OQ5RU (160) 19, VPs 6TR (250) 17, 5AE (214) 13, ZE2KR (130) 14 and ZL1BY (226) 15. . . . . W5VIR cornered CP5EK 22, CX1GG 17, EL2X 17, HC1s LW 22, PL 19, HP3FL 22, HR1EM 18, OA4s C 1, CC 23, PJ2s AA 21, AO 16, TI2s ACM 22, BX 23, GC 21, VPs 1GG 22, 5DX 18, 5SC 15, 8AQ 23, YN1AA 23 and YV4BV 22. . . . . DU7SV, KA9MF, KR6AF, KW6BB, OQ5GM, ZS3s AB and BC returned the compliments of W7AIX. . . . . W6NJU's new 21-Mc. rotary impaled CE3II, KG4AC, YV5EC, VKs 2AMD 4TN, ZLs 1OF 2BN 2IJ 2RC 4GC and 4HE. . . . . Observing opprobrious treatment of the U. S. 21-Mc. A3 band limits on the parts of many Test participants, W6ZZ racked up CE, DU, EL, KA2KC, KG6GX, many KH6s, KJ6AB, KL7s AOL BFP, KV4BD, LU1EQ, VP1 and VP5, VP7NX, VR2CG, ZL2LV, ZS6s ABK CV DW and ZO. . . . . 21-Mc. 'phones CN8s HVM, EA8BQ, OK1KAI, OQ5EL, ZDs 3BFC 6BX 9AC (225) 16-17 and ZC4JA are specified by NNRC, SCDXC and WGDXC organs. . . . . The latter organization denotes c.w. performance by 15-meter men FASRJ (30) 18, I1BLF/Trieste (67) 17, ZE3JL (40) 18 and ZS3K (35) 17. . . . . More code stuff from W3VIR: DU7SV (110) 23-1, FASDA 17, KA2KS 22, KG4AN 22, OQ5s GU 16, RU 20, VPs 5SC 14, 7NM 14, VQ2HR (80) 20 and YV5BX 16. . . . . FY7YC (5) and VP8BD (215) were 21-Mc. radiotelegraphers checked off by W8DLZ.

Ten 'phone appears on the verge of something or other but we had better not hold our breaths. Anyway, ZLs, other Oceanians and Africans are sneaking signals into North America at odd intervals. The NNRC boys found north-south paths open for CE2HJ, HC1KV, TI2BX (480), 3LA (480) 17, VP1AP (260) 17 and CE11Q.

One-sixty c.w. produced a good many multipliers for February and March ARRL Test contestants. Regular participants in Transatlantic Test doings found the going slow but gratifying. This assortment of DX is reported available: EI9J, G2s AJ HKU, G3s BKF BLA ERN ETP





DU6RG competes with DU6IV for honors as the most active DXer among Iloilo City's half dozen amateurs. (Photo via DUTSI)

FMZ GGN GM HDB IIQK HRW IZK JBM/A JEA JED JJZ JAIL JMS JNO JOJ JVI JVK PU, G4NS, G5s JU LQ PU RI, G6s GM HD LB, G8s PG PU QZ WF, GC3HFE, G1s 3HCG 3IOS 5UR, GMS 2BUD 3EIH 3IHP 3HRZ, HB9CM, HK4DP, HRI1W, KP4s CC DV KD, KV4AA, LU3EL, OA5G, OD5LX, OKs 1AEH 1AJB 1IHI 1KTI 2KHS 3AS 3DG 3MR, TA3AA, TI2s BX WR, VP8 4LZ 7NG 7NM, VS6s CQ CZ, YU1GM, YV5DE, ZC4s FB GF JA RX XA, ZLs 1BY 3AB and 3RB. DL1FF had no I.R. Me. rig authorization and could only listen, doing fast and furious logging. SWLs J. L. Hall, R. and W. Iball did fine reporting as did groups sparked by Ws 1BB and 3RGQ. . . . . One-sixty good fortune at this shack and that shack, at W1WY: EI Gs KP4 KV4 VP7 YV5. W1ZL: G KV4 TI VP7 YV5. W2QHH: EI KP4 OK1 TI VP7. W3E1S: G HB9 KV4 OK1 TI VP7 YV5. W3RGQ: OK1 and others. W4KFC: ZL1, others. W9FIM: KP4 VP7 YV5. W9PAE: G KV4 TI VP7 YV5, 2 ZLs. KP4KD: G LU3 TI YV5 and EL2X cross-band to 80 meters. . . . . Seasonal atmospheres reach North America beginning this month and 160-meter activity will drop. But bear in mind that cold quiet nights are developing south of the equator — the LU and ZL season really extends into the U. S. A. summer.

## Where:

W1RDV, who keeps his eye on IARU QSL bureau developments, advises that Dominica Islanders can receive all QSLs via VP2DA. Also, that VQ5-bound cards can be addressed to P.O. Box 1803, Kampala, Uganda. . . . . W0PRM now undertakes U. S. and Canada QSL chores for 9S4AX, spelling W1NWO in a task well done. Full QSO data plus stamped self-addressed envelopes are required. . . . . W8ROV (ex-XU8ROV), who distributed rare Lanchow, China, QSOs during November of 1945, welcomes QSL inquiries at the address to follow. . . . . G2MI of RSGB emphasizes that new postal regulations call for higher postages on overseas mail. To avoid return or delay of your packs of RSGB-bound QSL cards make certain that sufficient postage is attached. . . . . ZS6FN acts as QSL manager for Marion Islander ZS2MI at P.O. Box 7243, Johannesburg. "Contacts will be confirmed on a QSL-for-QSL basis and return postage [IRCs] should be included if direct return QSL is desired. I receive ZS2MI's log over the air weekly." . . . . . New IRTS (Eire) QSL bureau address: I. Morris, EI6U, 9 Shanrath Rd., Whitehall, Co. Dublin. . . . . XE1BI of LMRE debunks XG6A operation, adding that XE1 XE2 and XE3 are Mexico's only regular call-area prefixes. XE5 XE6 and XE0 represent special permits. No XG-prefixed ham calls have been assigned. . . . . More debunking — SV0WO thumbs down SV1AZ "on Crete." Greek nationals SV1s AB and SP have the only such. Incidentally, over a dozen SV0 calls are active in Greece and all can be QSLd via Hq. JUSMAGG, APO 206, New York, N. Y. "It is possible that American civilians will be allowed to operate here sometime this year. If so, Rhodes, Salonika and Crete should be well represented." SV0WO lists SV0s AS KS

WX and WY as n.g. . . . . W6UED has it that LU9AH handles only *outbound* Argentine Antarctic QSLs. Incoming confirmations for LU "Z" stations should go via the Argentine society (RCA). . . . . Ex-VP8AZ (G3IJZ) stresses that all VP8s can be QSLd via RSGB or % Postmaster, Port Stanley, Falkland Islands. The VP8 mail proposition continues a tough one. . . . . For the alphabetical digest to follow, many thanks to W1s MX OJR RB UED, W2s CR GT TXB, K2ENO, W3s AXT SOH, W4s CBQ EPA KFC YHD YOK YZC, W6s AM DZZ OWD/I TI UED, K6EC, W8DLZ, W9s CFT EU GVZ, W0VFM, NCDXC, NNRC, SCDXC and WGDXC:

CE7ZU (QSL via CE3OQ) . . . . . CO7PG, Box 58, Camaguey, Cuba . . . . . CR6CW, Box 1400, Luanda, Angola . . . . . EA9DE (QSL via EA2CA) . . . . . ET3MB, Box 114, Addis Ababa, Ethiopia . . . . . ET3TRC, P.O. Box 1047, Addis Ababa, Ethiopia . . . . . F7DO, E. J. Doyle, 16 Rue Levy, Alphonbery, Chaumont, Haute-Marne, France . . . . . F7ER (QSL via F7DZ) . . . . . F9YP/FC, Claude Garcia, Calvi, Corsica . . . . . FA3LY, R. Forin, 25 Marecau, Oran, Algeria . . . . . FB8BM,



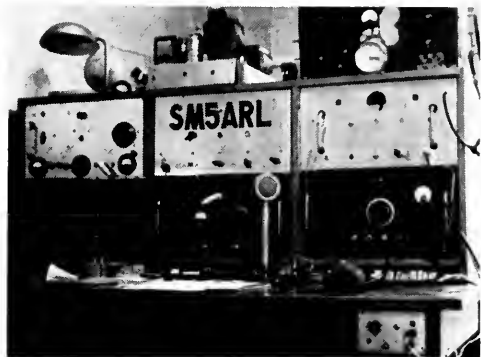
At inspection ready, the DXpeditionary kit of K6EUV. Revamped BC-458, BC-454, and indispensable accessories squeeze into the solidly built case at upper left. This layout was scheduled for action on Gibraltar as ZBZN but, "The best-laid schemes o' mice and men aft gang a-gley." See Whence.

Box 806, Tananarive, Madagascar . . . . . FD8AA, Box 185, Lome, French Togoland . . . . . ex-FF8AZ, Sgt. H. Josse, Chateau de Pas, Centre d'Essais en Vol, Bretigny-sur-Orge, Seine-et-Oise, France . . . . . FPSAK/VP2 (QSL via W2BBQ) . . . . . HA5KBA (QSL via W3AXT) . . . . . HC1ER, M/Sgt. E. Rodriguez, USAF Mission, % U. S. Embassy, Quito, Ecuador . . . . . HK4BQ, Box 728, Medellin, Colombia . . . . . HR2HA, H. Auler, San Pedro de Sul, Honduras, C.A. . . . . KG4AV, A. Babine, Box 55, Navy 115, FPO, New York, N. Y. . . . . ex-KR6LE (QSL to OA5G) . . . . . KS4AW, J. Itaneock, Swan Island via Tampa, Fla. . . . . LB1LF (QSL via NRRL) . . . . . LU1ZT, P. A. Zotelo, Destacamento Naval, Bahia Luna, Islas Shetland del Sur, Antártica Argentina . . . . . M1L (QSL via M1B) . . . . . MP4BAM, Umm Said, QPC Ltd., Qatar, Persian Gulf . . . . . OA5G, G. L. Starkey, Apartado 1229, Lima, Peru . . . . . OQ5CP, Box 392, Elisabethville, Belgian Congo . . . . . OX3PW, 1B Pfaff-Weiss, Frederiksdal Loranstation, Greenland . . . . . ex-OY2B, R. Bugatsch, Gormsgade 25 blomsterforr., Copenhagen, Denmark . . . . . SM8BWO (QSL via SSA) . . . . . ST2GB, RAF, Khartoum, Sudan . . . . . SV0WO, Lt. Col. L. Kruse, JUSMAGG, APO 206, New York, N. Y. . . . . TI9MHB (QSL via NCDXC, P.O. Box 75, Oakland, Calif., or via ARRL) . . . . . VE8QL (QSL via VE3BQL) . . . . . ex-VK0WZ, 4 Liston St., Parkside, S.A., Australia . . . . . VP8AY, 7 Drury St., Port Stanley, Falkland Islands . . . . . ex-VP8AZ, M. J. Faulkner, G3IZJ, 13 Lovatt St., Newport Pagnell, Bucks, England . . . . . VP8BD, B. Taylor, FIDS Base A, via Port Stanley, Falkland Islands . . . . . ex-VP8BE, B. Weeks, 55 Robins Lane, Frome, Somerset, England . . . . . VP9BZ, T. Wingo, RMC, Navy

138, FPO, New York, N. Y. .... VS2BD, E. B. Powell, P.O. Box 600, Penang, Malaysia .... VS2EG, Box 57, Ipoh, Malaya .... VS2EL, 68B Jalan Kuantan, Kuala Lumpur, Malaya .... XE5PA, M. S. Boer, 1116 Palm Terrace, Pasadena 6, Calif. .... ex-XU8MI (QSL to K6ENX) .... ex-XU8ROV (QSL to W8ROV) .... ZB1JRK, J. R. Killeen, Sgts. Mess, RAF, Luqa, Malta .... ex-ZC4JA-VU2CA (QSL to G3CAA) .... ex-ZC4FB, E. H. Ross, War Office Wireless Stn., Beaumanor Pk., Loughborough, Leics., England .... ZD4BM, B. A. Wilbraham, P.O. Box 260, Takoradi, Gold Coast .... ZS2MI (QSL via ZS6FN) .... ZS3DX, H. A. Beukes, Posbus 348, Keetmanshoop, S.W. Africa .... ZS7L, J. Perry, Mbabane, Swaziland, U. of S. A. .... 9S4AX (QSL via W0PRM).

## Whence:

**Asia**—From HZ1AB (W6CRV): "Latest estimate of the number of QSOs by this station in the past two years is about 50,000, most of these between June of '53 and June of '54 when the station was on about 20 hours a day. About QSLs—we have ordered new ones which should be here any day. When they get here, QSL bureaus can expect batches as soon as we get them made out." HZ1AB's current schedule allows for 14-Mc. work from 1030 to 2200, 7 Mc. around 2100-0200, 3.5 Mc. (infrequently) at 0200, and 21 Mc. at about 1600, all times GMT. Ron had a pair of 750TLs and a rhombic schemed up for the DX Test .... MP4QAH confirms to W6AM that there is no legit MP4ABW. OM Mould has been scrounging around to replace gear lost in a recent shack fire. Jeeves trusts we didn't jinx Tony with those MP4QAH photos in Dec., 1954, QST. MP4QAH now owns a VS9 label for Trucial Oman operation .... W9EU notes that MP4BAM previously signed G8JX and VS1GF .... G3FQX



This clean-cut compartmental design at SM5ARL makes for facile experimentation as well as convenient operation. Frequently on duty at the SSA QSL bureau, Gunnar is DXCC with 127 ARRL Countries List items checked off postwar.

heads for Cyprus and a ZC4 label but W4SWN, stationed at Famagusta for some time now, is ineligible for a ZC4 call .... OVARA's *Ether Waves*, W4KVX editing DX, has info that G3IDC (ex-MP4BAB-VS9GT) is packing a 25-watter along on a G2RO-like DXcursion to include stops in ZC4 VS9 4S7 VS2 VS6 VS1 ZL VK and AP2 in that order. Rarer side-stops are contemplated and the jaunt should wind up around the end of this month. Frequencies to watch are 7025, 14,025, 14,090 and 21,025 kc. .... ex-XU8ROV now stalks 7-Mc. DX as W8ROV .... Club Asiatic tidbits, WGDXC: MP4BBL, who likes 14,079 kc. between 1400 and 1500 GMT, is dreaming up a beam to help him cut the 20-meter mustard. SCDXC: Ex-4S7XG's 1600 Ceylon QSOs now have been QSL'd. JASBC is one of the few JAs authorized to work the 80-meter band.

**Africa**—Additional Ethiopian info from W4KFC: ET3S has signed VE calls 3AWQ 4NS and SNY. With ET3 activity now in high gear the boys will put club station ET3TRC on several bands before long. ET3S looks for 14-Mc. A3 and A1 customers from 1700 to 2100 GMT, needing a dozen states to finish WAS. For the information

of those who prefer their ET3 QSLs direct, Ethiopia-U. S. airmail costs an equivalent 32 cents. .... W1PWK, who answered all SWL cards while operating CN8EG, tells of an instance where this policy really paid off. His first VU2 QSO and QSL came from a grateful ex-SWL to whom he had previously sent a fast reception verification .... W4EPA learned that ET3LF, who has spent the past eight years in Ethiopia, worked 65 ARRL DXCC List countries in his first 40 days on the air .... ZD6BX still seeks North American 3600-ke. QSOs around 0500 GMT. Vic exhausted his QSL supply and must rely on homebrew cards until new stock arrives. ZD6BX passed the 130-country mark with his 1955 goal set at 200 .... Club African reports, SCDXC: Fifty roaming U. S. electronics may produce some future ZD7 hamming. ZD3BFC has been scheduling G3CC on 14,104 kc. around 1700 GMT. WGDXC: ST2NW is off to VS5 climes. Lack of portable gear is all that keeps ZS5NZ from trying ZS7 ZS8 and ZS9 DXpeditioning.

**Oceania**—Writing from New Zealand just before he departed for Antarctica with this year's Byrd Expedition, W2ZK states that it is extremely doubtful that ham activities will be carried on from the frozen bases. MARS call sign A2ZK/MM was assigned to Bud for use aboard *USS Atka*. The 1955 bases will be set up in the Bay of Wales area where KC4USA operated amateur bands in 1939 and 1940 .... W2AIS, of ZC8 and KH6 renown, dropped into Hawaii for a fast visit .... W9PUH, whose favorite amateur band is 1215 Mc., writes from the Philippines that chances of U. S.-personnel licensing there appear as dim as ever. The closest approach is MARS operation at Clark AFB .... Via VK6MK, W3JNN and W1WPO we learn that ex-VK1JC's Heard Island log inadvertently was destroyed by fire. A bad break—no more VK1JC QSLs can be forthcoming .... With an assist from W6MUR, further research at the Hq. DXCC desk establishes that the islands of Fakaofo, Nukunono and Atafu should be included in the Tokelau but that Manihiki, Rakahanga, Penrhyn (Tongareva) and Pukapuka (Danger) are to be counted as among the Cook group .... Club Oceania items, WGDXC: VK9WZ closed down in favor of possible VK5WZ work. KP6AK works KH6OR and KH6SL around 0200 GMT on 14,128 or 14,245 kc. JZ0DN of Biak likes 7-Mc. hamming around 0300 GMT. VK9YT reached Ohio on his Stateside travel itinerary. SCDXC: The VK/ZL gang reports that nonamateur ham-band interference continues grim Down Under. VR6AC struggles to get out with QRP on 14,320 kc. while awaiting higher power; fellow VR6s AW and AY operate Pitcairn Radio ZBP on 8 and 12 Mc. but do no hamming.

**Europe**—U. S. military personnel currently licensed for operation in Greece include SV0WS A I J K L M N O P Q R S and T. SV0WJ is the call of the Air Attache Radio Club in Athens .... Many authorities (and we use the term flaccidly) have arisen as concerns purported Albanian hamming. One thing is certain: A ZA call sign ranks high on the list of phoney prefixes favored by Continental bootleg artists. Anyway, SP3AN told ZC4FB of his aspirations toward a ZA DXpedition this year (how

(Continued on page 134)



Meet the Famagusta Gang, half the ham population of Cyprus. Front, l. to r., ZC4s CF JJ CA and MW; rear, ZC4PB, an SWL, ZC4s LW FB and CK. These boys have fought QRM on all DX bands from 160 through 10 meters. ZC4s CA and FB are closing stations for return to the United Kingdom.



# Operating News



**F. E. HANDY, WIBDI, Communications Mgr.**  
**R. L. WHITE, WIWPO, Asst. Comm. Mgr., C.W.**  
**PHIL SIMMONS, WIZDP, Communications Asst.**

**GEORGE HART, WINJM, Natl. Emerg. Coördinator**  
**ELLEN WHITE, WIYYM, Asst. Comm. Mgr., Phone**  
**LILLIAN M. SALTER, WIZJE, Administrative Aide**

The survey of Region I (FCDA) facilities is in progress and the Civil Defense Radio Test mentioned in December *QST* is to take place on April 30th. Tentative plans for traffic (making fullest use of RACES frequencies) are to be completed at a March meeting of ROs and SECs of New York, New Jersey and New England. All amateurs in these states are urged to find out from their EC, RO, SEC or SCM if necessary: (1) Any radio test details too late for this issue of *QST*. (2) How they can take part or assist. (3) How to get registered with the AREC or signed up to help under any applicable RACES plans.

**RACES Progress.** It has been some time since we reported the number of approved RACES plans. FCC's latest Annual Report indicated 89 such plans approved during the fiscal year that ended last June 30th, also 754 RACES stations had been authorized. As of the end of 1954 we are informed by the Federal Civil Defense Administration that 165 RACES plans now have been approved, another 76 in just the last six months. Besides this we're advised that 55 more are under study. The latest figure on amateur station RACES authorizations (December 31, 1954) indicates 1254 RACES station authorizations then had been issued. A full fledged nationwide test of stand-by radio communications dedicated to civil defense purposes is planned to accompany the coming June 14th-15th general c.d. alert. Amateurs not identified in RACES or AREC should make local inquiry of Radio Officers and ARRL ECs to register facilities and ask where they may serve in connection with this and future calls for civil defense emergency or natural disaster radio circuits.

**Directory of School Amateur Radio Clubs.** A new 1955 directory lists detailed information on 109 high school clubs with active stations, 26 additional stations identified with schools and college stations identified with the prep school net and a college amateur net. This must be an-

nounced as *available to other schools* that in asking for the directory, will furnish data for a listing of their own. Give your school club name, its station call, address, officers' names, bands operated, whether schedule is desired, days and hours desired, frequency used, number of club members, number of licensed operators, and dues. This High School Club Directory is not available from ARRL, but from Department of Health, Education, and Welfare, Mr. Willis C. Brown, W3HB, Specialist for Aviation Education, Office of Education, Washington 25, D. C.

**Taking Stock.** There are a good many ways to review progress as an individual amateur operator. Post mortems after Field Day or other activities enable us to improve procedure and know-how and to plan which bands to work next time. In "taking stock" we feel each amateur should consider whether he has or can take a part in a local AREC-RACES program, holds ARRL appointments to constructive ends, reports in his Section Net, etc. Only thus does the individual derive the benefits reflected from an *organized* amateur radio which carries more than casual implications.

The Detroit Amateur Radio Association stressed this principle of review-and-action in its QMN Bulletin recently. President Moline, W8GB, delineated five points to be checked by club member amateurs looking to individual and group progress in Amateur Radio. Resolutions suggested by the DARA treatment:

- (1) To come to club meetings often, with a purpose to make the club a better one and meetings interesting and enjoyable.
- (2) To check safety features of one's rig, from a.c. outlet to antenna, providing against hidden hazards.
- (3) To help newcomers to our hobby, particularly those younger and less experienced.
- (4) To complete shielding on TVI treatment of every transmitter, so all can operate without bothering decent versions of the one-eyed monster.
- (5) To ask one's self, "what am I doing in amateur radio that has public service to country, state or community or our *organized* amateur radio."



Early in February, we got together with some Civil Defense "brass" to discuss RACES matters in general and the forthcoming FCDA Region I RACES test in particular. During the noon hour, WIBDI lined us up in front of "ole 38" and took this snapshot. From left to right are the following: John Huntoon, W1HVO, ARRL Assistant Secretary; Vincent T. Kenney, W2BGO, N. Y. State C.D. Radio Officer and chairman of the Northeastern States Civil Defense Amateur Radio Alliance; Charles E. Dewey, W8LBM, from National FCDA Headquarters in Battle Creek, Mich.; George Hart, WINJM, ARRL NEC; James E. Fair, FCDA Region I Communications Officer.

**QST for**

**Check Rigs and WWV To Avoid Off-Frequency Citations.** W2FE (OO) reported early this year that "A lot of W and K stations are observed working phone beyond the 14.2-14.3 Mc. limits. Stations in the 14.1-14.2 sector were heard calling CQ 15, so apparently some of their multiplier stages are radiating from a poorly-shielded amplifier." According to OO reports the calibrations of 15-meter phone band edges are not appropriately checked back against WWV by some of the operators with VFOs.

Stations newly on the air (especially Novices) may well request some amateurs they work to listen for *their exact harmonic* to see if the harmonics, especially the third, are being heard at any distance. A grid-dip or absorption frequency meter can show up such defects in your equipment too. We mention this since OOs still report hearing WN harmonics quite plentiful.

### A.R.R.L. ACTIVITIES CALENDAR

Apr. 1st: CP Qualifying Run — W6OWP  
Apr. 13th: CP Qualifying Run — W1AW  
Apr. 16th-17th: CD QSO Party (c.w.)  
Apr. 23rd-24th: CD QSO Party (phone)  
May 7th: CP Qualifying Run — W6OWP  
May 12th: CP Qualifying Run — W1AW  
June 3rd: CP Qualifying Run — W6OWP  
June 11th-12th: V.H.F. QSO Party  
June 17th: CP Qualifying Run — W1AW  
June 25th-26th: ARRL Field Day  
July 2nd: CP Qualifying Run — W6OWP  
July 11th: CP Qualifying Run — W1AW  
July 16th-17th: CD QSO Party (c.w.)  
July 23rd-24th: CD QSO Party (phone)  
Aug. 5th: CP Qualifying Run — W6OWP  
Aug. 16th: CP Qualifying Run — W1AW

We also learn indirectly that one Novice was allegedly taken in by a mail approach (for cash money) *resembling* an off frequency citation from one of the FCC monitoring stations. Asking for money with citations is something *not* in the FCC pattern of such notices. See pars. 12.153-4-5 of our regulations for what to do about citations; also note that FCC penalties following an unsuccessful history of regulation observance generally take the form of a direct "suspension of license" where required, not a fine! Cash penalties are provided in Sections 501 and 502 of the Communications Act upon conviction by the Justice Department of willful violations. Regarding harmonics, ARRL Official Observers are doing all they can to help fellow amateurs keep out of trouble. In addition, amateurs actively operating are requested to especially watch the harmonic shadows of our bands, especially those falling in non-amateur territory so they can check themselves and others. By notification to a brother amateur of a signal heard out of the bands, either by message or postal card, any amateurs having unduly strong harmonics may be assisted to avoid an FCC notice.

**Ready for Field Day?** For some months the activities calendar has carried the announcement of Field Day dates, June 25th-26th. That is not so many weeks away now. We therefore suggest

that all hands plan for early completion of any new gear to be tested in this year's Field Day. Year 'round use of emergency-portable and mobile gear is of course to be highly recommended. Devices in daily use are conditioned for surest stand-by dependability when the chips are down. A rig on the shelf has greater likelihood of requiring work to repair it as well as time to rewire it and get the hang of the controls.

So get your gear in use ahead of time and in any event plan to test it in intensive operation come FD! Don't miss getting in the fun *this year*. Log forms for report of ARRL Field Day stations will become available about the last week in May. A letter or radiogram will bring yours gratis. All affiliated clubs have already received complete copies of the Field Day rules which will be re-run in June QST. C u FD? — F. E. H.

### JANUARY CD QSO PARTIES

A far-western trio, composed of W6LDR, W7BSU and W7PCZ, showed other ARRL appointment holders a thing or two in the January c.w. CD Party, Los Angeles ORS W6LDR setting the pace with 316 QSOs in 63 sections. The 'phone party was another contest-type workout; easterners W4FV, W2AEE and W4TVO lead the voicesters.

The highest scores follow. Figures after each call indicate score, number of contacts and number of ARRL sections worked. Final and complete results will appear in the April CD Bulletin.

#### C.W.

W6LDR.....	180,747-316-63	W2ZVW.....	83,780-277-59
W7BSU.....	158,880-292-60	W1WPO.....	81,875-290-55
W7PCZ.....	155,736-309-56	K6ATZ/6.....	81,487-182-49
W1EOB.....	126,900-416-60	W8LHV.....	79,800-273-57
W4KFC.....	126,600-415-60	W3VOS.....	74,725-300-49
W1MAY.....	126,000-414-60	W1AW.....	73,700-261-55
W6YHM.....	121,440-242-55	W1JTD.....	73,425-260-55
W4PNK.....	108,300-380-57	VE7QC.....	73,008-156-52
W8NOH.....	102,175-330-61	W2IVU.....	72,850-307-47
W4YZC <sup>1</sup> .....	100,925-360-55	W3PWN.....	71,910-301-47
W1RAN.....	98,610-340-57	W6CRT.....	71,094-151-51
W4LA.....	94,620-325-57	W2FEB.....	70,200-270-52
W9KLD.....	93,240-330-56	W7VIU.....	66,915-163-45
W1WFF.....	92,310-356-51	W0VBQ.....	66,120-227-57
W4BZE.....	91,530-334-54	W6CHV.....	63,342-127-54
W0RDN.....	90,160-322-56	W4UOA.....	61,215-226-53
W2IVS.....	90,060-309-57	W0ICB.....	61,005-249-49
W1TYQ.....	89,305-337-63		

#### 'PHONE

W4FV.....	23,680-123-37	W8IFX.....	15,050- 86-35
W2AEE.....	23,560-124-38	W4BQG.....	14,400- 80-36
W4TVO.....	22,050-126-35	W8PBN.....	13,800- 92-30
W8NOH.....	18,975-110-33	W2ICE.....	11,560- 68-34
W1CRW.....	18,910-122-31	W9ZRP.....	11,550- 74-30
W3MWL <sup>2</sup> .....	18,400-112-32	W6CHV.....	11,100- 46-25
W2ZVW.....	18,200-107-32	W5HJL.....	11,055- 63-33
W9KDY.....	18,150-110-33	W3MFX.....	10,500- 65-30
W4YE.....	16,050-100-30	W4LK.....	10,260- 76-27
W8ZJM.....	15,810- 87-34		

<sup>1</sup> Multiple-operator station.

<sup>2</sup> W3ULI, opr.

— . . . —

Our next CD Parties are coming up this month. Any holder of an ARRL appointment or office will be eligible to take part. If you're interested in organized operating activities and do not already hold an appointment, see the list in the booklet *Operating an Amateur Radio Station* or the *Handbook* and decide which appointment suits your interest and qualifications. Then write your SCM or the ARRL Communications Department for complete information on how to qualify for the appointment of your choosing.

### W1AW OPERATING NOTE

Effective April 24, 1955, all W1AW operation as detailed on page 71, March QST, will change to *Eastern Daylight Saving Time*. This means that to copy code practice, bulletins, etc., you will have to listen one hour earlier by your clock if you are in areas which remain on standard time. Similarly, all general operation shown in the chart on page 70, September 1954 QST, will be conducted on EDST instead of EST until further notice. The complete W1AW summer schedule of operations will appear in the Operating News section of May QST.



# With the AREC

This year's winner of General Electric's Edison Award, as noted elsewhere in this issue of *QST*, is Ben Hamilton, W6VFT, SEC for our San Diego Section and RACES Radio Officer for San Diego County, Calif. We had the opportunity to visit Ben and inspect part of his installation last summer. The award was presented at the customary exercises in Washington on Feb. 10th.

Make no mistake about it, such recognition does not come easy. Ben was selected from a considerable number of candidates, after careful screening of the qualifications of each. While his selection was a signal honor to W6VFT, it is also an honor, by reflection, to all of us amateurs who have devoted our efforts toward civil defense work; and that means most of the AREC. In fact, the principal speaker at the presentation was Val Peterson, FCDA administrator, who paid high tribute to amateur radio, and indicated that in the event of an atomic attack it was quite possible that RACES might be the first and *only* means of communication in the immediate post-attack period.

Does that frighten you a little? It should. It should frighten all of us out of any complacency or lethargy we might be experiencing and get us going toward a bigger and better RACES through our own AREC. Because, just as the Edison Award to W6VFT for civil defense (RACES) work is a tribute by implication to all of us, the responsibility of being prepared to provide the *first and only* immediate post-attack communication is a serious and sobering one.

W9UQT reports on the work done by amateurs in the ice storm which centered about Clinton, Ill., on December 30th. The storm lasted about 24 hours, and work done was principally on behalf of the Illinois Central Railroad, who asked the amateurs to help. W9KRH/9 was set up at the ICCRR depot for the period of the emergency, manned by W9KRH, W9KXN, W9PEK and W9VHD. Some 40 railroad traffic items were handled by amateur radio that could not be handled any other way. As usual, the Illinois Emergency Net went into operation almost immediately on 3940 kc. There was full cooperation of all net members standing by, ready to help when possible. Doc mentions the work of W9KXN as especially noteworthy, and also commends W9WHH and W9OOL for their untiring efforts in relaying and keeping the frequency cleared. The following were also logged as having participated. *W's* AEZ AJK ATJ BCY BUH CNB CSW DJG DKA DNL ESB

## NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C. W.	'PHONE
3550 14,050	3875 14,225
7100 21,050	7250 21,400
28,100	29,640

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050 14,060; *'phone* — 3765, 14,160, 28,250 kc.

## NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

FEV FTB FVL GET IAD IBI JLL JRQ KAY KCW KCX KRH KXN LDU LFY LHS LWH LXD MNR OFI OKI OOL PEK PLY PNK PSQ PSP QLR RNM RUW TCE TCX TH TUC UQT UUS UWC UWG VGM VHD VQC VSX VT WIIH WXX YCS ZEN.

Members of the Huntsville (Ala.) Amateur Radio Club turned out on Feb. 1st when a tornado struck Normal, a small community north of Huntsville, and took the control stations for the Highway Patrol, city police and sheriff off the air. Promptly at the scene of principal damage, in the vicinity of Alabama Agricultural and Medical Institute, were W4s AQB BJJ/m BSN FOG HHU WOF/m YQE/m ZSB and KN4AIL. All but one of these are AREC members. First news of the damage was brought from the affected area to the city by amateur radio.

Amateurs in South Dakota joined forces with law-enforcement agencies in late January to help track down a bank robber. W000Z and other members of the Sioux Falls Amateur Radio Club spread the alarm along four states following the bank robbery at Harrisburg, S. Dak., requesting that all amateurs notify their local police and the small towns notify their garages and filling stations in the area. Although the robber hasn't been caught yet, amateurs received high praise from the sheriff of Minnehaha County for their efforts.

Another instance of amateurs assisting in highway accidents. On October 18th, W2GKP received an emergency call from W2BRP/m on 10 meters at the scene of an automobile accident on the West Side Highway in New York City. W2BRP requested an ambulance via W2GKP. The ambulance arrived on the scene within three minutes.

"During the afternoon of Feb. 6th there was a weather warning for possible tornadoes in the area covering most of middle Georgia. As EC of Houston County, Ga., I started a net on 3995 kc. to keep a frequency clear in case of an emergency — also to gather weather information. W0RV/4 alternated with me as net control." — *W5RDP/4, EC, Houston Co., Ga.*

On Feb. 5th, the police chief of Dartmouth, Mass., called for volunteers to assist in searching for a missing seven-year-old boy. Local amateurs turned out to assist, under direction of Assistant EC W1WGN. New Bedford mobiles W1s AGG AZY and ZPE also responded. W1CDO acted as relay station in New Bedford. From Fairhaven, mobiles W1s AWH ONK and ZHC responded, with W1APN for fixed relay. W1BMQ was also on hand with his mobile from Dartmouth. The amateur mobiles cooperated with Dartmouth Police, the Dartmouth Fire Department, the CAP and the Coast Guard in providing thorough communications coverage of the search area. The story has a sad ending — the boy's body was recovered from the bottom of Padanaram Harbor — but amateurs were on the job to do what they could, as usual. — *W1AVI, EC, New Bedford, Mass.*

Tennessee SEC W4RRV tells us that for some time he has wished to do something to encourage the Novice licensee to become actively interested in emergency work. Now he's done something about it. On Feb. 2d, the Tennessee Novice Emergency Net came into existence on 3737 kc. The net will have only Novices for members, except for the NCS, who will hold appointment as an EC and will be General Class or better. Within the AREC organization, the net will act as a unit under its EC, with the latter issuing AREC member cards. W4RRV figures on an almost complete turnover every six months as Novices get their General Class licenses and "graduate" to their local AREC units as full-participating members.

Fifteen SECs reported December activities of 4620 AREC members, to wind up our 1954 season. Two new sections, Missouri and Minnesota, put in their appearance in December reports, making it 31 sections heard from during 1954, a total of 178 SEC reports received during the year. This compares favorably with the figures for 1953 and 1952: in 1952, 204 reports were received from 29 sections, and in 1953 154 reports were received from 25 sections.

One-hundred-percenters: Western N. Y., N.Y.C.-L.I., E. Fla., Wisconsin, S. Dak. Eleven reports: Colo. Ten re-

ports: Los Angeles, W. Fla. *Nine reports:* E. Bay. *Eight:* W. Va., Tenn. *Seven:* Georgia. *Six:* N. Texas, Montana, San Joaquin Valley. *Five:* Nevada, New Mexico. *Four:* Alaska. *Three:* Ontario, Ariz., Vt. *Two:* Nebraska, Ore., Louisiana, Alabama. *One:* Saskatchewan, Idaho, Md.-Del.-D.C., Okla., Mo., Minn.

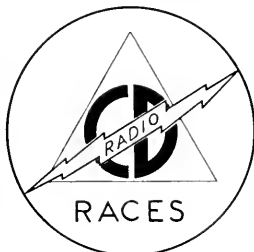
SCM W9RQM says his SEC, W9OVO, has reported EC activities 46 consecutive months, and he thinks that's a record. Any challengers?

## RACES News

Amateurs in the New England States, New York and New Jersey (FCDA Region I), will be readying themselves for the April 30th test of RACES facilities to be held in that FCDA Region. If you live in Region I (above states), it behooves you to get signed up in your local AREC or/and RACES group with a view to contributing your strength to this display of amateur radio potential. The First Region is just a guinea pig, to give FCDA an idea what can be expected of amateurs and RACES in the forthcoming June 14th-15th nationwide exercise. Organizers in other regions please take note that *your region is not being left out*. While there will be no other FCDA-sponsored tests on that date, the capability of amateurs in RACES in your region will be judged on the basis of the performance of amateurs in Region I, and plans for the June nationwide test made accordingly. So this April 30th test is not a signal for you to relax and let Region I do it, but a notice to make sure your region can make as good a showing as Region I in any test of your RACES facilities, real or fancied.

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Some time ago ARRL sponsored, at FCDA request, a competition to design a RACES emblem, to be adopted as the official RACES emblem by FCDA. Many suggestions were received and sent down to FCDA for consideration. After extensive deliberation, a design most nearly following one suggested by W1JMY was adopted and promulgated as the official RACES insignia as of March 4, 1954. We don't believe we have ever reproduced this emblem in *QST*. Note that there is room for inclusion of the name of a city or county (or even a state) at the top of the emblem, and such inclusion is contemplated. This emblem can be used by RACES personnel in the same manner as the regular civil defense insignia, as prescribed by FCDA regulations on July 12, 1952. We wish to express belated thanks to all amateurs who submitted a design, some of them at considerable trouble.



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The Warning and Communications Office of FCDA now has Charles E. Dewey, W8LBM, formerly W0LBM of Jefferson City, Mo., on its staff to implement the RACES program. Charlie is no stranger to us, having participated with us in the week-long FCDA Communications Conference at Olney, Md., in 1951. He is also no stranger to RACES, having served as RACES state radio officer for Missouri. Another amateur will soon be on the FCDA staff to assist Charlie in this work, so we can look for some progress from that level, and additional material from time to time for this column. Other amateurs at FCDA headquarters, not necessarily having any connection with RACES, are Communications Specialists W4KCZ (ex-K3FBG, W9KCZ, V04AC, 9EMC), W4DLA (ex-W3SEI, W2SEI), W8UTQ (ex-W4CGK, KL7YT), and Electronics Engineer W3UII (ex-W5UH).

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In the future, we'll endeavor to include items on RACES under this subhead. This will include, but not be restricted to, information coming out of FCDA Headquarters each month. Short items from the field will be welcomed and will be reproduced herewith after editorial consideration concerning their suitability. Let us hear what's going on in your RACES unit.



These amateurs in Georgetown, S. C., were among the first to feel the impact of Hurricane Hazel as she swept inland last October. From left to right, kneeling: W4KTI, W4ZGP; standing: W4DYP, K4ADP, W4FTN.

## GROUP CODE INSTRUCTION

Affiliated clubs planning a series of lessons designed to aid the code trainee would do well to note the availability of ARRL training aids. One of the most useful items, a TG-10 keyer, produces an audio tone from inked paper tapes. The tapes are available for use with the keyer or may be made by use of another item, a BC-1016 inked tape recorder. We'll be pleased to supply copies of a Reference Guide for Code Trainees to help get things started. Have a club officer write to Communications Department for further information on reserving a keyer or recorder for one convenient month-long period.

## BRIEFS

Propagation tests to determine the possibility of maintaining continuous reliable communication on 2, 6, 75, 80 and 160 meters are being conducted in New York, New England and New Jersey, each week end from 1800 EST Friday to 1800 Saturday. Sponsored by amateurs at Rensselaer Polytechnic Institute, the tests are expected to furnish valuable data to the services performed by amateur radio as well as amateur communications in general. The following frequencies are being used: 1815, 3509.5, and 3993 kc.; and 53.5 and 145.47 Mc. Persons interested in participating are requested to contact Roger Salaman, Hunt II, RPI, Troy, New York.

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The WAM award will be made to any amateur submitting confirmation of two-way radio contact with all sixteen counties in Maine any time after 12:01 A.M. January 1, 1955. Inquiries or petitions for awards should be addressed to the Portland Amateur Wireless Association, 97 State Street, Portland, Maine.

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A "Ground-Wave Contest" was held November 20, 1954, by the Breezeshooter's group, W3SIR reports. Competition for contacts was scored for winners in four zones, Zones 1-2-3-4 being, respectively, in 25-, 50-, 75- and 100-mile concentric circles centered on Pittsburgh, Penna. Winners and their scores: W3QYF 164, W3SJK 156, W3VUZ 125 in Zone 1; W8FRV 96 in Zone 2; W3WJF/3 81 in Zone 3; WSGAB 176 in Zone 4.



## TRAFFIC TOPICS

We thought that this month a few data from the new Net Directory might be of interest. It's quite a production, consisting of 14 multilithed pages and registering 357 net names as of December 15, 1954 — the biggest Net Directory we've put out yet. These 357 net names are registered on 193 frequency channels throughout six amateur bands. As usual, the 3.5–4.0 Mc. band carries the brunt of the net load, with 101 frequency channels being utilized by 233 nets in that band. This is slightly less than 5 kc. per channel. The 3.5–3.7 Mc. segment uses 47 channels (4.25 kc. per channel) and the 3.8–4.0 Mc. segment used 41 channels (4.88 kc. per channel). There are 12 channels used in the 160-meter band, 9 on forty c.w., 36 on ten, 7 on six and 27 on two meters.

Of the 357 registered net names, 304 indicated their purpose. There were 237 nets which indicated a single purpose; the others indicated dual or triple purposes. Of the single-purpose nets, 118 were devoted to traffic, 111 to emergency preparedness, and 8 to rag-chewing. There are also 47 nets devoted to both traffic and emergency work, 11 to traffic and rag-chewing, 7 to emergency and rag-chewing, and 2 to traffic, emergency and rag-chewing. This means that 178 nets can be called traffic nets, 167 can be called emergency nets, and 28 can be called rag-chewing nets.

The net directory is now available free of charge upon request, and we hope that net organizers, participants and potential participants will make the best possible use of it.

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There still seems to be some confusion regarding counting of net traffic. As usual, ARRL has set a standard, and this standard is followed throughout the National Traffic System. Whether or not your net follows that standard is up to you, of course. In the past, we have assumed that net traffic reported in this column has followed the League's simple net traffic counting system. If such has not always been the case, then there has been little or no basis for comparison between the traffic totals of the various nets reported.

The net traffic is that traffic handled by the net in *directed session*. It is *not* the traffic total of each station in the net; it is *not* the total of all traffic reported into the net. It is purely and simply the number of message *handlings* between the time of net call-up and QNF. If a message is sent from one net station to another, at the direction of the NCS, and properly QSLd at the receiving station, that's one point. The net traffic total is simply the number of times this process is repeated during a net session. The same message cannot be counted twice unless it is sent and received twice in the net.

It would help if we all followed this simple and logical procedure. Let's not get net traffic counting mixed up with individual station traffic totals.

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Miscellaneous January net reports: College Net — 63 stations called in, 12 messages handled. Early Bird Transcontinental Phone Net — 813 messages. North Texas Oklahoma Section Net — 319 messages, 979 check-ins. Transcontinental Relay Net — 31 sessions, five stations, traffic total of 1260. Transcontinental Phone Net (1st Dist.) — 16 stations, traffic total 1817.

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W0LJW sends in an amusing little story. It seems his QTH is afflicted with severe line noise. One evening in participating in TLCN (Iowa NTS Section Net), he discovered there was traffic for his city. He called W0CGY on the landline to ask his assistance, only to learn that CGY's transmitter was out of operation. They got the traffic through, though. W0CGY did the receiving, called the "breaks" to his XYL who relayed them over the landline to W0LJW, who did the breaking and asking for repeats. W0LJW says "everything went fine except for the NCS, W0BLH, who thought we were slightly nuts."

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WN5GQN reports the organization of a net for Novices in Texas. It is called the Texas Novice Traffic Net (TNT) and operates on 7191 kc. at 1900 CST on Tuesdays. Dave (WN5GQN) says all Novices are welcome and gives the following threefold purpose of the net: (1) to provide an opportunity for Novices to learn correct operating procedure; (2) for public service; (3) one of very few organized Novice activities.

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National Traffic System. Conditions continue being unkind to us. NTS nets have been beset with the worst kinds of

difficulties because of the long skip setting in at about 1900 local time each evening. Someone not too familiar with organized traffic work recently asked us why we were so unadaptable, why we didn't simply handle our traffic at a different time, just as the DX man adapts himself to working DX at a different time when conditions demand it. Well, to some extent we have done this. The independent net without any system can do it easily, provided a new net time is convenient to its members. But NTS must operate in chronological sequence; its nets telescope into each other. One of the main purposes of NTS is to work together as a national system, and you can't do this when every net operates at a different time, handles traffic from and for all over the map, and pays no slight attention to when other units of the same system operate, or where, or what they do.

These "bad" conditions, however, tend to lead us in this direction. A section net, because it can hear distant stations but not its own, either becomes a net taking in a lot of territory, or it moves to an earlier meeting time. No doubt about it, the present state of the radio spectrum is conducive to hodgepodge in traffic systems. What are we going to do about it?

Nothing. Just wait. Just continue doing the best we can and wait for conditions to get back to where they used to be when NTS was first put into operation. Maybe then, too, we can return to a more normal and uniform NTS time schedule.

### January Reports:

Net	Sessions	Traffic	Rate	Average	Representation
EAN	20	529	0.82	26.4	90%
CAN	21	664	0.68	31.6	97
PAN	26	1012	0.81	38.9	96
1RN	23 *	144	0.28	6.2	85
2RN	52	266	0.25	5.1	89
3RN	41	216	0.51	5.3	82
4RN	42	176	0.38	4.0	29
RN5	44	486	0.65	11.0	62
RN6	30 **	181		6	
RN7	40	136		3.4	36
SRN	32	128		4	7
TEN	68	1886		27.7	64
TRN	35	104	0.31	3	76
Sections***	402	2005		5	
TCC (Eastern)		239			
TCC (Central)		587			
TCC (Pacific)		256			

Summary	876	9015	EAN	9.1	CAN
Record	876	9015		12.1	

### Late Reports:

NEB (Nebr.) (Nov.)	27	215	8
NEB (Nebr.) (Dec.)	27	268	9.9
MCN (Conn.)	26	249	9.6

\* Out of 26 sessions held

\*\* Out of 47 sessions held

\*\*\* Section nets reporting: NEB (Nebr.); TLCN (Iowa); QKS & QKS-SS (Kans.); CN (Conn.); ILN (Ill.); Tenn. Regular and Tenn. Early; AENB & AENP (Ala.); SCN (Calif.); WSN (Wash.); KYN (Ky.); Minn. Phone.

Several NTSSers have asked us how we calculate the "rate" above, and a couple of managers have disagreed that the way we do it indicates anything. The "rate" is the number of messages handled per minute during the busiest session of the month. It indicates the net's efficiency "under load." We apply it only to NTS regional and area nets, since the achievement of a high rate of traffic handling is perhaps of less importance at section level where the main objective is representation. Accuracy, of course, is paramount at any speed.

W2LPJ reports that the early session of 2RN at 1815 EST is handling most of the traffic. The dragnet is out for a new 3RN manager, with W3ONB wishing to be relieved; we ought to have one by this time. Arkansas and Mississippi remain problems on RN5; new RN5 certificates have been issued to W4TYU, W4WOG, W5CAF, and W5MXQ. RN7 is completely without representation from Saskatchewan and Alberta, and during January had very little from Montana and Alaska. New 8RN certificates have been issued to W8s ILP, LHV and MQQ. W9UNJ has difficulty in getting NCS reports in 9RN, thus the lack of statistics above; W4KKW, W9CCO, K4FBW and K9FCA have earned 9RN certificates. VE3AUU is a newcomer to the TRN roster.



TCC continues to function with the usual difficulties, mostly brought about by the need for additional personnel and inability of existing operators to make contact with their TCC schedules. W8UPB, for Eastern Area TCC, reports that there were 34 TCC QNIs into area nets during January, with W8DQG handling the greatest amount of traffic. He needs two regulars, one on Tuesday to relay traffic to PAN via direct schedule, and one on Monday (late) to receive traffic from PAN. Other schedules are functioning, but many of them are irregular. W9JUI, for Central Area TCC, reports that schedules are working nicely, but whenever missed the station concerned makes direct contact with the Pacific Area Net to clear traffic. In the Pacific Area, W6HC reports that all TCC stations are active, but having difficulties. W0EKQ handled the most traffic (102). The latest Pacific Area TCC roster shows W6UTV deleted and W6PKL/0 added to the list.

There are still some openings in the TCC roster. Write W8UPB, W9JUI or W6HC, if interested.

## BRASS POUNDERS LEAGUE

Winners of BPL Certificates for January traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	112	1138	751	326	2327
W0BDR	1	1071	1053	15	2140
KA2FC	328	842	777	65	2012
K0AIR	19	927	892	36	1874
W3WIK	73	845	790	45	1753
W7BA	12	865	845	18	1740
W1GCU	35	1652	18	12	1717
W08CA	2	853	846	2	1703
W9JUI	21	777	711	28	1537
W4PFC	6	620	600	15	1241
W9NZZ	270	463	0	460	1193
W7PGY	51	517	488	29	1085
W9DO	18	519	433	104	1074
W2KEB	53	561	306	96	1016
W0CPI	6	482	425	57	970
W7APF	15	471	470	1	957
K4WBG	186	255	413	22	876
W0GAR	18	372	371	9	770
W4PL	7	372	344	26	743
W2KFF	28	401	234	37	720
W6YDK	20	339	251	88	698
W6SWP	53	307	240	63	663
W7VAZ	20	319	302	17	658
W5KPB	5	311	237	62	615
W3WV	21	330	211	36	598
W9TT	3	328	260	0	591
W2LPJ	23	269	239	53	584
W7FRU	4	283	214	69	570
W9VBZ	58	263	201	35	557
W5BKIL	8	270	210	68	556
W5MSH	3	276	276	0	555
W4PUJ	17	259	231	29	536
W6GQY	7	240	280	6	533
W0PZO	5	266	258	3	532
W2RUF	23	275	168	55	521
W4UHA	166	181	165	1	513
W6BJ	22	241	224	25	512
W3CVE	275	118	53	65	511
W5MN	14	246	215	29	504
W4YIP/6	2	315	65	120	502

Late Reports:

W7FRU (Dec.)	8	759	617	138	1522
W7WAT (Dec.)	35	240	229	14	518

## More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6IAB	59	1552	1384	168	3163
KR6KS	213	809	682	127	1831
KA2GE	124	629	547	82	1382
K4FDY	33	761	523	15	1322
K4TSL	334	181	106	696	1317
K4WAR	221	430	528	123	1302
KA2AK	337	363	296	67	1063
K9FCA	0	394	491	22	907
K0WBB	19	435	407	28	889
W6BS	28	376	340	26	770
K6WAY	30	247	260	21	558
K6FDG	87	217	147	60	511

BPL for 100 or more originations-plus deliveries:

W4HDR	209	W6CMN	118	KA2WW	102
KA2HQ	187	W0GAH	117	W4PDP	101
W2ELI	150	W0A	114	K3WBJ	100
VE2CA	136	W0GBJ	108	Late Report:	
K5FFB	119	K2HZR	102	K2BJS	
W4DVR	118	W9PQA	102	(Nov.)	108

BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: W1BDI, K1WAB, W2LPJ, W2RUF, W4DVR, W4PUJ, K6FCY, W6ZPJ, W5FQ, W5RO, W9TT, W0FQB, W0KQD, W0TQD, KA2HQ.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies, within 48 hours of receipt, in standard ARRL form.

## NONDIRECTIONAL CQs?

When W1WPO heard a T12 calling "CQ NO USA" on 7 Mc, one evening recently, he moved near the Costa Rican's frequency and called "CQ NO T12." The T12 promptly called W1WPO and a friendly rag chew resulted. . . . W1VG reports use of nondirectional CQs with ringing success. Three times in a row Pete called "CQ NO ASIA" and sure enough, no Asians replied!

## ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are required on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested: (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]  
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the . . . . .  
. . . . . ARRL Section of the . . . . .  
Division, hereby nominate . . . . .  
as candidate for Section Communications Manager for this  
Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— F. E. Handy, Communications Manager

Section	Closing Date	SCM	Present Term Ends
Yukon*	Apr. 15, 1955	W. R. Williamson	Mar. 17, 1949
West Indies	Apr. 15, 1955	William Werner	Aug. 15, 1952
Utah	Apr. 15, 1955	Floyd L. Hinshaw	Feb. 18, 1954
Nebraska	Apr. 15, 1955	Floyd B. Campbell	Aug. 15, 1954
Saskatchewan*	Apr. 15, 1955	Harold R. Horn	Dec. 15, 1954
Colorado	Apr. 15, 1955	Karl Brueggeman	Feb. 16, 1955
Maine	Apr. 15, 1955	Bernard Seamon	Apr. 16, 1955
Wyoming	Apr. 15, 1955	Wallace J. Ritter	June 15, 1955
Eastern Penn- sylvania	Apr. 15, 1955	W. H. Wiand	June 15, 1955
San Joaquin			
Valley	Apr. 15, 1955	Edward L. Bewley	June 15, 1955
South Dakota	Apr. 15, 1955	J. W. Sikorski	July 2, 1955
New York City—			
Long Island	May 16, 1955	Carleton L. Coleman	July 31, 1955
Eastern Florida	June 15, 1955	John W. Hollister	Aug. 14, 1955
San Francisco	June 15, 1955	Walter A. Buckley	Aug. 14, 1955
Southern New			
Jersey	June 15, 1955	Herbert C. Brooks	Aug. 26, 1955
West Virginia	July 15, 1955	Albert H. Hix	Sept. 18, 1955

\* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

## DX CENTURY CLUB AWARDS

W1FH	258	W3BES	248	W8NBK	246
W6VFR	251	G2PL	247	W6SYG	245
W6AM	252	W3G1ID	246	PY2CK	245
W6ENY	251	W6MEK	246	W2AGW	244
W81GW	251	W6SN	246	W3JTC	244
W0YXO	250			W3KT	244

### Radiotelephone

PY2CK	238	W1JCN	215	W9RBI	210
W7FH	230	W1MCW	215	SM5KP	207
VQ4ERR	226	NEAC	215	W3JNN	206
ZS6BW	221	W1NWO	214	W6DI	205
		WSHGW	214		

From January 15, to February 15, 1955 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

### NEW MEMBERS

W1TYQ	433	W5CCJ	404	W8HML	400
CN5EG	413	W0YZO	404	W9EUF	400
W9GNU	407	PA6HJK	403	PA6FAB	400
		W6ONS	401		

### Radiotelephone

W8MWL	411	W4HIB	401	W5SFT	400
LUSBS	402	W2FZO	400	W8QDU	400

### ENDORSEMENTS

CE3AG	234	W2UWD	168	W4OSU	130
W3EPV	230	W5MET	167	W9NN	130
W6SAL	223	PAORC	161	EA4BH	130
W6TL	220	W1ENV	160	OZ8SS	129
W8RKP	220	G3DOG	160	W5KBU	128
W6DI	211	W7AJS	154	W4QCW	122
W8DAW	211	W9RQM	152	W2ZGB	120
W8WZ	201	ON4MS	152	VE7YR	120
G3DO	201	W3ECR	148	G6VC	118
ZS6FN	195	W8MFL	147	K2BT	117
W24J	192	W6BUO	146	W7PZ	116
W2EMW	192	W3AZG	139	W8MWL	115
W7HIA	192	W2GYD	136	W1NIB	114
W8MPW	190	W2ESO	131	W1RIB	114
EA2CA	182	W9WFS	131	W3NCF	112
W3KOF	181	W1ODW	130	W2SUC	111
W5KUR	180	W4GHP	130	W6SWG	111
W6LDJ	174	W4HYW	130	W1MTG	110
W3LVF	170			W8ILG	110

### Radiotelephone

W1ZAM	201	W9JFF	163	G2M1	150
Z12GX	183	P9HF	161	W6GYM	141
EA2CA	181	W5DMD	160	W5KBU	120
ZS6FN	171	LUDMG	160	W8VDJ	120

### W/VE/VO Call Area and Continental Leaders

W4RPD	241	VE2WV	181	VE8AA	160
W5MIS	243	VE3QD	210	VO6EP	190
W7AMX	240	VE4RO	223	4X4RE	210
W9NDA	240	VE5QZ	140	Z86BW	229
VE1HG	150	VE6GD	108	Z12GX	235
		VE7HC	209		

### Radiotelephone

W2APU	202	W0AIW	175	VE4RO	120
W4HA	177	VE1CR	120	VE7MZ	140
W5RGP	205	VE2WW	102	OD5AB	150
W7HIA	181	VE3KF	163	ZLHY	190

## ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Minnesota	Charles M. Bove, W9MNC	Feb. 17, 1955
Oregon	Edward F. Conyngham, W7ESJ	Mar. 1, 1955
Manitoba	John Polmark, VE4HL	Mar. 2, 1955
British Columbia	Peter M. McIntyre, VE7JT	Mar. 13, 1955
Santa Barbara	William B. Farwell, W6QJW	Apr. 12, 1955
Southern Texas	Morley Bartholomew, W5QDX	Apr. 29, 1955

See special notice in New England Division this month concerning Western Massachusetts.

In the Hawaii Section of the Pacific Division, Mr. Samuel H. Lewbel, KH6AED, and Mr. Richard L. Hoyt, KH6AVO, were nominated. Mr. Lewbel received 96 votes and Mr. Hoyt received 42 votes. Mr. Lewbel's term of office began Feb. 3, 1955.

In the Mississippi Section of the Delta Division, Mr. Julian G. Blakely, W5WZY, and Mr. A. C. McKinney, W5JR, were nominated. Mr. Blakely received 75 votes

and Mr. McKinney received 71 votes. Mr. Blakely's term of office began Mar. 8, 1955.

In the Missouri Section of the Midwest Division, Mr. James W. Hoover, W0GEP, and Mr. Gerald N. McReynolds, W0MFB, were nominated. Mr. Hoover received 178 votes and Mr. McReynolds received 144 votes. Mr. Hoover's term of office began Mar. 1, 1955.

In the Western Pennsylvania Section of the Atlantic Division, Mr. Richard M. Heck, W3NCD, and Mr. Anthony J. Mroczka, W3UHN, were nominated. Mr. Heck received 253 votes and Mr. Mroczka received 162 votes. Mr. Heck's term of office began Mar. 17, 1955.

In the Maryland-Delaware-District of Columbia Section of the Atlantic Division, Mr. J. W. Gore, W3PRL, Mr. Harold E. Archer, W3SKK, and Mr. W. Lloyd Carter, W3UWO, were nominated. Mr. Gore received 204 votes, Mr. Archer received 191 votes, and Mr. Carter received 175 votes. Mr. Gore's term of office began Mar. 21, 1955.

## BRIEFS

The Tri-County Amateur Radio Club of Brattleboro, Vt., is offering a handsome certificate to any amateur submitting proof (QSLs or Vermont QSO Party logs) of two-way communication with amateurs in 13 of Vermont's 14 counties. Send confirmations to Ray N. Flood, W1FPS, 2 Marlboro Avenue, Brattleboro, Vt. See page 100 for details on the Vermont QSO Party, scheduled for Apr. 9th-10th.

Amateur radio in the Wisconsin area is looked upon by educators as being a vital educational experience. As reported by W9OTL, at a Milwaukee meeting of the Wisconsin Education Association in November, 1953, a group of teachers organized the Amateur Radio Section of the WEA and set up plans for the Wisconsin Educator's Phone Net. This basic organization has coordinated the efforts of state school amateur radio clubs. Its individual members have demonstrated amateur radio to thousands of students with the result that several new school radio clubs have been organized and dozens of students licensed. To help train Novices in code and message handling, 3735 kc. is used as a net frequency at 1220 CST and 1630 CST on all school days. The spot 3850 kc. will continue as the WEA's 'phone net frequency at 1000 CST Saturday and 1530 CST on the second and fourth Friday of each school month.

## CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on April 13th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,010, 52,000 and 145,600 kc. The next qualifying run from J60WFP only will be transmitted on April 1st at 2100 PST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions will be made from W1AW each evening at 2130 EST through April 23rd; after that date they will be at 2130 EDT. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes the order of words in each line of QST text sometimes is reversed.

### Date Subject of Practice Text from February QST

Apr. 5th:	A C.W. Man's Control Unit, p. 11
Apr. 7th:	A Crystal-Controlled 144-Mc. Converter, . . . p. 15
Apr. 11th:	A Variable Bandwidth Filter, p. 17
Apr. 15th:	A Three-Bandmultiplier-Driver, p. 20
Apr. 18th:	Remote End-Ped Antenna, . . . p. 24
Apr. 21st:	A Loudspeaker Enclosure, . . . p. 26
Apr. 26th:	A Steerable Array for 7 and 14 Mc., p. 28
Apr. 29th:	Meet "Junior" — He's No Lid!, p. 31

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

## ATLANTIC DIVISION

**EASTERN PENNSYLVANIA**—SCM, W. H. Wiand, W3BIP—SEC, IGW, RM: AXA, PAM: PYF, E. Pa. Nets: 3610, 3850 kc. The following clubs report new officers for 1955: Electric City ARC elected LCK, pres.; OST, vice-pres.; NNH, secy.; LJT, treas. Northeast RC of Philadelphia elected VOC, pres.; TYX, vice-pres.; MYL, treas.; K2JUW, rec. secy.; DYI, corr. secy.; KIW, DWR, HYJ, CLC, and JQP, exec. board. South Philly (SPARK) elected QIZ, pres.; FZR, vice-pres.; VSD, secy.; ZMO, treas. ARK, Pottstown ARA president and a newly-appointed OO, came up with a suggestion that is worth the attention of all clubs dealing with the training of Novices. In monitoring the Novice bands with the aid of two receivers, one tuned to the fundamental, the other tuned to the second harmonic frequency, ARK has found not only strong harmonic radiation from many in the Novice bands but a surprising amount of stations calling CQ in vain on the "out-of-the-amateur-band" second-harmonic frequency without a trace of these stations on the expected fundamental frequency. This leads Jack to believe that these stations are in need of training in the use of a grid-dip oscillator or absorption-type wavemeter. Also, further training in the proper methods of antenna-to-transmitter coupling. All clubs might include this in their Novice training program. These stations need our help. It's up to those of us with the know-how to give all the help possible. BES and EAN report attending the joint meeting of the FRC/PVRC in Washington where about 80 turned out to hear about FOSAJ and Navassars expeditions. JNQ says he lost 15 pounds while "batching it." PYF is home again after a three-week business trip that took him through Texas and Oklahoma. CUL also is back home after enjoying a fine trip to Florida. During the January 18th Aurora opening, TDF worked Illinois on 2 meters to bring his total states worked to seventeen. In answer to many queries regarding the forthcoming SCM election, yours truly will bow out in favor of someone with more time to devote to the job. My sincere thanks for your cooperation and good luck to my successor. Traffic: (Jan.) W3CUL 2327, BFF 180, ELI 155, OK 121, UKJ 116, OZV 108, TEJ 102, VVV 95, QIZ 94, WUE 88, DU1 58, AXA 50, UOE 45, GES 42, GIY 26, PYF 23, YAZ 21, KCG 11, JNQ 7, PVY 7, UUA 2, BES 1. (Dec.) W3AXA 124, ABT 6, EAN 4.

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA**—SCM, Arthur W. Plummer, W3EQK—TDV, SJF, and NUV will be trying for the 21,000-Mc. record this year and also are going to try 30,000 Mc. NUV will be on 420-Mc. TV before long. The ARA officers are VAM, pres.; YRK, vice-pres.; NZT, secy.-treas.; OXL, act. mgr.; and RAH, net comm. mgr. The ARA also passed a motion that a year's subscription to QST shall be awarded to the club winner of any ARRL-sponsored contest. PQ sends the SCM a very kind letter which we now publicly acknowledge. FU reports a fine ESARC meeting at Cy's place on the Snow Hill Road Jan. 28th at which a swell General Electric movie was shown. Maurice Mowbray, the blind radio and TV serviceman of Federalsburg, Md., is sporting the call AAR and a Viking II. JM, FU, VCN, BSV, and BM are active with a.s.b. AED is stirring up mobile interest with his new rig. The ESARC's big winter meeting was held at the English Grill in Salisbury Feb. 25th. WN3AKT and WN3AKU have been added to the Washington County rolls with the help of VAM, radio instructor at the Hagerstown High School. Harford County, through the efforts of LDD and Paul Seward, CDRO for the County, expects to get a Viking II and an NC183-D. LDD got his S-40 back in operation again. SCPN still is on night instruction duty for Philco. 9QOI broke into the Harford County Net with a potent signal, it is reported. CVE reports 50SZ and

6BMW approved as TCRN members. KL7ATO/9, ex-9EBL, who is a TCRN operator, is now 9XQW. K3WBJ uses BC-610, HRO-60, and three-element beam on 20, Viking II and HRO-M with Windham on 40, and Viking I with HQ-140X and 800-ft. long wire on 80 meters. ISDO, chief operator at the Army Medical Center, operates MARS nets plus CS3AC and OE13USA Mon. through Sat. on 20 meters. RV is now operating OK on 54,520 kc. HUA, pastor of the Northwestern Presbyterian Church in Washington, D. C., as well as Current Moderator of the Presbytery in D. C., is active again after a lay-off of several years and is on 40-meter 'phone. PPK has a new receiver and is on 20 meters. Brig. Gen. Heaton, Commanding General of Walter Reed Hospital, the Army Medical Center, is studying code and theory in preparation for the exam for a ham ticket. All the operators at K3WBJ, as well as the trustee, Walter Reed Hospital Chief Chaplain, Lt. Col. A. V. Bradley, WVI, are teaching 75 patients and duty personnel who are interested in becoming hams! TLU has been assigned to full time duty at WBJ. PQ formerly was 9PQ and also held 8KRT and 3HRQ. WAF finally made WAS. EEB has been helping WN3AHW to get on the air. KCY has just purchased a Johnson Viking Adventurer and OSF has one on order. QCB says he is attending a school where he is getting 37 weeks of training in 30 days! CDQ reports she was on 20-meter c.w. during the month of January. The Washington Radio Club has code classes going again and PZA is being reactivated. TGF reports the DuPont High School in Wilmington, through the efforts of WBZ, now has some Novice licensees. Thus far the licensed hams in the P. S. DuPont High School are W3WBZ, WDA, WCY, and TGF. Novices are WN3ARE and WN3ASB. ECP has been lining up some 6- and 2-meter equipment. With his new 60-watt Ranger BYI has worked OE1FF, OZ7OM, DL2WV, PA0DV, GM3JXR, PY5PG, EA9AP, G3JTC, KZ5DK, and LU5G, as well as OA5G and others. Other low-power specialists in the area are IXJ, TDV, and OEJ. VZM is installing a four-element wide-spaced beam with a 40-ft. boom on a 70-ft. tower. HEC raised his 20-meter beam to 60 feet. Your SCM, EQK, wants to take this opportunity to thank all for their interest in ARRL and their good wishes and kind remarks. Traffic: (Jan.) W3WV 598, CYE 511, K3WBJ 360, W3PKC 242, UE 169, RV 82, ECP 53, GRB 38, PQ 17, HC 15, CQS 9, JZY 7, EQK 5, OYX 5, NNX 4, WKB 4, WAF 2. (Dec.) W3MCG 85, ECP 18, OYX 11, TGF 1.

**SOUTHERN NEW JERSEY**—SCM, Herbert C. Brooks, K2BG—PAM: ZI, K2JIG, ex-3BOX, is now located in Glassboro and is at present on 20-meter c.w. K2GYM received his General Class ticket and K2ARP and W2HEK are consistent operators in Salem County. K2GKV, Pennsgrove, promises to keep us posted on news from that area. 5DYG, ex-2DGN, is now located in Tulsa, Okla. Look for Russ on 40 meters. SJRA members enjoyed a talk presented at their January meeting by 3SHY, assisted by 3EOZ, entitled "Single Sideband Techniques." K2EY, ex-3OS, Westmont, is on 10 meters. SDB urged all SJRA DXers to take part in the International DX Contest. UAE, Trenton, is operating on 75-meter 'phone. BAY is building a 10-meter vertical. The new QTH of 9RQK/2 is Lawrenceville. SUG, Milford, reports activities curtailed because of business and travel. K2H2R made BPL again this month. The 10th Annual Old Timers Net Round-Up and the 25th Anniversary of DYRA will be held Apr. 23rd at the Hotel Stacy Trent, Trenton, N. J. Contact ZI for details. ZQ is net control of the N. J. 75-meter Net which meets Sun. at 0900 on 3900 kc. Glad to have VU (Lt. Col. Kale) back in the U. S. The Burlington County Radio Club station, K2KED, is holding regular drills on 2 and 10 meters. A big increase of activity reports (Form 1) is greatly appreciated. Keep up the good work. Traffic: (Jan.) W2RG 163, K2H2R 155, W2ZVW 58, ZI 38, YRW 19, K2BG 17. (Dec.) W2ZVW 131, K2CPR 5.

**WESTERN NEW YORK**—SCM, Edward G. Graf, W2SJV—Asst. SCM: Jeanne Walker, 2BTB. SEC: UTH/FRL, RM: RUF, PAMs: GSS and NAI. NYS meets on 3616 kc. at 6:30 p.m. and 3925 kc. at 7 p.m.; NYSS on 3595 kc. at 8 p.m.; NYS C.D. on 3509.5 and 3993 kc. at 9 a.m. Sun.; TCPN 2nd call area on 3970 kc. at 7 p.m.; SRPN on 3970 kc. at 10 a.m.; ISN on 3980 at 3 p.m. Are you an AREC member? It is important that your EC have your registration and know when you are available for emergency work. Register NOW. RAWNY now is licensed under the call PE in memory of one of its founders and a charter member. First project of the new ARAT is a course for Novices instructed by OUJ. CARS also is holding classes in code and theory under the direction of GDI. RPO spoke

at a KBT meeting on "TVI Filters." PGU made DXCC and WAC. K2DYB is organizing a 6-meter AREC net in Madison County. UHI spoke at an ARAT meeting on S.S.B. and JUL on Power Supplies for the Beginner. The Elmira ARA was guided on a tour of the Flicking station by D. Hamilton. The RARA v.h.f. group met at the home of K2CEH. K2s DXY and GYU helped Q1HH put up a skywire 50-ft. high. GBX has been appointed OBS. K2s CEH, DYC, and EVJ are OBS. UTH/FRU renewed as SEC. SJV and UTH again are appointed as Asst. Directors, Atlantic Division. V.h.f. enthusiasts in the Syracuse Area are forming a v.h.f. club. Contact RHQ for details. UFI lost 144.220 and 420-Mc. beams in a recent storm. HAX, VLV, UFI, and K2EPH are on 420 Mc. The KBT meeting was devoted to a discussion of "Operation and Uses of Oscilloscopes." K2CUQ graduated 3 pupils from the Novice training class. EIMW finally received a QSL from Heard Is. ALR addressed RAWNY on "Amateur Test Equipment." UXP has 832 final into a sixteen-element beam on 220 Mc. K2DVC built a 15-meter beam per Jan. QST but redesigned it to also work on 20 meters. 1UHL/2, KN2s JVH, IMI, and JVG are trying to establish an amateur radio club at the U. of Rochester. Stations in Oswego, Fulton, Auburn, Cortland, Watertown, Rome, Utica, Oneida, and Syracuse are requested to contact CYD, Onondaga Co. EC, to establish contact for Red Cross traffic between these cities and Onondaga Co. Red Cross Hq. Remember the Western New York Hamfest May 21st, sponsored by the RARA, at Dowd Post, American Legion, Route 31, West of Rochester City Line. KN2s JTT and LXB are new stations on 2 meters. UHI, PPL, JUL, and AFY are on s.s.b. UTH has a "V" beam directed at Europe. CZT has a new s.s.b. RCA is active on 15-meter 'phone working Gs, Fs, and ONS with 60 watts. PPR remote controls his rig from the bedroom. GUR dropped the "N." KWF is a new call in Rochester. At the RARA "Ladies Nite" meeting C. A. Kinsley, of Eastman Kodak, spoke on "Traveling with your Color Camera," and QCF on Color TV. Traffic: (Jan.) W2RUF 521, ZRC 160, DXV 150, OE 117, DSS 59, K2DSR 36, DJN 36, W2UTH 21, Q1HH 20, RQF 20, FEB 12, K2CUQ 11, W2EMW 5. (Dec.) W2DXV 120, GBX 56, LXE 54, CPN 4.

**WESTERN PENNSYLVANIA**—SCM, R. M. Heck, W3NCU—SEC: GEG, RMs: UHN, GEG, and NUG. PAMs: AER and LXE. The W. Pa. Traffic Net meets at 7 p.m. 3555 kc. and reports for January show 241 stations reporting and 108 messages handled. In the Pennsylvania County QSO Contest, sponsored by the Western Pennsylvania Amateur Radio Club Council, top scorers and award winners were KUN, State award; GJY, Western Penna. award; and ANA, Eastern Penna. award. The RAE is starting its second session of code and theory classes at the YMCA. On 10 meters are RVG, YKE, and YWL. OIH visited LIT and tried out his 75-meter s.s.b. YKE's brother, Doug, and pal, VNB, have joined the USAF. Guests at a recent RAE meeting were IKW and 8BDV. The MCRA's code classes, conducted by GEG assisted by other club members, are attended by approximately 40 persons. The South Hills Brass Pounders and Modulators elected QNI, pres.; QWW, vice-pres.; LDB, secy.; WFR, treas. VKS, the hamfest chairman, has high hopes of making the Aug. 7th affair the best ever. OUG is on 10 meters. 8UMR is putting up a 60-ft. mast for 10- and 15-meter antennas. KLP is a 10-meter fan. WEJ is on 10 and 40 meters. QYF and NCP both have 62-ft. masts and are on 10 meters. SJK worked Alaska on 15 meters. KKY is on 40 meters. The Breeze Shooters Net meets Mon. at 8 p.m. on 29 Mc. and has a hamfest scheduled for May 22nd. The Bucktail Amateur Radio Club (YDW) Net meets Mon. at 6:30 p.m. on 29,080 kc. WHO resigned as vice-president and SUL will fill the balance of the term. WEL is on 80-meter c.w.; RMX is 10-meter mobile; TCP is building test equipment, also radio-controlled planes; NMJ is on 80-meter c.w.; RVS, Cameron County EC and c.d. Radio Officer, is sporting a new Ranger; KUN is on 80-meter c.w.; SUL is mobile on 10 and 80 meters; TYC was active in the YLRL C.W. Contest; HIX is hard at work on 15-meter dipole, crystal grinding, s.s.b. exciter and various projects for the club station, YDW. ZKY has the Naval Reserve call N4KHB. OGN is recovering from an operation. NGZ is completing a crystal 10-meter converter. WIL, on 40 meters, has finished a cathode modulator with 6S17/6Y6. VEE is building a crystal calibrator. Traffic: W3WJQ 1753, LMMI 267, OEZ 99, LXQ 92, YA 76, UHN 59, KUN 56, VKD 24, NMJ 23, GJY 20, NCD 19, NUG 18, KNQ 15, UTR 10, AEV 6, SIJ 6, UTX 4, PWN 2.

## CENTRAL DIVISION

**ILLINOIS**—SCM, George T. Schreiber, W9YIX. Section nets: ILN c.w., 3515 kc. Mon. through Sat.; IEN 'phone, 3940 kc. RMs: BUC and MRQ. PAMs: UQT, EC; HOA. EC Cook County: HPG. Club elections: Hamfesters—GVO, pres.; PCB, vice-pres.; YNV, treas.; IGC, fin. secy.; IWR, sgt. at arms; EGY, rec. secy.; WOL, FCO. AVH, KNP, and DKA, directors. Tri-Town Amateur Radio Club—ABI, pres.; KIKN, secy.; and Novice FRZ, treas. Oak Park and River Forest Amateur Radio Club—BWV, pres.; KOR, secy.; KAJ, treas.; and ZFH, act. mgr. AA built up a suppressor grid modulator for his RK-20 for

a little 'phone ragchewing. SXL did some shielding on his TV set and killed a lot of QRM to his ham rig. He received his Old Timers Club certificate. We hear the gang in Peoria has started a city net on 1883 kc. An ILN contest is needed there, fellows, and we will carry your traffic out. GUW, ODT, and AQP are enthusiastic boosters of s.s.b. and plan higher power. HJS sticks to lower-powered mobile and has fun. New Novice calls are LYB and LYC. New OOs are ERU, PVD, and KKN. DO, AA, and K9FCA made BPL. USI is working hard at his OBS duties, both on 40 and 2 meters, with good response from his "customers." FRP and GBT renewed OPS appointments; the latter has had continuous service since 1938. FRP, SME, CEE, and YIX renewed ORS appointments. VVJ is rebuilding his rig and enjoys IEN. Our sympathy to ICF, who lost his mother. BA is NCS and KPW alternate for the 10th Air Force MARS Net. A group of the after-midnight ragchewers on 40-meter 'phone sprang a surprise visit on DA. They included BNZ, ZGV, QBB, MCM, ERR, and TNH. PHE had a little beam trouble. DRN deplores the fact that there are so few stations on 432 Mc. So far he has heard and worked AGM, ZQ1, and EFD. OO TALL observes that some of us are getting careless with out-of-band operation on 160 meters. KN2KNI/9, stationed at the Ground Observers Detachment in Chicago, is the first Novice "K" call we have heard from. BRD is changing QTH again. Watch for it at the heading of his DX column. SKR still is experimenting with loaded dipoles. Congrats to NIU on the new jr. operator. KQK built a citizen's band transmitter for a neighborhood juvenile to control a boat model. EYG was issued certificate No. 62 by the St. Clair Amateur Radio Club for working ten St. Clair County stations. KQL is the new trustee for the Sangamon Valley Radio Club station. He, with PRN, GOJ, and ERC, have established a strictly walkie-talkie defense net in Springfield. CQC has gone to a kw. on all bands, including DX. PXT, stung by inactivity, built a Heathkit rig to keep his hand in. OAL is teaching the XYL the code. YLU enjoys 160 meters with an Elmac. MTQ finally licked the parasites and now is on all bands with an 813. Fifteen meters looks good to GTI and he and EWR have a contest all their own. JEC says his rig for 420 Mc. looks like part of a space ship. ULB is going to write President Ike regarding TV sets causing trouble to his ham rig. NN is running out of wall space for certificates. His latest is D.U.F. Amateurs in the northwest suburbs of Chicago are checking a Novice who drops the "N" in his call and slips into the forbidden portions of the band with a VFO. YIX is accused of having ghost writers of this dope. But it isn't true, fellows; send in your items not later than the fifth of the month and see. PGW gets better reports, he claims, from his mobile rig than ATH does on his home equipment. Traffic: (Jan.) W9DO 1074, K9FCA 907, W9AA 244, IDA 149, USA 118, SME 77, OR 56, QQG 44, STZ 31, LXJ 29, VHD 28, YIX 27, MRQ 25, BUK 18, FRP 16, PHE 12, BRD 11, BA 8, HFG 4, NIU 2. (Dec.) W9IDA 316, OR 218, UVM 17.

**INDIANA**—SCM, George H. Graue, W9RKJ—Section Nets: IFN 3910 kc. daily 0900 and 1730 CST; QIN 3656 kc. Mon. through Sat. 1600, 1730, and 2200 CST; RFN 3656 kc. Sun. 0900. CYC is at the helm again with an entire new station. IUJ is active over three nets. NZZ still is QRL with Arctic skeds. IJ received a BPL medalion. SIQ/9 has a new Viking II with VFO. WWT has applied for OBS appointment. WRO's modulator transformer blew up again. QYQ has a new s.s.b. exciter. AYP and JWI have new Johnson mobile rigs. DOK was host to an Explorer B. S. Troop. RBX took the commercial class exams. GDL is the cabin station of STFC. AZH is on 75-meter 'phone. DKR has a new VFO. HLY is working 20 meters with cubical quad per Jan. QST. DGA enjoyed his first CD 'Phone Party. NHI still is working DX on 160 meters. PPS is one of the operators at YB. UNT received a Viking II for Christmas. HMR is assembling a Viking II. IOH reports there is ham gear on 147.3 Mc. at State Police Post at Charleston for c.d. work. CCARG officers are LSG, pres.; DKC, vice-pres.; IRT, secy.-treas. IRT is Clark County EC. DFW, HRY, LSG, IRT, and WNI have new rigs on the air. N9NHV is new in Jeffersonville. Mike and Key Club officers are UWT, pres.; UVD, vice-pres.; VCA, secy.-treas. FXY, Martinsville High School station, assisted for exams N9NF, NCK, and NPS. ISC is new at Columbia City. New at Sullivan is RAM. BSZ has resigned as EC for Grant County. DNA donated a ditto machine to the LCARC for club bulletins. ZYP built a new VFO. Newly-elected officers of TARS are DGA, pres.; UMS, vice-pres.; OVB, secy.; and RBV, treas. TARS's new meeting place is at the Community Center, Eighth and Main St. HQF has 127 confirmed on DXCC. DGA has 123, and EHU has 96. DPE is headed for K7-Land. ZZY is rebuilding. DLACT-9MXE was named Airman of the Month in DL-Land. DIR has been nominated for Air Academy at Denver. FFH is an ensign in the Navy. RIV has new 75A-3. LDB is trying to organize a club at the high school in Elwood. DQI has dropped the "N" and is 2-meter mobile. CKD is new in Indianapolis. IIMS has dropped the "N." N9LCQ is new in Griffith. WKN is building a new final. ACN has a new Sky King. EIHZ is building an s.s.b. slicer. OFD has a new 500-watt final. WWT reports total traffic for RFN as 195; YIP for IFN with a total of 182. Traffic: W9JUL 1537, NZZ 1193,

(Continued on page 84)

## WHAT IS A MICROVOLT?



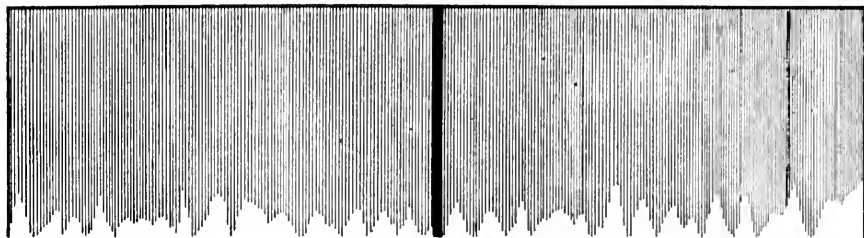
A MICROVOLT of r.f. across the antenna terminals produces an audible and quieting carrier on a sensitive receiver (A) under laboratory conditions with a signal generator producing the microvolt. The receiver is then placed in an amateur station.

A less sensitive receiver (B) in the same station under identical operating conditions produces a quieter and more audible received signal than receiver (A).

What is the difference? The noise figure could be better in (B) but when measured (A) is found to be superior.

The answer, of course, is selectivity. Consider a segment of frequency with a signal in its center. (Fig. 1) The grass on both sides of the signal is noise, mainly man-made and well above the thermal noise of the first r.f. stage.

Fig. 1



Consider selectivity as a window. The narrower the window, the greater the selectivity. By placing the signal in the center of the window, receivers (A) and (B) are Figures 2 and 3 respectively.

Fig. 2

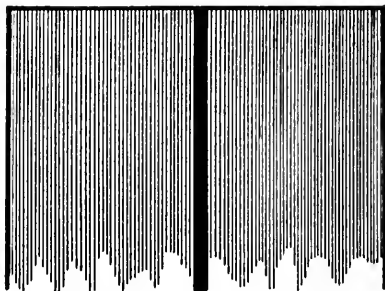
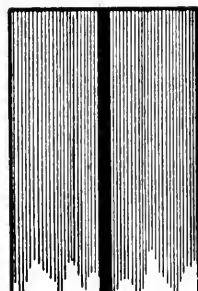


Fig. 3



Receiver (A) window contains the wanted signal plus a lot of useless noise. (B) window contains mainly signal. (B) will have the greater operating sensitivity, since most of its accepted spectrum is signal.

Below 30 Mc. the noise figure of a receiver is seldom realized due to man-made noise. Selectivity, therefore, is the important function in the majority of cases with the noise figure, not so important.

At UHF noise figure is a good measure of operating sensitivity since a given receiver may utilize its i.f. gain until the amplified thermal noise of its own first stages becomes objectionable. Man-made noise at these frequencies is low enough to permit this condition.

The criterion then for a good communications receiver becomes one of excellent selectivity with sensitivity or noise figure of secondary importance, depending upon the operating frequency.

Robert Kurth, W9CDO

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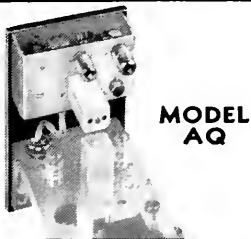
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**MODEL AQ**



**MODEL DQ**



**MODEL B SLICER**

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3. Attractive Desk Model, for installation directly into receiver.

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<b>CONNECTICUT</b>	<b>Indianapolis:</b> Graham Electronic Supply Co.	MICHIGAN	<b>Newark:</b> Hudson Radio & TV Corp.
<b>New Haven:</b> Radio Shack Corp.	IOWA	<b>Battle Creek:</b> Electronic Supply Corp.	<b>Plainfield:</b> LaFayette Radio Corp.
<b>New London:</b> Aikins Electronics Supplies.	<b>Council Bluffs:</b> World Radio Laboratories.	<b>Grand Rapids:</b> Radio Elec. Supply Co.	<b>Trenton:</b> Allen & Hurley Co.
<b>DELAWARE</b>	<b>Des Moines:</b> Bob & Jack's Store For Hams. Radio Trade Supply Co.	<b>Kalamazoo:</b> Warren Radio Co.	NEW MEXICO
<b>Wilmington:</b> Delaware Electronics Supply. Radio Elec. Ser. Co. of Del.	<b>Fort Dodge:</b> Ken-Els Radio Supply.		<b>Albuquerque:</b> Radio Equipment Co.
	<b>Sioux City:</b> Burghardt Radio Supply Co.		

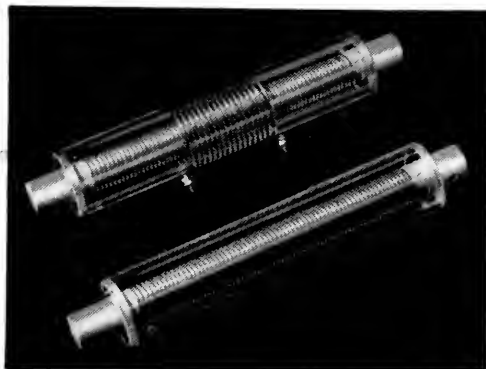
# "SECRET" OF MOSLEY BEAM PERFORMANCE

**Is The Superior Materials And  
Construction Of The Loading Coils**

MOSLEY coils are machine-wound on forms of the highest grade ceramic. No loose hand-wound turns that slip and change inductance to ruin beam performance. For added protection, MOSLEY coils are also enclosed in weather-proof covers so that hot or cold — wet or dry, you get the same fine performance. They stay tuned on the nose — handle a Kilowatt with ease! Link coupling to radiator coil matches 52 ohm coax line.

Poorly constructed loading coils are false economy if it's enduring beam performance that you want! Compare MOSLEY quality, materials and workmanship. See them at your distributor or write for brochure.

**Mosley Electronics, Inc.**  
8622 ST. CHARLES ROCK ROAD, ST. LOUIS 14, MISSOURI



*New! Models for 10, 11, 15 Meters*

**MOSLEY 2 ELEMENT 10, 11 OR 15 METER BEAM** Model #VPA 1015-2. Can be adjusted for either band or changed at any time. Forward gain: 5db. Front-to-back ratio: 15 db. SWR: 1.2 to 1 at resonant frequency .....\$49.95

**MOSLEY 3 ELEMENT 10, 11 OR 15 METER BEAM** Model #VPA 1015-3 Can be preset for either band or changed anytime. Forward gain: 7.5 db. Front-to-back ratio: 20 db. SWR: 1.2 to 1 at resonant frequency .....\$69.95

## THE POPULAR "VEST POCKET" BEAMS

### NEW YORK

**Buffalo:**  
Radio Equipment Corp.  
**New York:**  
Arrow Electronics, Inc.  
Harrison Radio Corp.  
Harvey Radio Co.  
Hudson Radio & TV Corp.  
Midway Radio Corp.  
Niagara-Concord  
Radio Wire & TV Corp.  
Terminal Radio Corp.  
**Bellemore, L. I.:**  
Rand Electronic Distr's.  
**Blue Point, L. I.:**  
Standard Parts Corp.  
**Hempstead, L. I.:**  
Arrow Electronics, Inc.  
Standard Parts Corp.  
**Jamaica, L. I.:**  
Harrison Radio Corp.

### NORTH DAKOTA

**Fargo:**  
Fargo Radio Service Co.

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**Columbus:**  
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Radio, Inc.

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Portland Radio Supply Co.  
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**Allentown:**  
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**Ellwood City:**  
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Radio Distributing Co.  
**Johnstown:**  
Radio Parts Co.  
**Philadelphia:**  
A. C. Radio Co.  
Almo Radio Co.  
Eugene G. Wile Co.  
Radio Elec. Ser. Co.  
of Penn., Inc.  
**Reading:**  
George D. Barbey Co.  
**Sunbury:**  
Electronic Sales & Ser.  
**Providence:**  
DeMambo Radio Supply, Inc.  
W. H. Edwards Co., Inc.  
**Watertown:**  
Burghardt Radio Supply.  
**Chattanooga:**  
Curl Radio Supply.  
**Memphis:**  
Bluff City Distributing Co.

### SOUTH DAKOTA

**Watertown:**  
Burghardt Radio Supply.

### TENNESSEE

### TEXAS

**Abilene:**  
R & R Elec. Co. of Abilene  
**Austin:**  
Texas Electronic Sup., Inc.  
**Beaumont:**  
Montague Radio Distr. Co.  
**Corpus Christi:**  
Electronic Equip. & Eng. Co.  
**Dallas:**  
Adleta Co.  
Crabtree's White Radio Co.  
Ra — Tel Co.  
**Houston:**  
Busacker Elec. Equip. Co., Inc.  
**San Angelo:**  
Gunter Wholesale Co.  
**San Antonio:**  
Lamp's Electronics, Ltd.  
**Waco:**  
Hargis Co., Inc.  
**Wichita Falls:**  
Clark & Gose Radio Supply.

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Iverson Electric Supply.  
Tri-State Electronic Supply.  
**Salt Lake City:**  
Standard Supply Co.

### VERMONT

**White River Junction:**  
Electronic Supply, Inc.

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**Norfolk:**  
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**Richmond:**  
Radio Supply Co., Inc.

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**Everett:**  
Pringle Wholesale Co.  
**Tacoma:**  
C & G Radio Supply Co.

### WEST VIRGINIA

**Charleston:**  
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**Milwaukee:**  
Radio Parts Co., Inc.

### DISTRICT OF COLUMBIA

**Washington:**  
Capitol Radio Wholesalers, Inc.  
Kenyon Radio Supply Co.

### ALASKA

**Anchorage:**  
Yukon Radio Supply, Inc.  
**Juneau:**  
Alaska Radio Supply Co.

### CANADA

**Calgary, Alberta:**  
Smalley's Radio, Ltd.

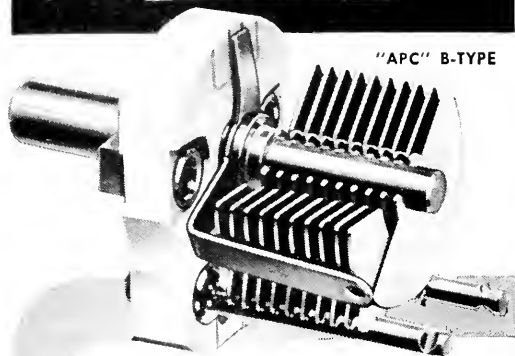
### COSTA RICA

**San Jose:**  
R. Castro & Cia., Ltd.

### HAWAII

**Honolulu:**  
Radio Television Corp.  
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# AT YOUR DEALERS



## APC Capacitors With E-X-T-E-N-D-E-D Shafts

In response to many requests from amateurs, experimenters and electronic equipment builders, Hammarlund is now offering APC — B Type, and MAPC — B Type Capacitors as standard items through Hammarlund Authorized Dealers.

These are extended-shaft versions of the well-known APC and MAPC capacitors. They permit knob-control or shaft coupling.

The original APC trimmer was designed and first produced by Hammarlund more than 20 years ago, and is used in all classes of equipment where a compact high-quality air dielectric trimmer is needed. The MAPC type is similar to the APC except that it is a miniaturized version.

Range of the APC series is from 3 to 140 mmf and for the MAPC, 2.3 to 100 mmf.



For your free copy of the Hammarlund Capacitor Catalog, which gives listings of the complete line of standard capacitors, write to The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1. Ask for Bulletin C4.

# HAMMARLUND

(Continued from page 78)

TT 591, UQP 194, WWT 160, PQA 158, JBQ 133, WSIQJ/9 131, W9WRO 120, QYQ 88, EHZ 85, TG 60, ZRP 59, CTF 53, ZYK 49, TQC 46, NTA 44, BKJ 42, SCT 38, SKT 37, YB 37, AYP 31, VNV 31, YIP 29, DOK 26, SVL 26, RBX 20, CMT 17, QR 17, CEA 16, FGX 14, BDP 10, CC 10, EGQ 8, GDL 8, AXF 7, YVS 6, DKR 5, DGA 4, HLY 4, PIN 4, UWU 4, BXG 3, NU 3, LFV 2, PPS 1.

**WISCONSIN** — SCM, Reno W. Goetsch, W0RQM — SEC: OVO, PAMS: ESJ and GMY, RMs: IXA, RTP, and UNJ. Nets: BEN, 3950 kc., 6 p.m. daily; WIN, 3625 kc., 6 p.m. daily; WPN, 3950 kc., 1215 Mon-Sat, 0930 Sun, Wisconsin mobile and c.d. frequency: 29,620 kc. WIN operation was moved up to 5:30 p.m. to beat the long skip. VBZ has a new "short" beam for 14 Mc. ESJ has been toying with a 616 on 432 Mc. Net certificates (BEN) were issued to OVE and HHJ. We trust that by this time IXA has recovered from the attack of virus pneumonia which put him out of business for a while. CCO now has coax feed on his 80-meter antenna. UTV has a new c.w. rig with 80 watts to a pair of 807s, 80-meter DX worked by RKP includes PA0, DLI, G, VPI, KV4, KP4, VP7, and ZL. RQK is looking for Wisconsin stations on 14-Mc. "phone while at school in New Jersey. QXE moved to Minnesota and is now a W0. Net certificates (WPN) were issued to LEE, LUQ, FXW, BTN, and YFU. SAA reports 1049 QNI in December. New officers of the Racine Racecycle Club are BVG, pres.; LXV, vice-pres.; YZA, secy.-treas. They plan to equip the Racine six agency c.d. truck with gear for RACES operation. The M. & M. Club held its Charter Night party Jan. 29th. CCO is now NCS on WIN Wed. SZL is director of communications for Racine c.d. SDK has a new SX-96 receiver, FCF QSOed ZHE/MI in Madison via 61JU on 21 Mc. FLARC (Madison) elected as new officers RBL, pres.; LNM, vice-pres.; YWI, secy.; MQK, treas.; and DIG, INO, and HHR, directors. LHR has a B7 W 5100 transmitter and HQ-140X receiver. OVO has been working 21 Mc. with his mobile. Traffic: W9VBZ 557, ESJ 232, CXY 176, IXA 67, SAA 63, CCO 59, RTP 57, UIM 50, UTV 24, LAG 19, FFC 9, RQM 9, GMY 8, IQW 8, HU 7, KWJ 6, RKP 5, SZR 3, OVO 2, RQK 1.

## DAKOTA DIVISION

**NORTH DAKOTA** — SCM, Earl C. Kirkeby, W0HNV — The Lake Region Amateur Radio Club at its last regular meeting formulated plans for a code and theory class for Novices, to be held in Devil's Lake. The members also are working on a club 2-meter project. We wish them much luck as there is very little 2-meter activity in the State at present. The Sioux Amateur Assn., at Grand Forks, has purchased a kw. transmitter from a government agency and is busy converting it to the ham bands. We are sorry to say that this will be our last report as SCM. We just don't have the time to devote to the job that it deserves. Thanks to all those faithful boys who reported every month. Traffic: W0FVC 37, BFM 11.

**SOUTH DAKOTA** — SCM, J. W. Sikorski, W0RRN — Asst. SCMs: Earl Shirley, 0YQR, and Martha Shirley, 0ZWL. SEC: GCP, PAMS: GDE, BNA, NEO, and PRL. RM: SMV, DVB and EQN registered with the AREC from Lead. SMV won the SFARC 7-Mc. WAS Contest, with HON, BLZ, PHR, RRN, OOO, and RWE also winning prizes. Officers for '55 of the Prairie Dog ARC are HFE, pres.; ZVY, vice-pres.; EUJ, secy.-treas.; THF, chief operator; RLA, custodian; GDE, publicity; SCT, editor. The PDARC received an inquiry about its "Who's Who in South Dakota Hamdom" from England. Net activities for January: 160-net, 30 sessions, 838 QNI, traffic 98; C.W.-Net, 13 sessions, 113 QNI, traffic 50; 75-Net, 30 sessions, 1010 QNI, traffic 113; NJQ-Net, 24 sessions, 628 QNI, traffic not reported. DES is back on the air with a Ranger after many years absence. UVL has a new daughter — his first "harmonic." North Hills hams have formed a new club, with AEN, pres.; Merle Reese, vice-pres.; DVB, secy.; and Arne Sjomelung, treas. Traffic: W0SMV 59, MPQ 42, BLZ 41, SCT 41, PHR 11, OOO 7, BQS 6, DVB 6, RSP 6, RRN 4.

**MINNESOTA** — SCM, Charles M. Bove, W0MNC — KJZ now has worked all states on 80-meter c.w. TMZ's wife is now WN0ZR. YNY is located in Dawson and is on 75 meters. Albert Lea reports 4 new hams, WN0BZY, ZBL, ZJC, and ZLR. VEZ, at Murdock, bought JDO's old transmitter and JDO bought LVG's rig. The MJN Junior Slow-Speed Net on 3690 kc. changed time to 1700 CST. While we are mentioning nets, you can check into the MSN C.W. Net on 3595, MJN on 3690 kc. at 1800 and the MSN "Phone Nets on 3820 kc. at 1205 and 1800 CST. The Mesabi Net meets on 1895 kc. at 1900 on Mon. and Fri. EQS is going into the Navy. TYV and OJP have dropped the "N" from their calls. PBL is sporting a new Gonset 500-watt final on his 10-A s.s.b. rig. Your SEC, GTX, now has 417 AREC members signed up. Out of this group there are 140 mobiles. George is to be commended for the fine job he has done as Emergency Coordinator. The St. Cloud Mike and Key Club has been reactivated and meets the 3rd Mon. of each month at 7 p.m. For meeting place call RVO, Phone 2986, and ask for Bob. HPS and his XYL, PYC, are moving to

(Continued on page 86)

# THE HQ-140-X...

## HAS "MORE THAN MEETS THE EYE"!



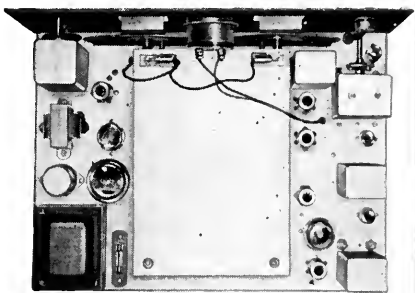
Just looking at the outside of an HQ-140-X communications receiver isn't enough, when you're in the

market for a new rig. Sure, it's in an attractive case that's built for rugged service; and the controls are comfortably placed for lengthy DX operations. But, it's what's inside the cabinet that's important.

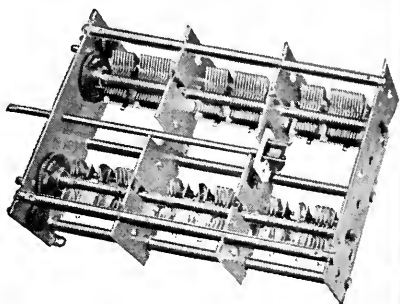
For example, the HQ-140-X offers a professional-type tube lineup. The use of a separate mixer (6BE6) and oscillator (6C4) contribute to the high degree of oscillator stability. Modern 6BA6's are used for the RF amplifier and for all three stages of IF amplification for maximum efficiency.

The nine individual sections of the band-spread capacitor, and the six sections that make up the main tuning capacitor, at all times maintain the proper L/C ratio regardless of what part of the receiver's range (540 Kc to 31 Mc) you use. Plates are heavy brass, soldered to their shafts, built into a large sturdy frame for rugged use.

Features like those described above rate high with 'hams' the world over. For detailed information on the HQ-140-X, write to The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1, New York. Ask for Bulletin R4.



**HQ-140-X  
Top View**



**Sectionalized Tuning  
Capacitor Assembly**



# HAMMARLUND

SINCE 1910

## Heathkit GRID DIP METER KIT



The invaluable instrument for all Hams. Numerous applications such as retuning, neutralization, locating parasites, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1½ meter Ham bands. Complete frequency coverage from 2–250 Mc, using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at \$3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial

with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

MODEL GD-1B

**\$19.50** Ship. Wt.  
4 lbs.

## Heathkit ANTENNA COUPLER KIT



The new Heathkit Antenna Coupler Model AC-1 was specifically designed to operate with the Heathkit Amateur Transmitter and will operate with any transmitter not exceeding 75 watts RF input power. Rugged design has resulted in a sturdy, well shielded unit featuring a copper plated chassis and shield compartment. Coaxial 52 ohm receptacle on the rear of the chassis connects

to a three section Pi-type low pass filter with a cut-off frequency of 36 Mc. Tuning network consists of a variable capacitance and tapped inductance in an impedance matching unit.

Capacitively coupled neon lamp serves as a tuning indicator and will also provide a rough indication of power output.

MODEL AC-1

**\$14.50** Ship. Wt.  
4 lbs.

## Heathkit IMPEDANCE METER KIT



MODEL  
AM-1

The Heathkit Antenna Impedance Meter is basically a resistance type standing wave ratio bridge, with one arm a variable resistance. In this manner it is possible to measure radiation resistance and resonant frequency and antenna transmission line impedance; approximate SWR and optimum receiver input. Use it also as a monitor or as a field strength meter where high sensitivity is not required. Frequency range of the AM-1 is 0–150 Mc and range of impedance measurements 0–600 ohms. The circuit uses a 100 microampere Simpson meter as a sensi-

tive null indicator. Shielded aluminum light weight cabinet. Strong self supporting antenna terminals.

**\$14.50** Ship. Wt.  
2 lbs.

**HEATH COMPANY**  
BENTON HARBOR 9, MICHIGAN

Mahtomedi. The 1954 Ten Thousand Lakes QSO Party was a success. Twenty-three certificates have been issued. The three highest scoring stations in Minnesota were HAH, KJZ, and LUX. Rodolfo Montero, who attended school in Minnesota and is a good friend of LUX, returned to his home at Vigan-Ilocos Sur in the Philippine Islands. Rodolfo has a burning desire to be a ham. To help him out LUX gave him a Heathkit receiver and Gonset code oscillator with key and also sent about \$130 in assorted gear. Traffic: WOKLG 221, KFN 106, QBW 105, HIN 104, WMA 96, QNY 85, DQJ 78, HUX 57, RVO 57, IRJ 54, GTX 41, TQQ 32, UCV 32, RQJ 26, TXN 25, TUS 23, QDP 22, EHO 20, LST 20, BZG 19, GGO 19, HMC 18, ABA 11, BUO 11, CLO 9, KNR 9, NTV 9, ALW 8, HNV 8, LUX 8, QGD 8, ZTB 7, OPA 6, VOA 6, FIT 5, WAA 1.

### DELTA DIVISION

**ARKANSAS**—SCM, Owen G. Mahaffey, W5FMF—SXM reports he has his Extra Class license. Congratulations, Grover, MSH is RM and is trying hard to get the c.w. net going. New appointments: LUX, MRD, and DRW as ECs; MSH and LUX as ORSs; BAB as OBS, TNM, EVB, and BAB paid us a visit. We're always glad to see you. WN5FBG is a new ham in Clarksdale. LUX has a new modulation transformer and will be on with a new 'phone rig soon. LRE writes that he is in charge of telephone service in Frankfurt, Germany. CAF says he is recuperating from both an illness and a fire and will be back on the net soon. Traffic: W5MSH 555, FMF 25, PX 6, LUX 1, SXM 1.

**LOUISIANA**—SCM, Thomas J. Morgavi, W5FMO—The Single Sidesband Dinner staged at a famous New Orleans restaurant was a huge success. Among those attending were HHT, TDY, IMT, IMU, ABS, VEU, UKQ, ZSP, ZNI, DLA, LFF, and SUM. LFF and SUM visited your SCM the morning after their whirlwind tour of the French Quarter. WQP is a proud pappy, a girl. She modulates his Viking better than Jerry. NDV meets with NTS, RN5, CAN, CFN, and TXN to continue as high scorer for Louisiana. DGB has been down with the flu but is up and around again. GXO was in the hospital for an operation but is on the road to recovery. FMO lost part of his 20-meter beam during a recent windstorm. He is building a new secondary standard consisting of a 100-ke. unit in a double oven and multivibrators for 100, 10, 1 and .1 kc. KHX is plagued with r.f. in the wrong places. SPZ made a tape recording of the last CD Test which was played back at a recent meeting of the Greater New Orleans ARC. It brought out to a lot of us our mistakes on net procedure along with some good points. An emergency net is being formed in New Orleans. Meeting time is 9:00 A.M. Sun. on 3825 kc. All AREC members are requested to report in at that time. Address queries in reference to this net to UQK or FMO. Four station activities report cards were received this month and that accounts for the lack of out-of-New Orleans news. Please send in your reports so that they are received not later than the 4th of the month. Traffic: W5NDV 92, EA 27, VIC 18, FMO 10.

**TENNESSEE**—SCM, Harry C. Simpson, W4SCF—SEC: RRV, PAM: PFP, RM: WQW. Congratulations to IIB on making DXCC with a maximum of 150 watts. WQW and PFP request more net attendance, although John still is enthused over the fifty stations who checked into the 'phone net one recent Sun. morning. CXY is doing a grand job as NCS of the new Novice Net which meets Mon., Wed., and Fri. at 1900 EST on 3737 kc. All Tennessee Novices are invited to participate. WQT has a new Slicer, and reports five new Novices in the Clarksville Area. OEZ reports on the Davidson County 2-meter Net, which now has 23 members in the Nashville Area. FUY has a new sixteen-element beam. The usual fine bulletin was received from the Upper Cumberland Net. PVD's DX score now is 113/90. UWA has a new VFO, VJ, IV, and UWA are new ORSs. Orchids to BER, PVD, ZJY, UWA, and the Cookeville Club for their fine publicity in newspapers concerning their emergency activities. TYU sent nice clippings and pictures with stories on Knoxville-Knox County activities, and a fine feature on the wonderful services TZD has performed for service personnel. FCD Regional Head YB, along with YEL and SCF, spoke to a full house at the Memphis Club. VKE, now at Northwestern, writes that he looks forward to QSOs over the school station, 9GBX. New Nashville Club officers are WHM, pres.; PRY, vice-pres.; and APH, secy-treas. RRV reports more links in the 6-meter state chain, with APJ at Crossville and BXP at Harriman. Traffic: (Jan.) W4PL 743, OGG 334, TYU 248, ZJY 222, PFP 129, PVD 110, TZD 80, IIB 78, PQP 73, WQW 66, SCF 59, HHI 57, UWA 54, RRV 44, VJ 41, BQG 40, CXY 34, IV 34, YMB 34, BHI 20, OEZ 16, UVS 14, APD 13, BBD 11, BAQ 10, PAH 8, RHK 8, FLW 6, UOA 5, DCH 4, Z 3, GFV 2, HX 2, IUT 2, UDI 2, NPS 1. (Dec.) W4ODR 110, UVS 26, WQT 21.

### GREAT LAKES DIVISION

**KENTUCKY**—SCM, Robert E. Fields, W4SBI—ZLK reports that he burned out his low-pass filter. YOK worked W6s HP and ELS on 80 meters. JCN is getting

(Continued on page 88)

# New Heathkit VFO KIT



MODEL VF-1

**\$1950**

Ship. Wt. 7 lbs.

- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical

and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandsread and features ceramic insulation and double bearings.

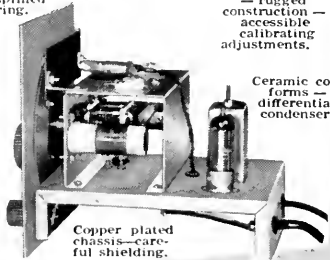
This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard 1/4" crystal holder. Construction is simple and wiring is easy.

Open layout—easy to build—simplified wiring.

Smooth acting illuminated dial drive.

Clean appearance—rugged construction—accessible calibrating adjustments.

Ceramic coil forms—differential condenser.



Copper plated chassis—careful shielding.

## Heathkit AMATEUR TRANSMITTER KIT



MODEL AT-1

**\$2950**

Ship. Wt. 16 lbs.

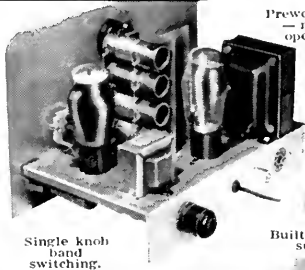
### SPECIFICATIONS:

Range 80, 40, 20, 15, 11, 10 meters.  
6AG7 ..... Oscillator-multiplier.  
6L6 ..... Amplifier-doubler.  
5U4G ..... Rectifier.  
105-125 Volt A.C. 50-60 cycles 100 watts. Size: 8 1/4 inch high x 13 1/2 inch wide x 7 inch deep.

Crystal or VFO excitation.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

Rugged, clean construction.



Prewound coils—metered operation.

52 ohm coaxial output.

Single knob band switching.

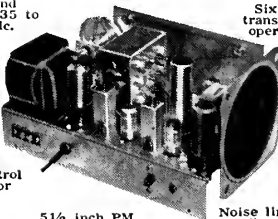
Built-in power supply.

## Heathkit COMMUNICATIONS RECEIVER KIT

Four band operation 535 to 35 Mc.

Stable BFO oscillator circuit.

RF gain control with AVC or MVC.



5 1/2 inch PM Speaker-Headphone Jack.

Six tube transformer operation.

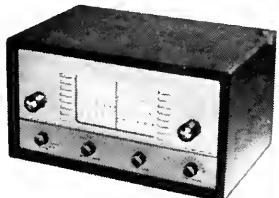
Electrical bandsread and scale.

Noise limiter—standby switch.

### SPECIFICATIONS:

Range.....535 Kc to 35 Mc  
12BE6 ..... Mixer-oscillator  
12BA6 ..... I. F. Amplifier  
12AV6 ..... Detector-AVC—audio  
12BA6 ..... B. F. O. oscillator  
12A6 ..... Beam power output  
5Y3GT ..... Rectifier  
105-125 volts A.C. 50-60 cycles, 45 watts.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandsread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.



MODEL AR-2

**\$2550**

Ship. Wt. 12 lbs.

### CABINET:

Proxylon impregnated fabric covered plywood cabinet. Ship. weight 5 lbs. Number 91-10, \$4.50.

**HEATH COMPANY**  
BENTON HARBOR 9, MICHIGAN



ready to go to 160 meters for a KYN Net that is being organized. K4FBW reports that it was a very poor traffic month with very little moving on any of the nets, both amateurs and MARS, NIZ and NGN report that on the night of Jan. 31st ten mobiles from Owensboro, Ky., and vicinity were dispatched by an amateur station set up at the March of Dimes Headquarters to pick up donations from those missed by the Mother's March. Newspaper and radio publicity, including a live rebroadcast of the hams in action, promoted good will for amateur radio. Forty-eight dispatches were made to the cars and nine messages sent from a second fixed station set up in the county headquarters to main headquarters. This provided a fast reporting system for county donation totals. Operation was on 29.6 Mc. Incidentally, the mobiles picked up more than \$100.00. CDA, Section Emergency Coordinator, urgently requests reports from ECs on the number of Emergency Corps members. Traffic: K4WBG 876, W4ZLK 106, K4FBW 60, W4HIS 51, CDA 41, RPF 34, N1ZL 381, SBI 32, VBA 30, JCN 15, OGP 14, YOK 4.

**MICHIGAN** — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: Joe Beljan, 8SCW; Bob Cooper, 8AQA, SEC; GJIL. New appointment: PHA as ORS. Newly-elected officers of the Grand Rapids Club are OCK, pres.; OPZ, vice-pres.; QOJ, secy.; CKK, treas.; TIJ and CPV, directors. Since this is the end of the road for me as SCM I want to thank the entire membership for splendid cooperation during my term of office. Special thanks go to those appointees who have helped to keep the organization functioning; the Assistant SCMs, the EC organization, the Route Managers and net control stations, and to all those whose attendance on the nets has been an inspiration to me. Your work has been deeply appreciated, and I hope you will continue to give the same support to the new SCM that you have given me. You have made an excellent choice in RAE as SCM. Tom is one of the old-timers of radio, and you will meet him on both 'phone and c.w. Again, many thanks; and I'll be seeing you. Traffic: (Jan.) W8NUL 215, ILP 116, ZLK 110, RTN 91, SCW 84, DAP 68, SJF 65, SWG 58, JKN 56, QIX 55, WYL 49, FX 44, IUJ 42, WXO 30, DSE 26, HKT 23, NTC 21, FSZ 18, NOH 17, HSG 12, AQA 10, OQH 8, PHM 8, INF 5, YDR 5, AUD 3, EGI 3, MEX 3, BRV 2. (Dec.) W8SCW 67, IUJ 44, TOP 13.

**OHIO** — SCM, John E. Siringer, W8AJW — Asst. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8NFB; and E. F. Bonnet, 8OVG. SEC: UPB. RMs: DAE and FYO. PAMs: EQN and HUX. New appointments include DVL as ORS, BHF as EC, and HOH as OES. We regret to report the deaths of ROX and WYE, both well known in the Cleveland Area. DSX, SRN Manager, reports that LHV and MQQ have been issued net certificates. Please note the announcement of the Ohio QSO Party. It is hoped that 1955 will produce more entries than the two previous years when 1953 netted 17 and 1954 showed 27. WE's XYL has worked 46 states. W8NUPH has worked 19 states in three weeks of operation. ZLP became the father of twins on Jan. 5th. NGW, QSL Manager, reports that approximately 500 W8s have cards on file but no envelopes. The Cleveland North-east gang has gotten a Viking Ranger for the clubhouse. A new organization, the Nameless Wonders, meets the first Fri. of each month at the Euclid YMCA on Babbitt Road. AQ has installed a ground plane for 10 and 15 meters. PS reports that he is helping Novices TTQ, TTX, and UCP to get on the air. DAE, BN Manager, is holding special net sessions on Sat. and Sun. at 11:00 a.m. The Fulton County Amateur Radio Club has been organized with SXU, pres.; ZIUQ, vice-pres.; VAQ, act. mgr.; and UPR, secy.-treas. Recently licensed Novices in the club are UAG, UAC, TTV, and VFO. GDQ has worked all states on 160-meter 'phone. FJP built an electronic keyer. GCP's favorite bird brought him his second son on Jan. 11th. BSRA (Akron) officers for 1955 are VQI, pres.; BFII, vice-pres.; CMC, secy.; and KCK, treas. Steubenville became the second city in Ohio to have its RACES plan approved. ERR is Radio Officer, ZRI is alternate, and DNQ is assistant. On Jan. 2nd the Travelers Motorcycle Club of Toledo held its annual "Snow Run" with 16 stations participating. VQP was declared the winner in Toledo's hidden transmitter hunt of Jan. 23rd. The Locking Valley Radio Club recently was organized with CRS, pres.; LQH, vice-pres.; and EFQ, treas. New officers of the Lake Geauga Radio Club are OXS, pres.; TPM, vice-pres.; W8NRCE, secy.-treas.; and OMZ, act. mgr. The club station, RWF, is being rebuilt and will have 75-, 10-, and 6-meter rigs. Dayton RF Carrier devotes much space to the coming Hamvention of Apr. 2nd. Other Dayton news: NFA made WAS on 40-meter c.w., FFM has moved to a new QTH, PLV had a QSO which lasted over an hour on 40-meter 'phone although running but four watts. RHG has a new 75A-3, FPZ is doing an excellent job in his training of c.d. operators and 7IIP has been transferred to Dayton. OVARA's *Ether Waves* shows that 13 members are over the 100 mark in countries worked with JIN, at 247, leading the pack. Springfield's Q-5 reports that JRG was the club winner in the SS Contest, with HBJ and RWZ taking second and third, respectively. The FIARA News Bulletin states that DMU is staying in Topeka, Kans.; DCE has finally gotten on mobile; and the Covered Dish Supper of January was a yelping success. The Toledo *Shack Gossip* informs us that OFG is going to town with a 6-watt rig; the

### THIRD ANNUAL OHIO INTRASTATE QSO PARTY APRIL 16-17

The Ohio Council of Amateur Radio Clubs will sponsor a QSO party, open to all Ohio amateurs, which will be held April 16-17, 1955, from 6:00 p.m. EST Saturday until 6:00 p.m. EST Sunday. All Ohio amateurs are urged to participate in this affair and to submit their logs to the contest manager.

Any and all amateur bands and any mode of emission may be used. There will be no power restrictions. Scoring: multiply the number of Ohio stations worked by the number of Ohio counties contacted. Each station may be worked but once regardless of band or mode of emission used. Logs should include call signs of stations worked, time, date, signal reports sent and received and the county in which the station is located. Operation near the following frequencies is recommended: 3550, 3740, 3860, 7100, and 7250. On the other bands, take your pick. The call "CQ Ohio" should be used on both 'phone and c.w. At least five appropriate certificates will be awarded to the highest scoring stations. Certificates will also be awarded to the Novices, the number of certificates being contingent upon the degree of activity.

All contest logs must be postmarked no later than May 1st, 1955, and should be sent to the contest manager, Hamlin King, W8EQN, 353 So. Arlington Ave., Springfield, Ohio.

WITs have a spanning new harmonic; new Novices are UPH, UPL, ULX, and TTH; YGR is building a new home; UEL has been transferred to California; and QCT has dropped the "N." The Columbus *Carascope* mentions that MRC is building a 20-meter Quad; OMY is going great guns on 15 meters; NPF is doing better than 30 w.p.m. on the mill; and LVF has returned from his tour of duty. North-eastern Ohio's *Ham Flashes* relates that BRG is now on 40-meter 'phone; SXG has a new Ranger; JIF is temporarily QRT while rebuilding; JWC has returned to the air; NUW has been released from the Navy; and the RACES plan for the Youngstown Area has been approved. Traffic: (Jan.) W8FYO 401, UPB 268, DAE 181, REL 171, ARO 105, AMH 84, MQQ 82, IFX 65, ILC 61, KDY 31, AJW 25, LZE 24, AL 23, EQN 20, LMB 19, HPP 15, QIE 12, VTF 12, AJH 11, TLW 10, RN 9, ET 8, GZ 8, LER 8, WE 7, HFE 6, OQP 6, RO 6, DL 4, GCP 4, HUX 4, NQQ 4, TJD 4, WJB 4, DMD 3, GDQ 3, BUM 2, LZR 2, WYL 2. (Dec.) W8REL 372, DQG 164, ZAU 80, DL 8, PBX 7, AQ 4.

### HUDSON DIVISION

**EASTERN NEW YORK** — SCM, Stephen J. Nenson, W2ILI — SEC: RTE. RM: TYC. PAMs: GDD and JIG. The SARA, one of our oldest clubs, celebrates its 25th anniversary. Its record of achievements has been outstanding and lists many "firsts" in the field of amateur radio. As an example, the first microwave communication on 2300 Mc. was established by RMA and RYT in the year 1945. During the same year, UKL and RDL set the DX record of 800 feet on 21,000 Mc. The newly-elected officers are YIV, pres.; ZBY, vice-pres.; GRI, secy.; K2HON, treas. The Club directors, NZE, UKL, K2AXY, and K2CKS, promise an outstanding program for the coming year. To all concerned, our hearty congratulations. LXP, past-president of AARA, was honored by the U. S. Air Force with a trip to Thule AFB in Greenland for distinguished service. Through a 'phone patch, Garry has permitted the boys of this isolated area to talk with their folks back home. To thank him, the trip was arranged by the Pentagon. Congrats, Garry, for a job well done. **NOTICE:** The MHT Net meets every Sat. at 1300 on 3716 kc. This will correct the error in our February report. The HHRL is sending a copy of its excellent bulletin to each club in Westchester in an effort to create closer relationship and interclub visitation. We hope for the speedy recovery of K2CA and K2AVY. New on 144 Mc. are K2EQQ and KN2GZM. K2KJV has a new model 12 Printer. The HHRL authority on RTTY is AWQ. K2AWII lost one of his new homes plus a 5-kw. generator earmarked for the HHRL Field Day activity. The recent banquet held by the RVWARS was well attended and the FB talk given by Vern Chambers, of ARRL, was enjoyed by all. Traffic: (Jan.) K2BJS 512, W2CFU 30, K2HVN 19, W2ANB 14, K2EHI 12, W2APH 4. (Dec.) K2BSD 313, BJS 147, BE 76. (Nov.) K2BJS 187.

**NEW YORK CITY AND LONG ISLAND** — SCM, Carleton L. Coleman, W2YBT — Asst. SCM: Harry J. Dannels, 2TUK. SEC: ZAI, PAM: JZX. RMs: VNJ and LPJ. ZAI reports AREC membership has increased in

(Continued on page 90)

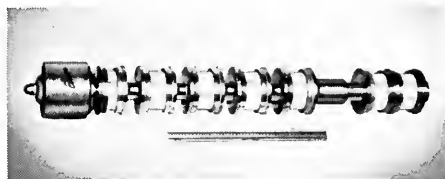


# What's New with the Electron?

*Latest power tube developments  
displayed by Eimac at annual  
I. R. E. show*

New and improved klystron, ceramic and negative grid tubes highlighted the Eimac display at the annual Institute of Radio Engineers show and convention in New York City, March 21-24.

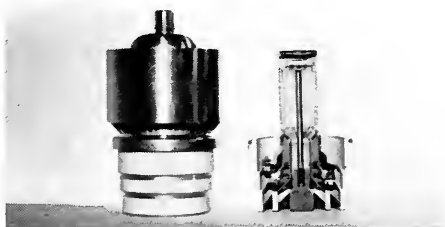
High power Eimac amplifier klystrons range in frequency from 225-3000mc and 5500-7500mc and vary in CW power output from 50 watts to 50kw. Application-proved Eimac amplifier klystrons such as type 3K50,000L,



*High power Eimac amplifier klystron*

delivering 10kw/CW power output at 400-1050mc, make possible high power previously limited to VHF and lower frequencies. These amplifier klystrons are of ceramic and copper construction and, although larger than negative grid tubes, are easily the lightest and least complicated of any klystrons intended for similar service. Small, rugged Eimac reflex klystrons are designed for local oscillator use as high as 9600mc in airborne environments.

Sharing the spotlight with klystrons were the latest in Eimac ceramic tube developments. Ceramic replaces glass in these tubes, giving a greater immunity to thermal and physical shock, plus allowing revolutionary construction techniques. In production, the ceramic and electrode parts are placed one on top of the other, similar to stacking



*Ceramic tetrode and cross-section*

poker chips. The copper metallized seals are the electrode terminals.

Eimac also announced improvements in popular commercial and military tube types such as the 3X2500A3 and 3X3000F1 power triodes, as well as new high vacuum rectifiers and water- and air-cooled tetrodes.

Along with the new, Eimac featured products that have been performance proved through years of operation in all types of commercial and military service. These tubes, of course, included the Big Six of Amateur Radio operation, the 4-65A, 4-125A, 4-250A, 4-400A and 4X150A radial-beam power tetrodes and 4E27A radial-beam power pentode.

New developments and standard line tubes shown at the I. R. E. show represent the leadership and reliability that have made Eimac the world's largest manufacturer of transmitting tubes.



*The Big Six of Amateur Radio: 4-65A, 4-125A, 4-250A, 4-400A, 4X150A, 4E27A*

*"What's New with the Electron," a brochure distributed at the I. R. E. show discussing Eimac tube developments of the past year is available upon request. Write our Amateurs' Service Bureau for your free copy.*

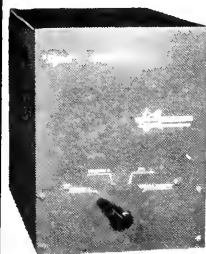


**EITEL-McCULLOUGH, INC.** SAN BRUNO, CALIFORNIA

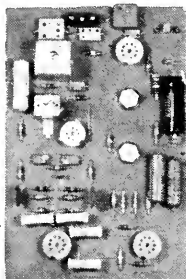
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# "Signal-Splitter"

the famous GE Signal Slicer circuit  
in a new form... PRINTED CIRCUIT



Wired &  
Tested  
with tubes  
**\$72.50**  
  
Kit with  
tubes  
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PA-I power  
supply.  
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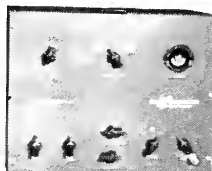


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Check these features

- ✓ kit requires ONLY 70 minutes wiring time
- ✓ for 455 KC receiver IF — provisions crystal controlling "SIGNAL — SPLITTER"
- ✓ plug in adaptor available for 50, 85, 100 and 915 KC receiver IF frequencies
- ✓ switch positions — SIDEBAND 1, SIDEBAND 2, BFO and NORMAL RECEIVER
- ✓ NORMAL RECEIVER switch position gives the original receiver conditions without adaptors
- ✓ 40 DB or more suppression on suppressed sideband
- ✓ requires 18 MA at 200-250 V and 1.2 A at 6.3 V from receiver
- ✓ plug in power supply available fits inside cabinet
- ✓ size 7" x 9" x 13" in gray hammertone and crackle cabinet
- ✓ connecting cables terminate in an octal plug

going PORTABLE or MOBILE SSB ???



then you need the new

## "Phasemaster-Jr."

(MODEL-C)

Wired & Tested  
with tubes **\$174.50**

Kit with tubes  
**\$147.50**

- same features as De Luxe "PHASEMASTER-JR" less power supply
- 60 watts peak envelope input SSB also AM, PM, and CW

Clubs write for open dates on interesting program

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MANUFACTURERS OF PRECISION ELECTRONIC EQUIPMENT

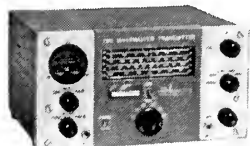
Brooklyn, Nassau, and Queens. VNJ is planning to reactivate the Section Training Net (NLT, 3710 kc.). All KNs and slow-speed General Class licensees interested in this traffic net are urged to contact Vic. LPJ continues to collect BPL cards and the XYL/OAI combination of KEB/KFV continues to break section traffic records. JOA received EAN Net certificate. MUM made DXCC. K2ABW added a new antenna to his 813. K2HID won a Viking Adventurer kit at the Fordham RC. OKU is going RTTY. K2ECN is completing a 300-watter. K2IYK dropped the "N." LGK uses a Williamson amplifier for a modulator. The Tu-Roro Club already is planning its Field Day in W3-Land. JGV is going mobile. OBU keeps his old rig going while hoping for a modern transmitter. EC and GP are kept busy with business, which explains their low traffic scores. KN2KMD is a new Novice at IJJ. K2DVT expects to invade 2 meters. K2AED is converting a 522. ENW and K2ESZ completed 813 rigs per Jan. '54 QST. ENW also has 10-meter mobile ready for spring mobiling. K2CMV built GDO and audio oscillator for test gear. JCA is rebuilding 813s and expects to move out on the Island in May. DSC is the proud possessor of a WAC certificate. KFV has completed Viking mobile and VFO. DLO has finished 220-Mc. transmitter and crystal-controlled converter for the same band. 5ZRA, GG's son and TUK's brother, is off to North Africa with the Air Force. RB has a new SX-88. CXI became the proud father of a baby boy. The Nassau 10-meter AREC Net had a successful hidden transmitter hunt with 12 mobiles and 4 fixed stations locating GPQ/KCW. K2HYK received 20-w.p.m. CP certificate. AEV visited ZS6-Land and EL2X. Ray is adding a 75A-3 to his shack. The Levittown RC started '55 with 20 new members and a brand-new 2.5-kw. generator. The VHF SS saw many new stations active. K2ED returns to the air with a Viking II and an HRO-50T. K2AMP is working on a new VFO. K2DDU now is a MARS member. UXY is returning to 144 Mc. IRTV/2 has modified the HT-6 on 75 meters. The Columbia U. station, AEE, is heard regularly in contests. CLG has a new Gonset 20-meter beam. TUK is completing the Signal Slicer for s.s.b. reception. FI reports that RACES activity in Nassau County is increasing. RDK has moved to W8-Land. K2DND, ex-8MUP, and 5MLR, now are heard on 144 Mc. GG has added crystal converter for 2 meters. Please continue mailing reports to TUK to avoid re-mailing by YBT. The percentage of reports for the last quarter of 1954 shows that many stations do not report as regularly as they might. Keep the reports coming! Traffic: (Jan.) W2KEB 1016, KFV 720, LPJ 584, VNJ 344, JOA 290, MUM 162, BO 129, AEE 125, K2ABW 69, W2JZX 67, K2HID 64, CRH 41, AMP 27, W2LGK 22, K2HYK 18, W2IN 16, JGV 14, GP 13, OBU 10, EC 5, IAG 5, TUK 3, K2AED 2, W2HJ 2. (Dec.) K2GXL 10, DDU 2.

**NORTHERN NEW JERSEY** — SCM, Lloyd H. Manamon, W2VQR — Asst. SCM: Charles Teeters, K2DHE. SEC: IIN, PAM: CCS. RMs: EAS, CGG, and NKD. A new club, The Raritan Bay Radio Amateurs, has been organized in the Raritan Bay Area. Officers are TTM, pres.; K2DDM, vice-pres.; K2BEV, secy.; SUT, treas.; and K2EQD, act. mgr. K2CHI has a new Viking II. K2AFQ is having receiver trouble. YVQ has a ground-plane antenna on 20 meters. EAS reports the Jersey Net is alternating NCS each night of the week. NIY has worked more than 1000 different Novice stations. EWZ now has 30 watts on 3.5 Mc. The Windblowers VHF Society is making plans for a visit to 1HDQ's shack and ARRL Headquarters. Many of the members expect to be on 420 Mc. and higher very shortly. JCO is QRL with school work. K2GAS is a new ORS. Dick ran up a fine score in the CD Party a few days after receiving his ORS certificate. The Ocean County Amateur Radio Assn., AFU, elected the following officers at a dinner meeting: Arthur C. Wilkes, pres.; Joseph Solante, secy.; and William Thorne, treas. After the election two films sponsored by Hallcrafters were presented on the screen, "Adventure in Africa" and "The SCR-299B." At a later meeting K2AT demonstrated (at his home at Princeton Junction) microwave transmissions, transistors, transmission of modulated light waves, and a solar battery in action. K2BAY has finished the new VFO and is back on the air only to find he has TVI. K2DSW needs four more states for his WAS on 40 meters. HNP is lending a hand with the RACES program in his home QTH. CVW was active in the CD Party. KN2HXP sends in his first report and says he has the Novice 807 rig as described in the *Handbook* all fired up on 40 meters and is having wonderful luck with it. Herm rolled up 1292 points in the Novice Roundup. You need not be an ARRL member to report your activities. We are pleased to hear from anyone. Anyone knowing the QTH of KN2JLQ, please pass it to the SCM. I am holding a KN6 QSL card for him. JKH is off the air until the new home is completed. KXD has a new addition to his family, a little boy. ZPD is doing a fine job with RACES in the Bloomfield Area. His monthly news letter, *The Signal*, distributed to all members of the Bloomfield Civil Defense and RACES members, is a very excellent way of keeping up interest in this activity. LQP reports Bergenfield well organized in the RACES program. The Irvington Radio Amateur Club held its annual banquet Feb. 21st at Townley's Restaurant in Union, N. J. K2ICE and asst. operator

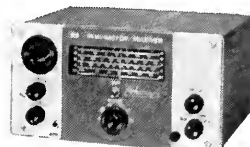
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# System Engineering

## IN *Harvey*-WELLS EQUIPMENT



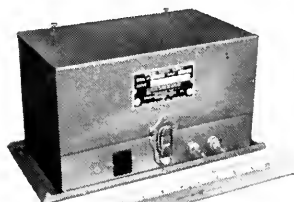
T-90 Bandmaster Transmitter



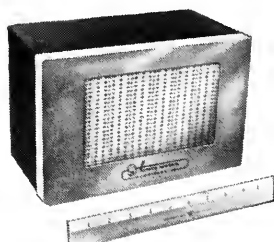
R-9 Bandmaster Receiver



APS-90 Power Supply  
1115 V. A.C.



VPS-T90  
Mobile Power Supply



Speaker for  
Fixed Station Operation



Speaker for  
Mobile Operation

Here at Harvey-Wells, we make communications systems for military and commercial applications, and we believe that Hams too, want their stations complete in every respect. That's the basic thinking behind this new equipment we are introducing.

The tremendous success of our TBS-50 Bandmaster has been due in part to the fact that it can be put on the air quickly and efficiently because it is a complete "package" with no additional equipment necessary.

Our new T-90 Bandmaster Transmitter is also a complete "package". It can be on the air five minutes after you bring it home if you so desire.

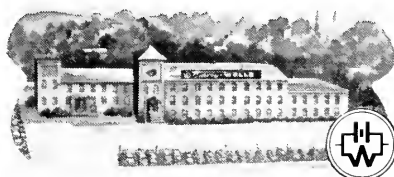
Just plug in the power supply and connect the antenna. Our new R-9 Bandmaster Receiver, in its matching case, becomes an integral part by simply connecting the antenna to the T-90.

For fixed station operation, we offer the APS-90 A.C. Power Supply in a cabinet to match. (Just connect to 115V A.C., plug the output cable in the rear of the T-90 and you are ready to go.)

The R-9 Bandmaster Receiver has a built-in A.C. supply. For mobile operation we have two vibrator power supplies, the VPS-T90 for the transmitter, and the VPS-R9 for the receiver. Both are convertible for 6 or 12 V operation.

Speakers for either fixed or mobile operation are matched electrically and physically to the R-9 Bandmaster Receiver to complete the system. This new Bandmaster Series is a complete system, engineered for fixed, mobile or portable operation — a system which has beauty as well as efficiency. It's well worth waiting for.

P.S. We are still making the world-famous TBS-50 too!



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A compact wide range VTVM-Ohmmeter for modern electronic circuit checking in the laboratory, on the production line and in the ham shack. Features include Peak-to-Peak voltage ranges which afford a new high in P-P reading accuracy of pulsed wave-forms in color or monochrome TV and similar applications.

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- ▶ 6 TRUE-ZERO-CENTER DC VOLT RANGES:  
Constant 25 $\frac{2}{3}$  Megs input resistance.  
0  $\pm$ 1.2  $\pm$ 6  $\pm$ 12  $\pm$ 60  $\pm$ 300  $\pm$ 1200 volts.
- ▶ 5 ELECTRONIC OHMMETER RANGES:  
0—1000—10,000 ohms. 0—1—100—1000 Megs.
- ▶ 6 PLUS and 6 MINUS DC VOLT RANGES:  
(Left-Hand-Zero) constant 13 $\frac{1}{3}$  Megohms input.  
0—1.2—6—12—60—300—1200V.
- ▶ 6 HIGH IMPEDANCE RMS AC VOLT RANGES:  
0—1.2—6—12—60—300—1200 volts
- ▶ 6 HIGH IMPEDANCE P-P AC VOLT RANGES:  
0—3.2—16—32—160—800—3200 volts.
- ▶ 5 SPECIAL HIGH FREQUENCY PROBE RANGES:  
0—1.2—6—12—60—300 volts RMS.  
(Requires optional PRECISION RF-10A HF Probe).
- ONE UNIVERSAL COAX. AC-DC VTVM PROBE serves all functions other than HF ranges.
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- EXTRA-LARGE 5 $\frac{1}{4}$ " RUGGED PACE METER.  
200  $\mu$ A sensitivity  $\pm$ 2% accuracy.
- 1% MULTIPLIERS and SHUNTS.

MODEL 88: complete with detachable AC line cord, internal ohmmeter battery, coaxial VTVM Probe and operating manual. Size: 5 $\frac{1}{2}$  x 7 x 3 $\frac{1}{8}$ ". ... \$69.75 net

#### ACCESSORIES FOR THE MODEL 88

RF-10A HF vacuum tube probe..... \$14.40 net  
TV-8 60 Kilovolt safety probe..... 14.75 net  
ST-1 Snap-on foldaway tilt-stand..... 1.00 net

**PRECISION Apparatus Co. Inc.**

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Canada: Atlas Radio Corp., Ltd., 560 King St., W., Toronto, 28

Annie are off to Florida for a holiday. Lou has the Communicator with him so no doubt will talk his way to Florida and back. A big sale is in progress at the shack of K2DHE. LIR is going strong on s.s.b. His influence on HJL might produce another sideband station in the Belmar Area. SWL Tony Sexton has purchased a new National receiver and a Viking II transmitter. NIE has a new 75A-3 receiver. Traffic: W2CQB 194, EAS 111, K2GAS 97, W2FPM 24, K2DSW 21, GFX 14, GER 13, W2CVW 12, CJX 4, N1Y 3, K2CHI 2, BAY 1.

#### MIDWEST DIVISION

**IOWA** — SCM, William G. Davis, W0PP — This is my biggest month for reports since I've been SCM. Twenty-two reported. BDR and SCA are running neck and neck with PZO and CZ on the way up in traffic. HWY, PAN, and PKT are new members of TLCN. KJV is a new ORS. TLCN worked NWX/M/3 while he was driving downtown in Philadelphia. UBY dropped the "N" and is working all bands. FKA and his XYL vacationed in Florida. QQA built up a Globe Scout. QJF has a Viking II. QWN has a Globe Scout on order. NGS has a new 32V-3. WN0ZQA and WN0ZAN are new Novices in Des Moines. MKT reports excellent results with his Viking Ranger. SFK is busy with a new power supply for his 813. PAN is all set for traffic. MG was reelected president of the Waterloo Club. TQI is about ready to drop the "N" from his call. New officers of the Ft. Dodge Club are JOL, pres.; QVZ, vice-pres., and treas.; NGS, secy.; NCV, YUA, and LAR, directors. JAD and KJV sent along nice letters with their reports. Thanks a lot, fellows. Please get your appointments in for renewal, fellows. These will be the last I will be privileged to endorse. Traffic: W0BDR 2140, SCA 1703, PZO 532, CZ 181, LJW 76, QVA 52, NGS 46, EHH 32, LFZ 28, MKT 24, BLH 22, RMC 20, LGG 19, KJV 17, SFK 14, HWU 11, SWD 8, PAN 2, NYX 1.

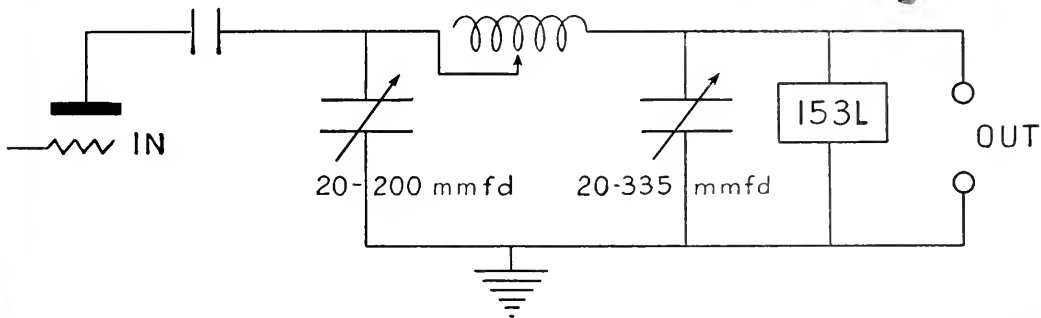
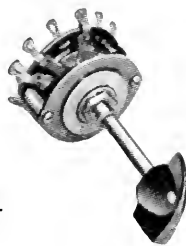
**KANSAS** — SCM, Earl N. Johnston, W0VCW — SEC: PAH. PAM: FNS. RM: N1Y. The Kansas 75-Meter 'Phone Net came to action from 2 P.M. to 10 P.M. Feb. 4th because of heavy snow and icing conditions in the State. ONF, TNA, and WXT acted as net controls. Those known to have participated were BLI, BYV, ECD, ERA, EBB, EBL, FIHU, FHT, HF, IWS, IYF, ITF, KXB, KAJ, LIX, OZK, PBU, QMU, RLZ, MI, MNJ, JFR, LOW, YOS, DSY, SKW, UPB, VSC, NAS/MI, NPS, TDW, OMM, OPQ, ONC, TYR, VRZ, EUZ, RC, REP, SQX, DSY, and UTL. The Kaw Valley Radio Club of Topeka participated in the Cerebral Palsy Telethon which was telecast over WIBW-TV for 18 hours. Using CET, with WGM's equipment as base station on the stage and eight mobiles, several thousand pick-ups of contributions were made. Those participating were UPU, KSY, IMH, EUU, AFD, BD, JLY, KKF, QJC, AGC, OZF, W5MFC/0, and ICV. 31SH/0 and YUII are new 2-meter stations in KC. A new e.d. net is operating in KC on 145.5 Mc. MOX has completed the 125-watt rig for 6 and 2 meters and is starting on a 220-Mc. rig. A new club is being organized in Manhattan, according to NFX. LBJ needs only New Hampshire to complete WAS on 160 meters. UGA is at Camp Carson, Colo. PHV is a new active station in Perry. REP is a new OPS. We regret to report FYG, of KCK, as a Silent Key. He was killed in a holdup of the YMCA where he worked. KVRC of Topeka is sending code practice on 1815 kc. Mon.—Fri. 1930 to 2030. Traffic: W0BLI 455, OHJ 231, N1Y 195, UAT 131, FSE 116, EOT 61, TOL 55, FEO 49, ABJ 44, KSY 36, NFX 34, VBQ 30, TNA 27, FNS 24, REP 24, LBJ 23, FDJ 16, YJU 15, FVD 14, IFR 14, RB0 14, YFE 14, RBO 13, ICV 12, ECD 11, SAF 8, BET 4, DEL 4, KFS 4, QMU 4, LIX 1.

**MISSOURI** — SCM, Clarence L. Arundale, W0GBJ — SEC: VRF. PAM: BVL. RMs: OUD and XQO. The Suburban Radio Club, Inc. elected BUD, pres.; ZIO, vice-pres.; AKS, secy.; and PMU, treas. The St. Louis U. Radio Club elected ETW, pres.; TCF, vice-pres.; WKI, secy.; WKG, treas. The Club has purchased an HRO-50 for its station. NGX, of Lebanon, was killed in a recent tragic highway accident. The EXFs are vacationing in KH6-Land. OMM received her RCC and WAS certificates and is going all-band mobile with a new Gonset. DFK has worked 7 states with 15 watts on 2 meters. GCL has the 813 rig rebuilt and on the air. RCV is teaching code to prospective Novices. VFP has a new Heathkit VFO. CFL received his 2500 Traffickers Club certificate and GAR his 10,000 certificate. EBE received an A-1 certificate. SUV has a new 40-watt antenna. SAK's 12-year-old brother now is WN0ZOL. RTO burned out his modulation transformer. QBX has a new Viking VFO. New certificates have been issued to CFL, ECE, GAR, MFB, OIV, OMM, RTO, RTW, SUV, Tsz, TWL, VFP, VPG, and WAP. MON is operating a 7:00 A.M. schedule on 3580 kc. MIE/N moved its schedule up to 6:00 P.M. on 3900 kc. because of skip conditions. Appointments: DFK and NRX as Ecs, SUV as OBS, ECE and SAK as ORSs. The Show-Me Net has moved from 40 meters to 3580 kc. because of skip conditions, and meets at 4:00 P.M. Sun. 3MJA, chief operator at K0FBO, is the proud father of an 8-b. daughter. Traffic: (Jan.) W0CPI 970, GAR 770, K0FBO 385, W0BVL 300, GBJ 280, OMM 100, RTO 92, SAK 74, CKQ 65, WAP 62, VPG 61, OUD

(Continued on page 94)

# MALLORY HAM BULLETIN

## Pi Coupling Networks are easy to make with Mallory 153L Decade Switch



Whenever an amateur designer tackles the job of putting together a "Pi" antenna coupling network, he runs into the problem of getting a wide capacitance tuning range on the antenna side of the circuit.

The usual method of assembling a decade group of 10 mica fixed capacitors and a selector switch is not nearly as simple as it sounds. First, it requires 10 capacitors... which take a lot of space. And second, getting these units arranged into a compact, short-lead pattern is far from easy.

Here is what radio experimenters at Mallory did to lick the problem. Instead of 10-unit decades, they built a capacitor decade with only four capacitors... by using a Mallory Type 153L Switch. Type MC 500 volt mica capacitors, with values of 100, 200, 300 and 400 mmfd. are connected to the switch in the recommended manner. As the switch is rotated, the capacitors are automatically connected in single and parallel arrangements to provide ten steps of 100 mmfd. each, plus an "off" position. If you're not familiar with the 153L Switch, you can find a description in any late Mallory Distributor Catalog.

Placing a variable capacitor, with a range of

about 20 to 235 mmfd. in parallel with the decade switch provides an output circuit with a smoothly adjustable range from 20 to 1335 mmfd. This circuit, as set up by Mallory amateurs, gives good matching from most low power final amplifier stages into a wide range of antenna feeds. It will be smoothest when working from plate impedances of the order of 3000 to 5000 ohms into a 50 ohm co-ax fed antenna system. As drawn here, the circuit will work well on all bands from 3.5 through 28 megacycles.

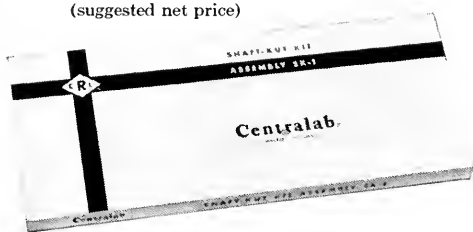
The inductor  $L_1$  must be made adjustable over a range from 20 to 2 or 3 microhenries, depending on the frequency band and on the particular plate and antenna impedances. Representative values will be found in the Radio Amateur's Handbook and in magazine articles on "Pi" network operation.

Your Mallory distributor will be glad to show you one of these versatile Capacitor Decade Switches, as well as the many other Mallory electronic components that you can rely upon to keep your rig in top-notch operation. Stop in and see him soon, and put this idea to work for yourself, too!

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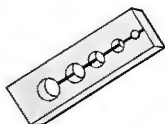
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**\$2.50**  
 (suggested net price)



**New Tool Kit simplifies cutting of control and switch shafts**

## Centralab Shaft-Kut Kit

These tools are especially handy when you have to cut off a shaft, adapt a shaft and knob type, or pry out the slot in a Centralab "R"-type Front Fastatch Dual Control. Here's what you get:



1. Custom-made, hardened carbon-steel, shaft clamp that holds any shaft in a vise, firmly and without damage.



2. Fine-tooth, high-speed black saw blade that has extra-fine teeth (32 per inch) for a clean cut.



3. Precision, half-round, needle file that is narrow enough to get inside the tubular outer shaft of a dual concentric.



4. "A"-size drill that is just the right size to drill out those few special plastic knobs so that they fit the inner shaft of a CRL Fastatch dual.



5. AK-16 drill stop that limits the depth of cut to the exact dimension required.



6. Small screwdriver that you can use to adjust set-screw knobs, and to do many other jobs.

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60, HUI 45, IJS 36, EBE 32, TSZ 27, SUV 24, KA 22, QXO 21, RTW 18, QBX 11, W9LHB/0 10, W0KIK 10, TCF 8, TGG 6, DFK 5, BUL 4, MFB 4, QMF 4, OIV 2, TWL 2, ECE 1. (Dec.) W0OMP 203, QBX 10.

**NEBRASKA** — SCM, Floyd B. Campbell, W0CBH — Asst. SCM: Tom Boydston, 0VYX. SEC: JDJ, PAM: EUT, RMs: HTA and RDN. RHL has p.p. 4-250A home-brewed rig. BZS has a new YL around the shack. ERM has PR 807-VFO with 813 in the building stage. RDN contacted 56 sections, 326 QSOs for 90,000 points in the CD Party. WN0WLO worked 44 sections, 135 contacts, 37 states for 6600 points and earned his 15-w.p.m. certificate in the Novice Contest. The Wheat Belt Radio Club is in operation with territory in Northwest Kansas and Southwest Nebraska. FVD is secretary. New officers of the North Platte Amateur Radio Club are QGV, pres.; VYX, vice-pres.; ERM, secy.-treas. KXD (mobile), LRK, (mobile), and CBH (operating fixed control station) recently aided the marchers in securing dimes. RNH has 46 states and rang up 60,000 points in the SS Contest. RNH is a member of the Nebr. C.W. Net, Nebr. Phone Net, TEN, and United Trunk Lines Daily AIN is using cubical quad. PHW received the grand prize awarded by the Ak-Sar-Ben Club for his outstanding contribution to amateur radio. IOS got his final QSL for WAS on 20 meters. IJK has a new YL around the shack. ATU is using 250THs s.s.b. FQB received a BPL medallion. UOW retired the 348 for a better receiver. Traffic: K0AIR 1874, W0ZJF 130, RNH 107, FQB 82, AEM 53, HTA 48, FXH 45, FTQ 43, MAO 32, VYX 26, OFL 22, PDJ 21, ERM 18, EGQ 17, DQN 15, BEA 12, QHG 12, K0FBD 10, W0ORW 10, UJH 10, CBH 9, GVA 9, PUT 9, OOX 7, PZH 7, NHS 5, PPT 5, QOU 5, WN0VZI 5, W0BOQ 4, EFV 4, THX 4, UJI 4, VKY 4, K0WBF 4, W0AGP 3, CIH 3, DDP 3, OXA 3, IAY 2, KLB 2, LXF 2, POL 2, IRW 1, NIK 1.

## NEW ENGLAND DIVISION

**CONNECTICUT** — SCM, Milton E. Chaffee, W1EFW — SEC: LKF, PAM: LWV. RM: KYQ, MCN and CN 3640, CPN 3880, CTN 3640 Sun., CEN 29,580 kc. Although all nets show a dip in traffic totals, CN passed 177 for 6.8 average per session. KYQ, RGB, and LV rated QNI honors again. CTN, meeting at 9 a.m. Sun., rates a look by all who are interested in trying their hand at slow-speed traffic and it's good for phone men who want to bone up, too! MCN averaged 5 messages per session clearing 127 for the month. IBE, YYM, and RGB scored high in QNI. ORS renewals went to KYQ and TD; EC renewals to TCW, HDQ, and OAX; YU renewed OBS and OPS; URC and HDQ renewed OES. GVJ is a new OPS from Massachusetts and WKW is a new OES. CPN proves traffic moves on 3880 kc. by reporting 97 cleared with QNI honors to DAV, LWV, KGT, and VWL. WNH is struggling with 5 watts to a "rinky-dink" antenna but still snared KV4AA on 80 meters. AOS reports on his troubles with his private power plant. WHL says he is having fun running a flea power phone on 75 meters. New officers of the SARC are URC, pres.; Royak, vice-pres.; Hopkins, secy.; BGP, secy.; TCW, comm. officer, with ZTY and Novice BHZ as stewards. BRM plans an active part in AREC at Hartford. A nice monthly bulletin from MRA is published by WRO. BYB and GIX furnished OO reports. RWD is active in RACES Area 2. HYF is now a handy man so is less active on the air. EJH, new Bridgeport EC, reports a new club, BARES, for AREC work, with IM, EJH, EOD, DJL, NKR, NQY, JVQ, RLD, SXR, YPV, and WZV starting off. BDI is overhauling 144-Mc. gear. CHX reports a new Novice in West Hartford is WN1DKK, the father of ZCR. CUH has a new 200-watt rig with 813 final. HDQ reports c.d. is all set at Canton. UJG reports new Hamden ARA officers are DDP, pres.; WIS, vice-pres.; QXT, secy.; FKQ, treas.; and AYC, act. mgr. RAN has donned a uniform by now. URC has all home-made 144-Mc. gear. BGP says many in his area were active in the V.H.F. SS. BSE now has General Class ticket and upped power to 150 watts. JTD has the new 375-watt rig ready to go. EFW visited the HCARA Feb. 3rd. DTX is a new call in Meriden. Traffic: (Jan.) W1YBH 199, AW 120, NJM 103, YYM 86, CUH 85, LV 77, EFW 75, LIQ 66, KYQ 65, HUM 51, RGB 49, RRE 47, RFJ 37, QJM 30, BDI 26, HYF 26, ZDX 19, EDA 18, EJH 15, UED 15, KV 14, WHL 14, WNH 13, YU 13, EOB 10, GIX 8, NEK 8, BVB 4. (Dec.) WJNJM 75, FTM 15, WFM 15. (Nov.) WFTM 13. (Oct.) W1YNC 2.

**MAINE** — SCM, Bernard Seamon, W1AFT — The Pine Tree Net meets Mon., Wed., and Fri. on 3595 kc. at 7 p.m. the Barnyard Net Mon. through Sat. on 3960 kc. at 8 a.m. the Sea Gull Net Mon. through Fri. on 3940 kc. at 5 p.m. The Maine C.D. Drill is held each Sun. on 3993 kc. at 11 a.m. The Bangor Radio Club put its mobiles to work under the direction of QJA during the Mother's March On Polio and gave a big boost to the "March of Dimes." There is a new OM in Dixfield and his call is YVN. The Maine gang has had considerable success in contacting LHA on his cruise through the Southern Waters aboard the Maine Maritime Training Vessel. ZFH is being congratulated on the arrival of a new harmonic, a YYL. TBZ reports that his jr. operator, Roger, who is attending

(Continued on page 96)

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**D103T • DeLux 10m 3-El. T match, \$25.95.** 1—8' Boom, 1" Alum. Tubing; 3—6' Center Elements, 1" Alum. Tubing; 6—6' End Inserts, 3/8" Alum. Tubing; 1—T Match (4'). Polystyrene Tubing; 1—Beam Mount.

**S104T • Std. 10m 4-El. T match, \$24.95.** 1—12' Boom, 1" Alum. Tubing; 4—6' Center Elements, 3/8" Alum. Tubing; 8—6' End Inserts, 3/8" Alum. Tubing; 1—T Match (4'). Polystyrene Tubing; 1—Beam Mount.

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**D153T • DeLux 15m 3-El. T match, \$39.95.** 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 2—5' End Inserts, 3/8" Alum. Tubing; 2—6' End Inserts, 3/8" Alum. Tubing; 2—7' End Inserts, 3/8" Alum. Tubing; 1—T Match (6'). Polystyrene Tubing; 1—Beam Mount.

## 20 M. BEAMS

**S202N • Std. 20m 2-El. (No T), \$21.95.** 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/8" Alum. Tubing; 1—Beam Mount.

**S202T • Std. 20m 2-El. T match, \$24.95.** 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/8" Alum. Tubing; 1—T Match (8'). Polystyrene Tubing; 1—Beam Mount.

**D202N • DeLux 20m 2-El. (No T), \$31.95.** 2—12' Booms, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/8" Alum. Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

**D202T • DeLux 20m 2-El. T match, \$34.95.** 2—12' Booms, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, 3/8" Alum. Tubing; 1—T Match (8'). Polystyrene Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

**S203N • Std. 20m 3-El. (No T), \$34.95.** 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/8" Alum. Tubing; 1—Beam Mount.

**S203T • Std. 20m 3-El. T match, \$37.95.** 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/8" Alum. Tubing; 1—T Match (8'). Polystyrene Tubing; 1—Beam Mount.

**D203N • DeLux 20m 3-El. (No T), \$46.95.** 2—12' Booms, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/8" Alum. Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

**D203T • DeLux 20m 3-El. T match, \$49.95.** 2—12' Booms, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts, 3/8" Alum. Tubing; 1—T Match (8'). Polystyrene Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

Southern Tech. in Atlanta, Ga., has a brand-new ticket with the call CIS. That makes Frosty's family 100 per cent ham as his XYL is UQT. Greetings to a new operator in Augusta, ZAK. Cony High School, of Augusta, has organized a radio club. Our own WTG is the "Veep." Incidentally, Charlie suggests that the Maine gang sponsor a Maine QSO Party and also a WAM certificate. For the third time the amateurs of Maine are asking the Maine Legislature to issue distinctive license plates to them in recognition of their service to the citizens of the Pine Tree State. Traffic: W1WTG 97, UDD 42, LKP 37, LYR 35, YVW 20, ZBN 12, TWR 11, BX 10, EFR 9, AFT 8, BTY 8, FD 8, YTE 8, ZME 6, BZF 3, WRZ 1.

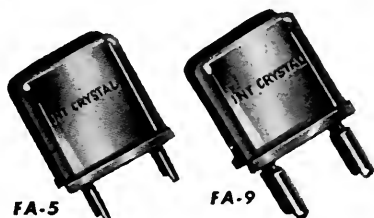
**EASTERN MASSACHUSETTS—SCM.** Frank L. Baker, jr., W1ALP—New appointments: NCO Acton, QKY Canton, ZVX chairman of the Area 1 Radio Comm., as EPCs; ABJ as OPS; EPE as RM for 20-160-meter c.w. band and PAM for 160-meter 'phone. Appointments endorsed: ORA Wakefield, KTG Cambridge, MRQ Groveland, TRC Maynard, as EPCs; LMU, QHC, and TNK as OBSS; LAMU and AOG as OBSS; UIR, AVY, and WSN as OOS; MRQ, AQE, AOG, and TY as OBSS; TNK and MRQ as OPSS; AQE as RM for 40-meter c.w. BJA is moving to Schenectady. LZW is on 40-meter 'phone, UIR is mobile. Heard on 2 meters: ODQ, DLY, DPN, RME, NVB, ABJ, CHN, DQF, WEW, DRP, AAI, DCJ, AQR, and K2CBD. New Novices are DQF, BB's XYL, and DRP. UOC's XYL, W1NDOM is Sonny Hayes in Quincy. K17PDG, ex-IPDG, now is living in No. Reading. ALP had a meeting at OLP's for the new towns in Area 1 Sector B with NFQ and CLF. A 2-meter frequency of 147.3 Mc has been assigned. The IPN has moved to 3970 kc. WSN has 500 watts on 20 meters. Sorry to have to report the death of KJZ, WHC has gear for 1215 and 432 Mc. AJZ has a 32V-2. VTX has a new 10-meter converter. YPT and YXJ are coming back to Cape Cod. BCN is on 3615-3912 kc. MFI is conducting a radio and code class in Hyannis. TJW has a rotating 75-meter dipole antenna. CLF is active on 15 meters. HIL built side-band slicer for HRO-60. The Cape Cod and Island Net has formed an organization which meets Mon. through Sat. from 0745 to 0915 on 3912 kc. It was started by SGL. AQE worked HK0AI on 40 meters. CTW is active on 15-meter c.w. The T-9 Radio Club met at HMC's and has perfected a Black box antenna 6x6x3! CAM is in EXIN. DOF participated in the January CD 'Phone Party on 75 meters. The Arlington Radio Club elected KNW, pres.; WYC, vice-pres.; THO, secy-treas. Radio Amateur Open House has changed its meeting night to Wed. at Cambridge YMCA, reports TON. KJO gave the Club a talk on Transistors. BSY gave a talk at the Wellesley ARS on Antennas. The South Shore Club had a talk by SX on S.S.B. and OOP spoke on VFOs. The Braintree Radio Club had TQQ demonstrate a Gonset Communicator on 2 meters and Mr. Lucas, wire inspector, gave a talk. DDH, a new ham in Reading, has TBS50-D. VFO NC-125 receiver. ABJ is on 4 bands. CLF has an SCR BC-211 frequency meter. KEK, Lynnfield EC, says they have the call DKH. ISU, Holbrook EC, has FED and JXM helping him. YYL is handling public relations for the Seacoast Ham Club. The annual meeting was held at RZZ's. Officers are WCL, pres.; AFE, secy.; YVB, treas. ALP attended a meeting of the Norfolk County Radio Assn. at NOV's. NCO, Acton EC, has TRD, YPW, MFI, BPA, and QEY signed up in the AREC. DVS, Falmouth ARX secretary, writes that the Club took part in the ARRL DX Contest. TJW, our EC, has made QLT and DVS his assistants. QLT will be Mobile Marine on the *Albatross*, mainly on 21 Mc. SUE and KCL are Mobile Marine on the *R.V. Bear* in the Caribbean. DJK has high power on 2 meters. The Wellesley Club held an auction with PTY, ZZO, and GGM. AZY and SSS have new HQ-140X receivers. WNI's DIR and DIY are on 80-meter c.w. UIE is 100 per cent s.s.b. UID repairs meters. QJR is on 20-meter c.w. ZPE has a new speech clipper for the Viking II. AVY has an Eldico automatic keyer with monitor. The Braintree Radio Club has received the call DUO for its station in the library, with TYN at the police station. OMU is putting up a long wire. LMU is rebuilding for 2 meters. QKA will be on 2 meters. UH has a new 20-meter beam. Newton has some new Motorola FM 2-meter rigs. EK is going to crystal converter for 2 meters. LVN is making trips to VP9-Land. On the last Winthrop C.D. drill HJF, DEL, BDU, CMW, DJ, OIR, MQB, NMX, BOX, DQF, DPN, DLY, DGV, DRP, TTH, and BB were on. 48TM is at Fort Devens and has a Viking Ranger transmitter on the air. Sorry to have to report the death of Helen Wright, 1UPN. Traffic: (Jan.) WIEMG 393, UOQ 238, EPE 99, WSN 95, IBE 40, LM 22, NUP 19, TY 17, AVY 16, MKW 14, CLF 12, AOG 10, BY 8, HIL 7, WU 6, IA 5, CTR 4, TYN 4. (Dec.) W1NUP 19.

**WESTERN MASSACHUSETTS—NOTICE TO WESTERN MASSACHUSETTS ARRL MEMBERS:** In view of finding that a technical lapse in his FCC license status had inadvertently occurred (confusion with June '53 date of Extra Class endorsement on same) Art Zayarella, W1MNG, asked Hq. to find his SCM nomination invalid. This left Mr. Osborne R. McKeraghan, W1HRV, in the running as the only eligible nominee and he has therefore been certified as SCM for the current term. SCM, Osborne R. McKeraghan, (Continued on page 38)

## Notes on the "Robert Dollar" Oscillator

Considerable use is being made of the circuit shown in figure 1 for overtone use. Redrawn as in figure 2 this circuit appears as a basic Pierce Oscillator where  $R_2$  is plate load. Capacitor  $C_2$  may be considered a blocking capacitor, while  $C_1$  is the plate capacitor providing capacitive reactance as required in the Pierce Oscillator.

This, for the moment, neglects the tuned circuit L-C. Such a situation occurs when L-C is detuned from the overtone crystal frequency. When the oscillator is placed in operation under these conditions Crystal  $Y_1$  oscillates, as in any Pierce Oscillator, on its fundamental mode. Output will be obtained from the circuit and drive indicated to succeeding stages. However, the crystal will be operating on its fundamental.



Spot Frequencies  
for Amateurs  
and Experimenters

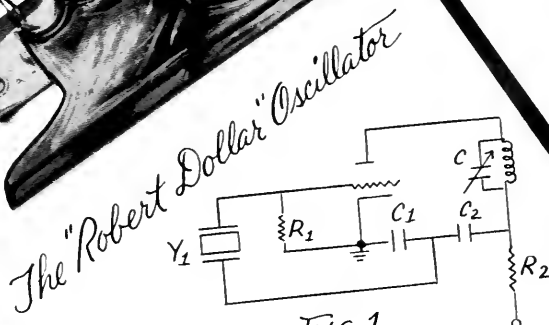


FIG. 1

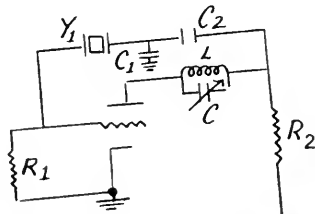


FIG. 2

## ONE-DAY PROCESSING

### Spot Frequencies 2000 KC to 75 MC

**.01 % TOLERANCE**—Crystals are all of the plated, hermetically sealed type and calibrated to .01% or better of the specified frequency. See specifications below:

For close tolerance and commercial applications use the F-6 series crystal. Write for full information).

### SPECIFICATIONS

**Holders:** Metal, hermetically sealed, available in .093 dia. pins (FA-9) or .050 dia. pins (FA-5).

**Calibration Tolerance:**  $\pm .01\%$  of nominal at  $30^\circ \text{C}$ .

**Temperature Range:**  $-40^\circ \text{C}$  to  $+70^\circ \text{C}$ .

**Tolerance over temperature range** from frequency of  $30^\circ \text{C} \pm .01\%$ .

**Circuit:** Designed to operate into a load capacitance of 32 mmf on the fundamental between 2000 KC and 15 MC. Designed to operate at anti-resonance on overtone modes into a grid circuit without additional capacitance load. Write for recommended circuits).

Orders for less than five crystals will be processed and shipped in **one working day**.

**HOW TO ORDER**—In order to give the fastest possible services, crystals are sold direct. However, crystals are also available by special order through your local jobber. Where cash accompanies the order, International will prepay the Airmail postage; otherwise shipment will be made C.O.D.

### PRICES

FA-9\* (Pin Diameter .093)\*

FA-5 (Pin Diameter .050)

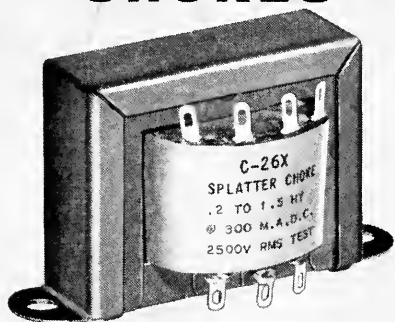
Pin Spacing .486 (\*FA-9 fits same socket as FT-243)

RANGE	TOLERANCE	PRICE	
Fundamental Crystals		FA-9	FA-5
2000-9999 KC	.01%	\$2.80	\$2.70
10000-15000 KC	.01%	\$3.90	\$3.80
Overtone Crystals			
(for 3rd overtone operation)			
15 MC—29.99 MC	.01%	\$2.80	\$2.70
30 MC—54 MC	.01%	\$3.90	\$3.80
(for 5th overtone operation)			
55 MC—75 MC	.01%	\$4.50	\$4.40

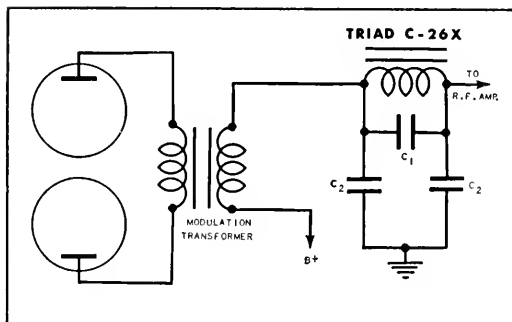
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Typical Circuit for Mobile Operation

### C-26X SPLATTER CHOKES

List Price \$5.65

0.2h to 1.5h @ 100 ma.

H	W	D	MW
1-15/16	3-1/4	2-1/8	2-13/16



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WIHRV. Send station and club news to 22 Mutter St., Easthampton, Mass., please. In building up our section organization and activities we ask your cooperation and reports, please, right after the first of each month. MNG summarizes all our January activities and announcements; this will be our task next time. The WM c.w. Net meets on 3560 kc. Mon. through Sat. at 1900 EST. WM Phone Net will require overhaul for survival. SSBand activity in No. Adams has engaged MKJ, MJD, and ZEO, who ran 10 milliwatts peak on 75 meters at 8 p.m. QWJ has been logging QSOs with I7, ON, IIB9, and Gs on 3810 kc. in early-evening using mechanical filter in home-brewed rig and Q-Multiplier in the receiver. EC endorses: LLN, IIRV, SPE, RLV, COI, ORS: HRV, LLN, UVI, TVJ's absence from the traffic column is caused by heavy school skeds and diligent OObserveing; 21 notices to stations mostly outside of WM, ULE and ULF have changed their QTH to Connecticut. An active YL is YCU, Judy of SatEvPost fame, who now makes her traffic debut as manager of the College Net. Along with top traffic honors, UKR has taken on the job of national radio chairman for the Powder Puff Derby terminating at Barnes Field, Westfield, July 2nd through 7th. Eunice is lining up help for this event which should give WM amateurs a firecracker field day on 75, 20, and 2 meters. The Hampden County Club is in the act. LJQ, TAY, and ex-QFB are instructing code for Northampton c.d. EVZ is communications officer for the newly-established C.D. Area 4, all of WM except Worcester County (Area 3). COI is itching to fire up his rhombics. Active in the January CD Party were ABC, AMI, BKG, JYH, MNG, MVE, and WEF. BVR has a new Viking II and improved signal. VSR was heard on 75 meters. FKN checks into VNH — managed the 2-meter Connecticut Valley Roundup (145.3 Mc. at 2000 EST, Thurs.). Some 40 WM stations took part in the January V.I.F. SS. Included were 31 Hampden County stations which rolled up almost 20,000 points. Traffic: WIUKR 254, MNG 74, BVR 68, SRM 62, IIRV 53, KIWA 48, WIAMI 26, TAY 25, WEF 24, DVW 13, YCU 13, ABD 9, HRC 8, HNE 6, JYH 4, BH 3, UVI 3, NY 2, AVK 1, LLN 1, MJD 1, YCG 1.

**NEW HAMPSHIRE** — SCM, Harold J. Preble, WIHS — SEC: BXU, RM: CRW, PAM: AXL, AIJ has taken over NCS for the Merrimack County Emergency Net and is using a new Viking II complete with Matchbox, VFO, and SX-99. This net meets Tue. at 1830 on 28.6 Mc. IP has been appointed ORS and is getting a kick out of handling traffic again. YHI has a new jr. operator named Garry, born Jan. 2, 1955. YFZ has enlisted in the Air Force. TWP has completed his kw. and is doing an FB job with it. CNR, a new addition to Portsmouth RC, has been appointed Asst. Radio Officer for Portsmouth C.D. YMJ is busy building lobster traps. JWJ, YFZ's dad, still is doing a terrific job of teaching code classes. The Portsmouth C.D. Net meets on 29.560 Mc. Thurs. at 1900. ARR has a new electronic key. SSK is busy at present with hi fi. Rockingham County EN, phone section, meets Sun. at 1230 on 3850 kc. Rockingham County stations, please call in. WBM recently took a trip to New Jersey and reports lots of activity on 2 meters in New York City and New Jersey, using his Gonset Communicator II. Let's continue to the following Novices: CRC, CSE, CSW, CUE, CUI, CUL, CWN, and DCB. Traffic: WICOC 51, IP 43, ARR 40, HS 34, CCE 30, POK 9, WBM 9, CDX 6, FZ 5, VZS 2, YHI 2.

**RHODE ISLAND** — SCM, Walter B. Hanson, jr., WIKKR — SEC: TQW, RM: BTW, PAM: VXC. The NCRRC installed the following new officers and celebrated at Stone Bridge Inn: ODZ, pres.; TXF, vice-pres.; AJR, treas.; ZUL, rec. secy.; YAO, corr. secy. JFF and TRX report the Newport County Emergency Net now is on 29.536 kc. 4CVO/1 appeared on the Honor Roll of frequency measuring stations for 1954, and is grinding crystals for Novices on 40 meters. KCS notes ever-increasing section activity in V.I.F. Contests and aurora openings for these who are patient. CDV has left for Navy duty from March to November. A new club has been formed in Woonsocket with the call DDD. The Blackstone Valley Amateur Radio Club has started with a bang and has its state charter. The Club has a summer club house plus winter quarters at Stone House Club and was given a two-page spread in the local Sunday paper. The officers are IIIW, pres.; ZEZ, vice-pres.; DPA, secy.; DOR, corr. secy.; DQR, treas.; AUT, act. mgr. The BVARC meets every Fri. at 8:00 p.m. Your SCM happily reports a new high in station activity reports this month. Keep them coming. Traffic: WICDV 114, UTA 60, YKQ 32, BTW 31, ZXA 17, BXX 16, W4CVO-1 13, W1VXC 8.

(Continued on page 100)

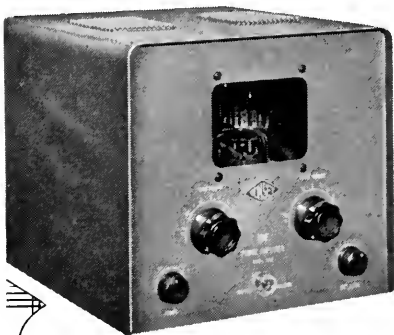
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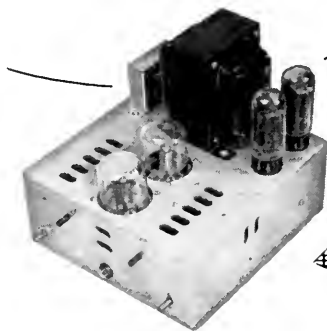
*quickly... simply... economically*

THE 2 METER LINEAR RF POWER AMPLIFIER...a new member of the Gonset Communicator family...provides carrier power output of 50-60 watts...when driven by a Communicator.

Patch to existing Communicator in less than a minute, no alterations required. Switching Communicator to transmit automatically activates the amplifier...including antenna change-over relay.

Gonset has "Engineered out" tricky adjustments. Fool-proof, easy tune up requires only observance of amplifier panel indicator in conjunction with conventional set-up of driving Communicator.

Amplifier uses push-pull 826 VHF triodes with forced air cooling. Power supply utilizes two, 5U4GB rectifiers in a husky, voltage doubling power supply circuit. Cabinet matches, (style and size) that of Communicators, looks (and operates) well with other 2 meter equipment.



#3063 ..... Net 149.50  
Complete with tubes,

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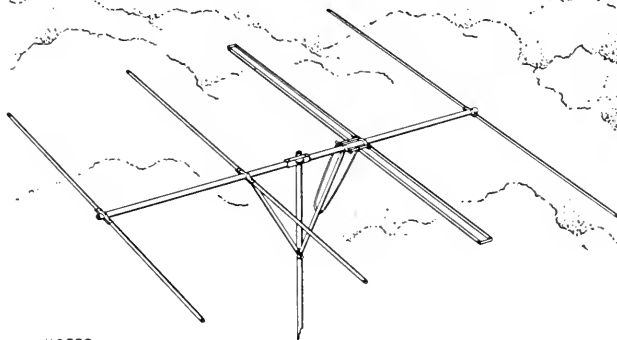
Designed essentially to complete the new Gonset 6 meter Communicator package, the excellent characteristics of this new beam render it well suited for general 6 meter use.

Consists of four elements, reflector, folded dipole and two directors; the array being largely pre-assembled thus simplifying field erection.

A balun is provided for balanced feed and correct match of 52 ohm unbalanced coax lines to symmetrical folded dipole with low VSWR.

Forward gain is approximately 10 db. (Half wave dipole reference.) Front-to-back ratio about 20 db.

A NEW 6 METER YAGI



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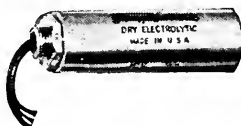


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200 ohms D.C. resistance choke.  
2 1/4" wide, 2" high, 2 3/8"  
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15 H. 50 Ma..... **49¢**

## LIMITED QUANTITY

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Coax angle plug..... **.45**  
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110V. relay, DPST 20 Amp contacts..... **3.95**



Triple 8 mfd. 450 V. electro-  
lytic upright can condenser,  
separate negatives, all leads  
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net \$2.58..... **ONLY**  
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For break-in operation on CW, AM, or  
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moving parts, no power needed to  
operate. Coax fitting for connections to  
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With 75 meter plug-in coil... **\$9.95**  
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Triple 8 mfd. 500 working volt D.C. oil-filled  
condenser, common negative, solder termi-  
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## FOURTH VERMONT QSO PARTY

The Tri-County Amateur Radio Club of Brattleboro, Vermont, announces the 4th Vermont (QSO) Party and invites all radio amateurs to participate. Vermonters are urged to work as many out-of-state stations as possible, so that interested amateurs can earn credit toward WAS, WANE and W-VT awards. Here are the details:

(1) Time: 24-hour week-end period from 6 p.m. EST Saturday, April 9, to 6 p.m. Sunday, April 10, 1955.

(2) No time limit and no power restrictions.

(3) Scoring: *Vermont stations*: 1 point per contact and multiply total by the number of states, U. S. Possessions, Canadian provinces and foreign countries worked during the contest period. *Outside stations*: 5 points for each Vermont station worked and multiply total by the number of counties in Vermont worked during the contest period.

(4) Credit for contacts with the same station on another band will be given this year, in order to promote more activity on the higher bands.

(5) A certificate will be awarded to the highest-scoring station in each state, U. S. Possession, Canadian province and foreign country, and to the highest-scoring station in each Vermont county. In addition, a W-VT certificate will be sent to any station working 13 of Vermont's 14 counties, provided the station has not previously been issued this award. Party logs showing required data will be accepted in lieu of QSLs.

(6) Watch 3520, 3740, 3860, 7050, 7250, 14,100, 14,250, 21,000, 28,100 and 28,800 kc. for contest stations. Stations are urged to spread out to keep QRM down and to allow our low-powered stations to be heard.

(7) General Call: "CQ VT." Vermont c.w. stations should identify themselves by signing *de VT (call)* K. Phones say, "Vermont calling."

(8) Contact information required: Vermont stations send number of QSO, RST or RS and county. All others send number of QSO, RST or RS report, and state, possession, province or country.

(9) Logs and scores must be postmarked not later than May 10, 1955, and should be sent to Tri-County Amateur Radio Club, c/o Ray N. Flood, W1FPS, 2 Marlboro Ave., Brattleboro, Vt.

VERMONT — SCM, Robert L. Scott, W1RNA — SEC: SIO. PAM: RPR. RM: OAK. The Brattleboro TCARC announces a Vt. QSO Party to be held Apr. 9th and 10th. Rules, etc., follow this report. The Burlington ARC states it will operate KOO/1 c.w. and phone in Grand Isle County during the QSO. The BARC voted to co-sponsor with the Montreal ARC the 4th Annual International FD at Bay-side (near Burlington) June 12th and also is working on the idea of combining the Vermont Hamfest with the FD. GAE is building a kw. rig, RPR a kw. final, and GAZ a kw. final. SEL is wintering in Florida and AXN is in Texas. BARC's new officers are VEB, pres.; WPK, vice-pres.; VSA, treas.; and NLO, secy. We understand QQN has an antenna for 75 meters now! FPS *still* is using a flit gun. WPY, VSA, VEB, and TBG are working 220 and 420 Mc. Traffic: W1RNA 140, OAK 78, AYP 60, IT 46, QEW 38, BJP 30, BNV 28.

## NORTHWESTERN DIVISION

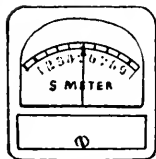
ALASKA — SCM, Dave A. Fulton, KL7AGU — It appears that it soon will be hamfest time again and the date for the Alaska Amateur Radio Convention has been set for July 22, 23, and 24. It will be somewhere in the Anchorage Area and just as soon as we get the details will pass them on. AWB reports several good openings on 21-Mc. c.w. to the East Coast, also AWB reports lack of W interest in working KL7s in the C.D. Contests. Ws and VEs just don't seem interested, or is it the weak signal? We would like to know the answer to that one ourselves, Joe. It might be why more KL7s aren't on. DG is holding radio classes in Kodiak and there should be some newcomers soon from that island city. AGU finally has the mobile installed in the new vehicle and should be heard more often on 75-meter mobile. It should be about time to get the mobile tuned up. How about it, fellow?

IDAHIO — SCM, Alan K. Ross, W7WU — Ririe: LQU reports WNs WEX, WEY, and WEZ, at Menan, are now Conditional Class. Pocatello: QIS writes from Treasure Island that he is returning to his home in Pocatello. He spent most of his Navy enlistment in KHH-Land. Lewiston: IDZ reports a pot-luck dinner was held by the club. UJA won a receiver kit and OOW a multimeter. RGZ is building a crystal converter for 75 meters. Kellogg: RQG is trying

(Continued on page 102)



## A good microphone can improve your results as much as a high gain antenna



Ever notice that two signals of the same "S meter" intensity sound differently? One is muddy, dull, a little hard to read—the sibilant letters like S and F almost alike. The other signal is sharp, clean and readable even in QRM and QRN—because there's usable intelligence. No mistake about the call or comments.

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Shown above are a few of the E-V microphones designed for effective communications. Amateur discount applies.

(upper left) Model 611 high output dynamic and Model 911 crystal. On-Off switch. List from \$25.50 to \$37.50

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(lower left) Model 630 wide range, high output dynamic, with exclusive Acoustalloy diaphragm. On-Off switch. List, \$47.00

(center) Model 636 "Slimair" wide range dynamic. Pop-proof head. Acoustalloy diaphragm. On-Off switch optional. List, \$70.00

(lower right) Model 623 slim-type high output dynamic, with E-V Acoustalloy diaphragm. On-Off switch. List, \$49.50. Also Model 926 crystal, less switch and connector. List, \$24.50

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(Actual Size)

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## TEMPERATURE CONTROL OVENS

Small, compact, light, uniform, to complete the environmental control picture. A wide variety available.



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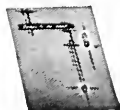
## MILITARY TYPES

Hermetic sealed, metal cased, in frequency ranges from 16 kc to 100 mc.



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for 2-meter activity with himself and HXN already on. Emmett: TYG reports on the newly-formed Emmett Valley Radio club. Boise. Officers of the Gem State Amateur Radio Club are GHT, pres.; PKA, vice-pres.; and IWU, secy.-treas. JMH is back with us but still is using 0RSG/7. ALY also is back with us from a spell at San Francisco. OZJ moved to Caldwell. MKS reports Idaho RACES is awaiting approval. Traffic: W7RSP 52, NVO 4.

**OREGON** — SCM, John M. Carroll, W7BUS — HUI has resigned as net director for the Cascade Net and is being transferred to a post in the Army in the Far East. QWE and QJC turned in a perfect score for check-ins on the Cascade Net. The Cascade Net picked up contributions called in to KOIN on a March of Dimes program. A transmitter was set up in the studio on 29.3 Mc, and contacted the mobiles from there. HAZ is new president of the Powder River Camera Club. UAR and UAV are at EOSC at La-Grande. OWI is new president of the Baker Amateur Radio Club. QEI is active in MARS. AHP resigned as EC for Grants Pass and NTF was nominated as his replacement. SBT is active on 2 meters. WKA is working for his Conditional Class ticket. Skip conditions have made attendance in OSN difficult. The OARS has almost finished building the club house. VZD has a new QTH in Oklahoma. VBK is new president of the Southern Oregon Radio Club. VBII is new president of the PARC. SZS is becoming active on MARS. AEF has a new business QTH in Portland. This month marks the end of my two-year term and it has been a pleasure to be SCM for Oregon. ESJ will take over from here and please give him the fine cooperation I have received. Traffic: (Jan.) W7APF 957, QKU 222, VIL 111, TBT 49, AJN 32, BLN 32, WAT 30, QEI 28, ESJ 19, HDN 19, PRA 6. (Dec.) W7WAT 518.

**WASHINGTON** — SCM, Victor S. Gish, W7FIX — Your new Section Emergency Coordinator is RCM, of Vancouver, Wash. The North Seattle Amateur Radio Club elected JPH, pres.; WAM, vice-pres.; WAO, secy.; UZK, sgt. at arms, QH and FTX, trustees. Other trustees are CO, OEX, LWB, and PGY. VAX is on 3970 kc. at 0700 PST Tue. through Sat. for traffic. KUS is QRL trying to get the Fort Lewis station on the air. OE is traveling with new Adventurer for portable. AIB is playing around with the page 24 Feb. QST antenna-coupling systems. EHH is on ALN, FARM, WARTS, and Montana. Phone nets. KG-BDF/7 is having antenna trouble—the guy next door dropped a tree across it! The Skagit Emergency Net meets on 50 Mc. 8 to 10 A.M. Sat. GAT says "Conds!!!!" TGO is working 80-meter DX between studies. LVB has no regular skeds but takes traffic for anywhere. ZU still is keeping the Sun. 20-meter sked with PRZ at Cornell U. HDT hopes to get back on WARTS soon and reports UJA is on with a new 180-watt 4E27 rig. YPD, ex-6PZC, is building a new 813 final. CZY has little time for anything but MARS nets. JEY reports the MTN C.W. Net closed down because of conditions. Richland News from UQY: YFO is on 40 meters with 813 and ground-plane antenna; GWD, NLI, and UQY tested out equipment for the DX Contest; UBJ was heard chasing 40-meter DX with 150 watts and a new Vibroplex; PKP and VXE are on both e.w. and 'phone and PKP also is mobile. BA reports that he will be in KH6-Land for a month; JNC is on with a vertical—working across the fence; PGY has his RTTY copying; CBE RTTY copies and sends; TMO is working a KH6 with a Ranger; WAM made Gen. Cl.; PHO still is working on the cool, cool kw; OZG has a kw. on the air with a vertical. HMQ reports from Puyallup that EIJJ is on 75 meters; GJU has a new QTH in Olympia; HMQ is on 2 meters; LEC sends code lessons on 10 meters; MCU now is RTTY; MTX is buying mobile gear; OEB checks into all the nets he can find; VLC is NCS of the Novice Net; WHV made 173 contacts in 41 sections in the Novice Roundup; SWA and his XYL, WMX, are sharing a Globe Scout. The Radio Club of Tacoma elected RNS, pres.; RGD, vice-pres.; UYL, secy.; UIN, treas.; RGD, pub. (also Tacoma EC). The Apple City Radio Club is building a communications van for e.d. work. PVF is looking for a 6-ft. relay rack—he checked in on the WSN 1988 Net the next day after inquiry about nets. Traffic: (Jan.) W7BA 1740, PGY 1085, VAX 658, FRU 570, KUS 90, APS 38, UYL 33, EHH 30, USO 29, WEY 27, UZB 23, FTX 20, K6BDF/7 14, W7OE 14, AIB 13, FWD 11, KT 10, PQT 10, RX II 9, GAT 6, TGO 6, LVB 5, ZU 5, AMC 4, YPD 4, EYF 2. (Dec.) W7FRU 1522, KT 94.

## PACIFIC DIVISION

**HAWAII** — SCM, Samuel H. Lewbel, KH6AED — Many thanks to the gang for the honor of election as your SCM. The varied services "of, by, and for" ARRL members and amateurs are to be built up through appointment. There is a need for OOs, OBSS, the formation of an AREC, and traffic and net activity reports. In reporting use P. O. Box 3564, Honolulu. I expect to visit our neighbor Islands shortly, when possible on club meeting nights. Civil defense net activity is to be reported. Send all news prior to the seventh of each month. V.h.f. activity in Hilo and Honolulu has raised interest in this field. The gang is preparing for long-haul tests between Oahu and Hawaii. Attend all club meetings possible. Monthly reports are welcome! Traffic:

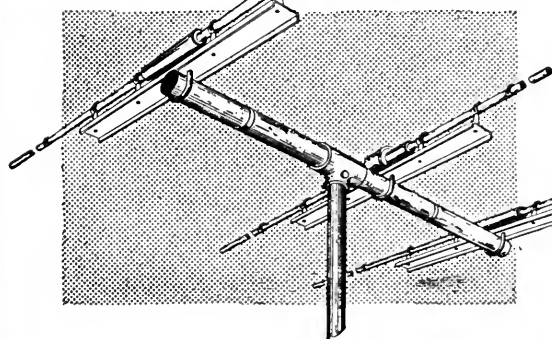
(Continued on page 104)



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### 15 Meter, 2 Element Shortbeam

6 ft. boom. Forward gain 4.4 db over full size reference dipole. Front to back ratio 15 db. Tuned 21,350 Kc. Approximate wt. 15 lbs. Longest element 13 feet.

MODEL R.S. 2-15  
AMATEUR NET

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### 15 Meter, 3 Element Shortbeam

12 ft. boom. Forward gain 4.8 db over full size reference dipole. Front to back ratio 20 db. Tuned 21,350 Kc. Weight approximately 20 lbs. Longest element 13 feet.

MODEL R.S. 3-15  
AMATEUR NET

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12 ft. boom. Forward gain 4.4 db over full size reference dipole. Front to back ratio 15 db. Tuned 7250 Kc. Weight approximately 30 lbs. Longest element 33 feet.

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NEVADA — SCM, Ray T. Warner, W7JU — ECs: PEW, PRM, TVF, TJJ, and ZT. OPSS: JUO and UPS. ORSS: MVP, PEW, and VIU. OBS: BVZ. Nevada State frequencies: Phone — 3880 and 7268 kc. C.w. — 3660 and 7110. WVQ recently was elected presy of the Southern Nevada Amateur Radio Club. RKE left Boulder City for the Dakotas. WTR heads the TVI Committee in Las Vegas. WN7YNO is the son of VIU in Elko. VIU worked Japan on 80-meter c.w. WN7YNE is an XYL in Henderson. YJB is active in Henderson. WN7YEX is active in Winnemucca. SKU has returned to Nevada and is now on 40-meter c.w. from Sparks. Welcome back, Neil, QGE, of Sparks, is on with a Viking Ranger and SX-71 showing interest in MARS activities. PEW, Elko EC, expects to show an increase in daytime activities now that he is on a graveyard shift.

SANTA CLARA VALLEY — SCM, R. Paul Tibbs, W6WGO — EXN is QRL installing mobile in his new car and is rebuilding gear for low frequency. AIT is reporting in on NCN and RN6 for traffic. K6BBD is sporting a new Viking Ranger and reports that Santa Clara High School has organized a radio club. YHAM says the new HQ-140X sure brings in the signals. Don is looking for an insulator to take the base of the new vertical antenna. K6BBF has a new Gonset 144-Mc. rig using it to work fixed and mobile. K6BAM has been heard on s.s.b. of late with an FB signal. 4YIP/6, at Moffett Field, is a good outlet for overseas traffic. MMG reports officers of the North Peninsula Electronics Club are MMG, pres.; K6EMN, vice-pres.; LPS, secy.-treas.; QIE, act. mgr.; and NVD, QIE, and MMG, CCRC representatives. The Club meets the 3rd Fri. of each month. DPE is on the air with a new 803 final. WLI worked in the last CD Contest. FON reports in with traffic. KN6-EMO was active in the Novice Roundup and says that it was a thrill to work his first DX, JA1AEA. FTI is back on the air after a long period of inactivity, working on 14 Mc. mostly. CFK is coming back on the air with s.s.b. using Central Electronics exciter 20-A. IIC still is looking for you who are interested in traffic to check into NCN on 3635 kc. at 2015 nightly. There is need for New Mexico and Arizona stations to report into RN6 to handle traffic for those states. Let's fill these spots and plug up the holes in the coverage of these nets. Traffic: W4YIP/6 502, W6YHM 351, HC 95, K6BBD 71, W6FON 60, UTW 48, AIT 11, K6BAM 11, BBF 10, W6MAG 10, EXN 6.

EAST BAY — SCM, Guy Black, W6RLB — Asst. SCMs: Oliver A. Nelson, Jr., 6MXQ, for v.h.f.; and Harry T. Cameron, 6RVC, for TVI. RMs: IPW and JOH. PAM: LL. ECs: CAN, CX, FLT, QDE, TCU, ZZF, and K6ERR. New officers of the Richmond Radio Club are K6BYD, pres.; ACM, vice-pres.; IRJ, secy.; K6AYM, treas.; WXB, sgt. at arms; TWI, EFD, PAV, and EJA, board of directors; and K6CUH, TWI, ACM, and EJA, delegates to the CCRC meetings. In addition, TWI and EFD are on the TVI committee, PAV is the publicity chairman and K6DMI is program committee chairman. It's really swell of IJR to send in a complete rundown on the Club, and I wish other club secretaries would do as well. IRJ and FZC have been checking into the Central California Civil Defense Net (CCDN) Mon. at 7:30 p.m. 3501 kc. VPC reports for the Southern California RTTY Society that the following have just received Model 26 machines: KHW, FZC, CBF, RLB, NCQ, JNY, FSL, NEQ, MCU, and K6DCA. A recent visitor to the Bay Area was GNL6LS. NBS is building a new mobile rig. OHQ and WGM are new East Bay Radio Club delegates to CCRC. The EBRC heard a fine talk on traveling wave tubes by EXN and CQG. KHW and LBJ are now part of the Club's TVI committee, with 0HTG as chairman. K6ERR has a net for the Berkeley-Albany-El Cerrito AREC at 7:30 p.m. Thurs., 145.69 Mc. The SARO 144.27-Mc. Net is very active. The Oakland Radio Club has a fine project — an oldtime radio shack as a museum piece, to be located in the Oakland Red Cross building. Donations of old-time equipment are being solicited. GMB is building a new VFO. KN6GOY is building a 15-meter rig. K6IGN, at Richmond Union High School, is shared by ten operators. PAV has a 44-ft. vertical. KFU is a new assistant communications chief for civil defense in Richmond. K6DMI is taking care of mobile activities for civil defense. EJA is publishing a club paper for the Richmond Club, *The QRM'er*. ITH is spending a lot of time around Waikiki. K6CCQ is interested in 420 Mc. BXE is putting out Official Bulletins at 7 a.m. Mon., Wed., and Fri. for the early birds. Listen at 3870 kc. also at 7 p.m. on Mon., Wed., and Sat., same frequency. TI reports 175 foreign contacts and 36 countries with his new 7-Mc. ground plane in just three weeks. TMX expects to be active on Guam with a peanut power rig and HRO. Traffic: (Jan.) K6WAY 558, FDG 511, GK 146, W6IPW 115, EJA 13, YDI 3, HBF 1, (Dec.) K6WAY 353, W6ITH 17, K6CCQ 12.

SAN FRANCISCO — SCM, Walter A. Buckley, W6GGC — SEC: NL. The S.F. Radio Club enjoyed the movie "The Atom Goes to Sea" and also, through the courtesy of ELW, the slides "50 Years of Amateur Radio" by Bruce Kelley, 2ICE. Approximately 200 members attended the January Special. The 29ers transmitter hunt for the month

(Continued on page 100)

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was put on by SY and BIP. The HAMS once again has changed its meeting night; starting in February the Club meets the 3rd Fri. night of each month. HAMS (Oakland Red Cross group) participated in the local disaster drill. Oakland supposedly was hit by a strong earthquake and all local branches of the Red Cross came to her aid. With Admiral Cooke in charge all the bay area cities attended a meeting at the local Jewish Community Center in San Francisco and gave a report on activity. The amateur group of Red Cross Communications put on a demonstration of how they worked in time of disaster. Five mobiles checked in with net control at center, stated what equipment they were using and their location. NL acted as outside net control and BYS acted in charge at the Community Center. Evidently the demonstration made quite an impression on the group. The point was brought up that amateurs could contact other amateurs in disaster places and obtain all the information needed before the Red Cross Survey Department could even reach the stricken city. The HAMS use the 2-meter band for c.d.-Red Cross work and the Club was congratulated on how well organized it is. YLRCSF, the ladies' radio group of San Francisco, celebrated its first birthday by holding a dinner for members and their families. CEE, Vada Letcher, president of the National Ladies' Radio Clubs, came up from Santa Monica to join in the celebration. The Mobiles had 14 members take a trip to Yosemite Valley. They had such a good time they decided to make Yosemite Motorcade a yearly affair hereafter. Three San Francisco amateurs died within a short time of each other, PA, YZL and JLS. Condolences to their families. KN6HIW has a new Harvey Wells transmitter. KN6JDK built a transmitter and now is ready to go on the air. KN6IKQ is the proud owner of a Viking II. PCN is busy trying to get news for the San Francisco Club paper. Congratulations to SWP and GQY on January BPL totals. QMO reports that she is active on c.w. YC is active on 40- and 80-meter c.w. CBE was busy preparing the rig for the DX Contest. ACN reports that approximately 2000 more ham plates have been issued since the 6040 list came out in June. License plate bills, Senate Bill No. 222 and Assembly Bill No. 593, already have been introduced at the current legislature session. Local amateurs are looking forward to the ARRL Pacific Division Convention coming up May 21-22 at Fresno. Many plan to attend. JZ, Pacific Division Director, fell and broke a couple of ribs. We wish Ray a speedy recovery. Congratulations to three new Novices, KN6JMM, KN6JMN, and KN6JKA. Traffic: (Jan.) W6SWP 663, GQY 533, QMO 203, YC 12, GGC 10, PHT 5. (Dec.) W6GQY 390.

**SACRAMENTO VALLEY** — SCM, Harold L. Lucero, W6JDN — The Golden Empire Amateur Radio Club is moving to the Engineering Bldg., Chico State College. The Shasta County Amateur Radio Club elected new officers Feb. 7th. The c.d. radio officers for Carmichael Calif., TYC, KKI, IQF, and UM are really doing a fine job. Congratulations. Our RMI has resigned. Who will fill Harvey's shoes? Any takers? Harvey, I want to thank you for your aid during your stay as RMI in the section. I only hope that you will return and give us further aid and I want you to know that your work was really appreciated by the entire section. Luck to you in your undertakings and 73 from us all. The Sacramento Council of Amateur Radio Clubs will make three awards: (1) For the year's Outstanding Amateur. (2) A merit award. (3) Certificate of Achievement. CIS reports he is QRL work but he makes c.d. drills. KN6JIG is new in Chico. PYE and SIA are still arguing over who has the best beam. FXO is playing with s.s.b. OEY, president of the Tehama County Amateur Radio Club, is expected on soon. LSB keeps a weekly sked with K6GVB, 100 miles on 144 Mc. with a 2500-ft. mountain between. New amateurs on the engineering staff of KBET-TV are QAQ, CVV, LEY; QEU is chief engineer. K6ER reported QRM from an Armed Forces station on 14,090 kc. K6ASX, in the northern part of the section, has ORS, OPS, EC, and OBS appointments. Jon's a junior in high school and skipped the Junior Prom to be in the DX Contest. The Dunsmuir Club is coming into its own and hopes to have a hamfest this summer. Well, fellows, in starting a new two-year term I hope with your cooperation it will be as pleasant as in the past. Traffic: W6MWR 20, CIS 8.

**SAN JOAQUIN VALLEY** — SCM, Edward L. Bewley, W6GIW — SEC: EBL, RMI: K6BGM. PAMs: ZRJ and WJF. The Sonora Club is getting started and already has a 250-watt Kaar transmitter at the Office of Civil Defense. PCB is secretary and the Club is building seven portable rigs for 2 and 10 meters, designed by CQI. EBL is kept busy every Sun. morning as NCS on the Central Valley Round Table at 1100 on 3900 kc. We have word that ZRJ and K6BGM moved to San Jose Mar. 1st. Doc and Ann have boosted lots of club and traffic activity in the section and we will miss them. K6EVM will replace Ann as RMI. WPV is getting on s.s.b. soon and is giving 2 meters a work-out. NTV anticipates about 500 watts on 2 meters with a pair of 4-125As. He already has the final. Sandy is proud of his new SX-96 receiver. The Stockton Club presented a television program on KTVU, demonstrating amateur radio. It was a wonderful job of public relations and thanks go to ZNL, QUE, and KN6HWT. EXH sends code nightly on 144.8 Mc. at 1830, 5 to 13 w.p.m. IAZ has bought a home at

(Continued on page 106)

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Seacliff, JDC and LMA are active from their new QTH in Oakdale. VKR is working in Hawthorne. SJJ is building a 500-watt final. SNF is getting started in c.w. traffic with 60 watts to an 807. K6EVM is building a VFO for 40 meters. GRO is kept busy as proxy of the Am. Legion Net. JJE is putting out an FB signal from Lemoore on 2 meters. LOS moved from Stockton to Bakersfield. HXJ and KN6EEV moved to Stockton from San Francisco. Traffic: W6ZJR 459, FEA 171, ADB 119, GRO 116, K6BGM 55, EVM 28, W6SJJ 25, EBL 9, SNF 6.

**ROANOKE DIVISION**

**NORTH CAROLINA**—SCM, Charles H. Brydges, W4WXX—SEC: ZG, PAM: ONM, RM: VHH, PIC, in Greensboro, is a new ORS. CBP is working on a new pair of 812s and will be on soon. YPY has been doing fine business with his 813s but has a little TV trouble. TLA and WXX were in the 'phone section of the CD Party and BDU and VHH were in the c.w. section. MDA worked 24 stations in the V.H.F. Contest on 2 meters and made a real fine score, high score in the State. REW got his 37th state toward mobile WAS by working 1BCR in Rhode Island. Bill still needs Delaware before working on the western states. The Charlotte C.D. Net sounds very good on Sunday afternoons. There are about 35 stations on roll with about 20 checking in every week. DBQ is moving to Florida. AJW is expanding to 20 and 40 meters. During January CVX worked 18 new countries on 20 meters. His DX total now is 41—not bad for just getting on the band. There are several new stations on 2 meters in the Charlotte Area. VHH got Moresville with his 15 watts. DLX also is on 2 meters and TYR is building up stuff to get on. WXX received WAS and will be on with p.p. 813s soon. Not as many monthly reports were received as per usual this month. Let's have those reports next month and fill our column. Traffic: W4WXX 244, BUA 2, CVX 2, EJP 2.

**SOUTH CAROLINA**—SCM, T. Hunter Wood, W4ANK—BAN has moved to a new QTH and needs only Nevada for WAS. Congratulations to HDR on making BPL on 'phone. According to SCM records he is the first to have this honor in South Carolina. RPV reports a club is being organized in the Sumter/Shaw Area. LXX now is ORS and made a score of 95 in the CD Contest, saying that his antenna would not bring in the signals and he hopes to do better next time. FGX is making alterations in his rig and soon will be back on the air. ZRH was on 3700 kc. for 16 hours and 15 minutes during January sending Official Bulletins and code practice nightly at 7 p.m. The Charleston Club, HHO, has ordered a complete Viking emergency station with receiver and emergency power supplies. AUL reports that with the advent of TSU on mobile he has 5 mobiles on 75 meters in his EC net with two more prospects. The South Carolina C.W. Net, under RM AKC, meets nightly Mon. through Fri. on 3525 kc. at 7 p.m. The South Carolina 'Phone Net, under PAM FFH, meets at 7:30 p.m. Mon. through Fri. and at 0830 and 1530 Sun. The president of each South Carolina club is being appointed Asst. SCM to form a group to act on joint matters. The SCM should be contacted for this appointment. Traffic: W4HDR 378, AKC 213, FFH 108, ZIZ 108, RPV 26, ANK 23, YNR 3.

**VIRGINIA**—SCM, John Carl Morgan, W4KX—Hughes Motley, RTV, the new SEC, will be looking for volunteers for EC appointments in many areas. If you're interested, drop him a card. UBC succeeds sea-duty-bound LW as publisher of the *Virginia Bulletin*. LW, in Europe in January, sent a card from Germany. New arrivals include YL K4BUN, ex-K17AZL. Departures are LPP, now in Texas; BMX, gone to KP4-Land; and 3WDP, of K4MC, headed overseas. KFC reports visitors included 0NWXX, ex-NNN, KVM/VO6, and F0SAJ. Vic worked YV and ZL on 160 meters. The Central Valley ARC is conducting classes for some 25 prospective hams in the Staunton-Waynesboro Area. NRO reports the W.&M. ARC is in the doldrums. NQV won the senior championship in the international model plane meet in Miami in January. IF and YVG are bemoaning skip snafuings VN and VFN, but IF reports DXers QNing VN included ex-VNer 6CIW/KP4. Reported on s.s.b. in Virginia: FJ, IMP, IYC, JLV, JUR, MK, KMU, SPE, and VWS. JHI says since he and JFV are the only v.h.f.ers in the Roanoke Area, it's a lesson in patience waiting for "openings." CGE finally got an antenna that gets him beyond Norfolk City limits. Who says power is mandatory on 160 meters? BYZ got an OO QSL from Massachusetts as the result of VFO leak-through on 160 while he was on 80 meters. Pappy and jr., YE/YZC got a new 183D to go with the new all-band half-bucketful. EBII has ordered a new V-37 all-band vertical. KAO is back in business with a new Ranger. UBC's XYL is beavering away for her ticket. Thirteen-year-old EZB passed the General Class exam. PXA is VN Net manager. All appointees are requested to note appointment expiration dates and send certificates to the SCM for endorsement during the month previous to the expiration date. RJW was silenced during the transfer of his hard-working mobile gear to a new chariot. Traffic: W4PFC 1241, K4MC 136, W4TFZ 122, BLR 45, KFC 44, CFV 37, YKB 36, YZC 34, KX 28, IF 26, YVG 25, TYC

(Continued on page 110)

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# TELREX

## "BEAMED POWER" ARRAYS

**PRE-TUNED,  
MATCHED AND  
CALIBRATED!**

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YOU CAN BE SURE of optimum performance per element at your site with the highest S/N ratio, F/B ratio and minimum interference (TVI, BCI and QRM) pattern ever provided or available before.

### TWENTY METER ARRAYS

#502	2-Element Array	"T" Transformers	97.00	AMATEUR NET
#503	3-Element Array	and	120.00	
#504A	4-Element Array (Boom Struts furnished)	1/2 wave	185.00	
#505A	5-Element Array (Boom Struts furnished)	Coaxial "Baluns"	240.00	
#506A	6-Element Array (Boom Struts furnished)	included	280.00	

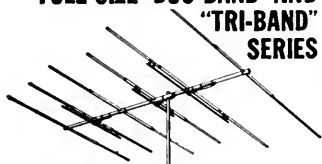
### FIFTEEN METER ARRAYS

#153A	3-Element Array	"T" Transformers	110.00	AMATEUR NET
#155A	5-Element Array	and 1/2 wave	210.00	
#156A	6-Element Array	Coaxial "Baluns" included	235.00	

### TEN METER ARRAYS

10M-3	3-Element Array	"T" Transformers	67.50	AMATEUR NET
10M-5	5-Element Array	and 1/2 wave	108.00	
10M-6A	6-Element Array	Coaxial "Baluns" included	145.00	

### FULL SIZE "DUO-BAND" AND "TRI-BAND" SERIES



**MODEL DB-10/11 Am. Net 118.50**  
Full Size 10-11 Meter on one boom. 3-el. on 10; 2-el. on 11. Wt. 30 lbs. Turning Radius 11 1/2 ft.

**MODEL DB-10/15 Am. Net 179.50**  
Full Size 10-15 Meter on one boom. 3-el. on 10; 3-el. on 15. Wt. 60 lbs. Turning Radius 15 ft.

**MODEL TB-3 Amat. Net 248.00**  
Full Size 10-15-20 Meter on one boom. 2-el. on 10; 2-el. on 15; 2-el. on 20. Wt. 86 lbs. Turning Radius 19 1/2 ft.

**MODEL DB-15/20 Am. Net 250.00**  
Full Size 15-20 Meter on one boom. 3-el. on 15; 3-el. on 20. Wt. 72 lbs. Turning Radius 22 ft.

### 40 METER ROTARIES

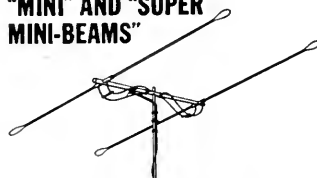


**MODEL 403 Amateur Net 330.00**  
3-element Full Size (100% Aperture). Wt. approx. 92 lbs. Turning Radius 35 1/2 ft.

**MODEL 402 Amateur Net 275.00**  
2-element Full Size (100% Aperture). Wt. approx. 60 lbs. Turning Radius 33 ft.

**MODEL 420 Amateur Net 180.00**  
2-Element "Mini-Beam" (64% Aperture). Wt. approx. 44 lbs. Turning Radius 17 1/2 ft.

### "MINI" AND "SUPER MINI-BEAMS"



**MODEL 520B Amat. Net 62.50**  
2-Element 20-Meter "Super Mini-Beam" (82% Aperture). Wt. approx. 14 lbs. Turn. Rad. 12 1/2 ft.

**MODEL 530B Amat. Net 92.00**  
3-Element 20-Meter "Super Mini-Beam" (82% Aperture). Wt. approx. 25 lbs. Turn. Rad. 15 ft.

**MODEL 1520 Amateur Net 55.50**  
2-Element 15-Meter "Super Mini-Beam" (86% Aperture). Wt. approx. 12 lbs. Turn. Rad. 9 1/2 ft.

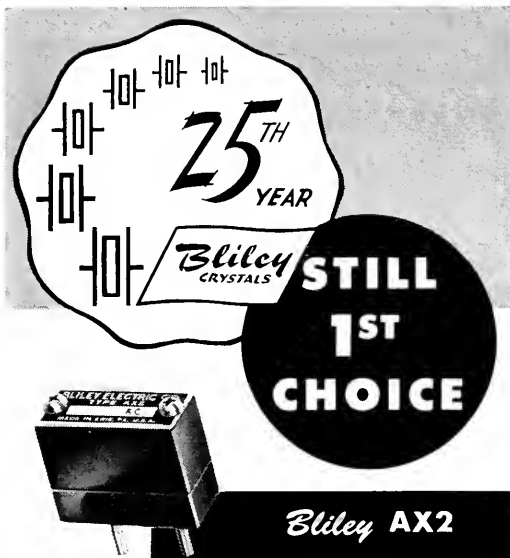
**MODEL TBM-3 Amat. Net 190.00**  
Tri-Band "Super Mini-Beam" 10-15-20 Meter on one boom. 2-el. on 10; 2-el. on 15; 2-el. on 20. Wt. 47 lbs. Turn. Rad. 15 1/2 ft.

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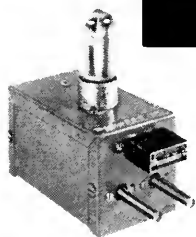
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RANGE	PRICE
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7000 kc - 7425 kc	\$2.95
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Now available for your amateur rig, a completely packaged oscillator unit designed and engineered to utilize the many advantages of crystal control on two and six meters. Output is obtained directly on six meters; operation on two meters requires only a tripler stage.

CCO-2L Output: 48 to 54 mc; Dimensions:  $2\frac{1}{4}'' \times 2\frac{1}{4}'' \times 4''$ ; Price: \$11.95 less tube and crystal (8-9 mc).



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13, JAU 12, CGE 11, WYC 9, AVO 8, IA 8, OWV 8, YE 7, BYZ 4, WBC 4.

**WEST VIRGINIA** — SCM, Albert H. Hix, W8PQQ — SEC: YPR, RMs: GBF, HZA, DFC, and JWX. PAMs: FGL and GCZ. Congratulations to NCS on being awarded the special citation by General Electric in its Edison Radio Amateur Award program for his work during the Richwood Flood. HZA has officially accepted the position of acting as net manager for the c.w. net. KCN has a new Viking Ranger. EMG has the mobile rig working very well now. RRD has a new Viking II and new antenna. GCZ is a new PAM. SHG is well on the way toward completing WAS on 40 meters. IEQ is NCS of the 50-Mc. Emergency Net in Huntington. Active members of the net are LSJ, FUM, GQJ, EZR, HRU, AHF, LBN, and club station KEF. The frequencies are 50.72 and 50.8 Mc. IYG has his kw. rig working very well. FUM is QRL getting things set up for its AREC-RACES Net. The hobby show in Morgantown provided lots of traffic for the nets. FMU has a pair of 813s about ready to go. BKL is plugging away at his 144-Mc. schedules very successfully and is building a converter for that band. MBA is very QRL school. The MARA continues to be a very active club. RKV is the new president of the Tri-City Club. Thanks for the excellent cooperation this month in submitting activities information. Traffic: W8JWX 232, GEP 118, HZA 99, IXG 81, ETF 29, FUM 16, NYH 14, IYG 10, FMU 9, MBA 8, KDQ 7, PQQ 6, QWU 3, RRD 3.

### ROCKY MOUNTAIN DIVISION

**COLORADO** — SCM, Karl Brueggeman, W0CDX — SEC: MMT, RMs: KQD and KHQ, PAM: IUF, K0WBB, W6PKL/8, W0CYT, EKQ, BEN, KHQ, and KQD now hold TCC appointments. Our Colorado Slow Speed Net is going real well, with an average session attendance of about 6. TVI won the fur-lined soup dish for a perfect attendance record. Remember, the Net meets Mon., Wed., and Fri. on 3570 kc. at 1715 MST. KQD received her BPL medallion. It is the only one in Colorado so far. We all want to give IC and BWJ a vote of thanks for the work they have done on the license plate legislation. They have been most active and have represented our group at the Statehouse. It also is most gratifying the way everybody has cooperated and worked to get our bill through the legislature. WVZ was working in Alamosa and Monte Vista during January. OYS heard ZLIBY on 160 meters but could not make him answer. The Hi-Noon Net handled 219 messages in 22 sessions. Some of the appointments in the section are due to expire so I would appreciate it if all of you would check your appointment and if it has expired or is about to do so, send in your certificates for renewal. Traffic: K0WBB 889, W0KQD 248, LNH 27, PGN 18, SWK 17, IA 11.

**UTAH** — SCM, Floyd L. Hinshaw, W7UTM — NVY is the sparkplug for the new call letter license plate bill which has been introduced in Utah Legislature. SAZ advises the Ogden Annual Club Dinner was a big success with about 60 in attendance. Director 0IC came over from Denver and renewed acquaintances. Officials of Salt Lake City and Salt Lake County are holding conferences to determine the feasibility of consolidating c.d. activities. JVA has a new 2-meter transmitter at 90 watts. SP is occupied with a complete rebuilding program of his h.f. gear and is only on the air on 2 meters and DCS frequencies. NOE has transferred to Hollywood and has been assigned his old call, 6LXI. Congratulations to WRV on receipt of his General Class license. NVY is using a model 26 printer on 40-80-meter RTTY and has results from NY to KH6-Land. Art also has 700 watts on 2 meters. Winners in the SLC Club membership drive were JVA and BRV. LKM is offering free instruction to prospective hams who wish to learn the fundamentals of radio. Those interested call Salt Lake City AM 6-2897. Traffic: W7PIM 78, UTM 3, QWH 2.

**WYOMING** — SCM, Wallace J. Ritter, W7PKX — The Wyoming Pony Express gang is working hard on the license plate bill. The outlook at present is very doubtful because of opposition in the House after a vote of twenty for and seven against in the Senate. The Sheridan Radio Club now has a Radio Officer appointed. C.d. officials have appointed a Communications Officer. We expect the RACES authorizations to start in the near future. TZK, at Aladin, is a welcome newcomer to the 75-meter groups and to the Pony Express Net. The Casper Radio club house is nearing completion and sounds very nice. UZP is back mobile on 75 meters with a Commander. PAV, the SEC, is getting the ECs lined up after some delay because of illness. Nominations for SCM are now being solicited for the coming term. We are looking for volunteers for OO and ORS appointments. Traffic: W7PKX 188, PAV 23, LLP 18, PMA 14, PAW 8.

### SOUTHEASTERN DIVISION

**ALABAMA** — SCM, Joe A. Shannon, W4MI — SEC: TKL, RM: KIX. PAMs: RNK and EBD. New appointments: NLB and PAC as ECs. Activity is picking up in Jasper. CIU reports the following active stations: CIU, BWG, DDH, WN4s HPE, BAE, and KN4s BBM, BFF.

(Continued on page 112)

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## NEW VIKING "RANGER"

Transmitter  
Exciter Kit

**\$179.50**

Immediate delivery.  
Also available wired.

Built-in VFO — TVI Suppressed — Band-switching — seven bands — 75 Watts CW Input — 65 Watts phone input. Offers more features than any Transmitter/Exciter ever built for amateurs!



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## NEW SX 96



For top performance with extra pull power and ability to tune in stations.

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18 monthly payments of \$13.60  
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Collins 75A4....\$595.00	B & W 5100....\$442.50	Hallicrafters S85..\$119.95
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Collins 32V3.... 775.00	Central 10B.... 129.50	Hallicrafters SX96 249.95
HQ140X..... 264.50	Central 20A.... 199.50	Hallicrafters SX88 675.00
Pro-310..... 495.00	Elmac PMR 6 or 12 134.50	National NC88... 119.95
Ranger Kit..... 179.50	Elmac AF-67.... 177.00	National NC98... 149.95
Ranger wired.... 258.00	Morrow 5BR-1... 73.45	National NC125.. 199.95
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KW amplifier....1595.00	Gonset Super 6.. 52.50	RME DB23..... 49.50
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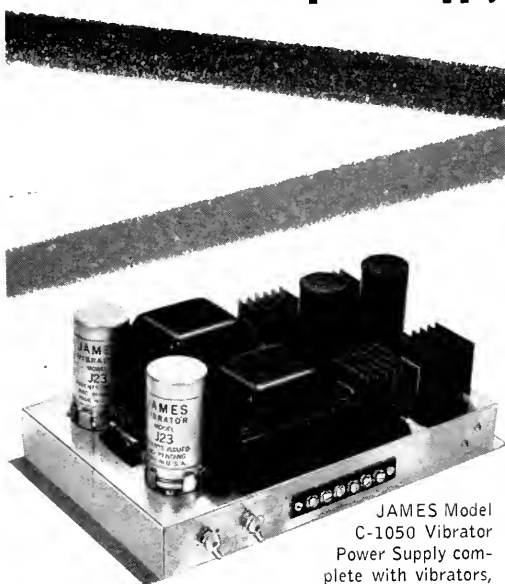
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and BEX. KN4s BOJ and BOX are new in Anniston. Three clubs have new officers: Anniston — BCU, pres.; SCM, vice-pres.; OAO, secy.-treas. Montgomery — HKK, pres.; IVC, vice-pres.; and FMW, secy.-treas. Tuscaloosa — HCV, pres.; HFK, vice-pres.; and MI, secy.-treas. K4FDY has RTTY working fine and racks up high traffic totals. UHA was designated MARS "Station of the Month" for December for "exceptional participation." COU has new SA with clipper and now is working on s.s.b. exciter. ZSQ took a delayed vacation, hamming on the way. He put in some time coaching KN4s AOZ and APF (OM, XYL) for General Class. YRO reports the following new officers of the Muscle Shoals Club: ZSH, pres.; VRC, vice-pres.; CMK, secy.-treas.; MEM, trustee. OAO is instructor in the Anniston Club sponsored code class. Traffic: (Jan.) K4FDY 1332, W4UHA 513, COU 287, ZSQ 186, WOG 88, KIX 77, YRO 66, PWS 46, AAN 38, TKL 38, HKK 28, ZSH 27, K4ACO 26, W4OAO 23, TXO 14, CAH 9, EJZ 8, USM 2, VLY 2. (Dec.) W4ZSP 110, WHW 19.

**EASTERN FLORIDA** — SCM, John W. Hollister, jr., W4FWZ — RACES as of Jan. 31st: Approved are Leon, Volusia, Pinellas, Lake, and Hillsboro. Planning are Sarasota, Manatee, Broward, Orange, and Brevard. NHN Bulletin #3: Try 3660 kc. for the NHN generals at 2230 nightly for round tables. Traffic total was 41. SDR is an ANCS. The "N" was dropped by FXP, FJE, and EHW. BKC is secretary of the Orlando Club. Use the NHN for traffic on 3725 kc. Sun. at 0800. *Bird Sparks*: UWP is using a Globe Scout 55; AZO has a code class going on the air; SRZ is s.s.b., as is PQ; IL is using 32V-3; ZPO uses a mini beam on 20 meters; NJM needs a cat. AREC: 1M reports 479 members now. IYT, Dade EC, has 149 with 40 mobiles; FIQ, of Cocoa, and YNM, of Lake City, showed big gains in January. Ft. Lauderdale: Fixed and mobile stations worked again this year with the Mothers March of Dimes. Gainesville: New club officers are TJU, WEM, TKE, K4AQR, and WN4AZB. Jacksonville: NavAir Club (W4NEK) officers are TVN, WSK, NRC, and CNC. The main activity is skeds with KG4, KZ5, VO2, KP4, VP9, CNS, ZB1, and KH6 and equipment is 75A-2A, HQ-129, NC-173, Globe King, T350-XM. FMZ and PNA are back in Jacksonville. Key West: ELS says the club at NAS is K4NCN. DRT says the emergency net is on 29,080 kc. each Wed. at 1930. Lake City: The "N" was dropped by CYG, EGS, and EGY. New Novices: KN4BKZ, KN4BNO, and KN4BOS. K4BLB is serious about 220 Mc. Miami: PBS says the DEN planning committee is IYT, VYU, VZC, PBS, YCL, IQF, ZPO, and UIW. PBS uses a 'scope for modulation checks. EHW works 3 c.w. section net for operating experience. DNU uses a Viking Ad to drive 400-watt 813 final and LVV's HRO on 20/40-Mc. c.w. He and FGO and WN4HUP are working on Novice Net plans for 40/80 Mc. DNU is in charge of Marine Reserve station (BC-610 and BC-348R). Using Telrex mini beams are KMY and PBS. The DEN member certificate was designed by YCL. Ocala: DVR uses radiomarine rig from MARS. St. Augustine: FJE uses a Globe Scout with Heathkit VFO. Traffic: (Jan.) W4JFU 536, DVR 150, IYT 136, HQ 116, WS 109, LAP 89, WEO 75, ELS 52, K4ANJ 49, W4RWM 49, TJU 46, LMT 42, DSC 19, FSS 18, DES 11, FWZ 11, WHK 10, DNU 9, FJE 9, PBS 8, HFR 6, EHW 2, WEM 2, IM 1. (Dec.) W4DNU 8.

**WESTERN FLORIDA** — SCM, Edward J. Collins, W4MS/RE — SEC: FLE. ECs: MFY and HIZ. AXP has joined RACES. PLE is working hard to stimulate interest in emergency units. HJA is going in for hi-fi. BGG meets the Gulf Coast Hurricane Net. GMS is building a 75-meter beam. QK has 813s perking FB on 75 meters. CCY is going real high power for DX. JPD works them hand over fist with the B&W 5100. BGO is working s.s.b. over Quincy way. RMO keeps the Fish Net perking. UYS and UUF keep a close watch on 14 Mc. KN4AGM is studying for Technician Class exam. PAA has a 32V-3 perking on 15 meters. MIX is heard on 20-meter 'phone. TTM/PTK have a new porthole radio. BFD is interested in ham-TV. AIA is a nightowl with a B&W 5100. MS is enjoying s.s.b. on 20 meters. ZPL is getting out FB with a vertical. IASY/4 is heard in the Pensy Area. EAR is having modulator trouble. ECT says FJR is becoming interested again. NOX/NYZ keep the rig perking out Bohemia Way. HQG gets out FB with low power. CDE is heard on 75 meters in the wee sma' hours. NN is out of the hospital and getting on FB. QU meets USNR Net drills. Traffic: K4AKP 111.

**GEORGIA** — SCM, George W. Parker, W4NS — SEC: OPE. PAMs: ACH and LXE. RMs: MTS and OCG. Nets: Georgia Cracker Emergency Net meets on 3995 kc. Sun. at 0830, Tues. and Thurs. at 1830 EST; Georgia State Net (GSN) 3590 kc. Mon., Wed., and Fri. at 1900 EST. YTO is new NCS for the Atlanta 40-Meter Net and the new frequency is 7040 kc. 5RDP/4 has been transferred from Warner Robins, and ZLS is taking over as EC for Houston County. Norm has done a fine job organizing the AREC in his community and we wish him well in his duties. YRX is going great guns with a converted ARC-5 on 75-meter mobile. 601E/4 has a new Viking Ranger on the air and working fine. ERA is working 75 meters and MARS with ¾ (Yep, three-quarters) watts input. CFJ, ZD, NS, and others have a 420-Mc. Net set up in Atlanta, using converted surplus rigs. A 160 "Flea Power" Net now is going at Camp

(Continued on page 114)

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**1955  
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**IT'S FREE!**

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## 'ADVENTURER' Transmitter 50 Watts Power Input

A really exciting, low-cost transmitter kit with enough features to interest the experienced ham as well as the novice. Completely self-contained with single-knob bandswitching and effective TVI suppression—operates crystal or external VFO. Employs 6AG7 oscillator, 807 power output and 5U4G rectifier. Covers 80, 40, 20, 15 and 10-11 meter bands.

Pi-section output network eliminates need for antenna tuner. Power supply delivers 450 vdc at 150 ma and 6.3v ac at 2 amps. Receptacle permits this supply to be used with other equipment when xmitr is not in use. Metering is provided for final amplifier plate and grid currents. Front-of-panel controls include: oscillator tuning, band-switch, amplifier tuning, coarse coupling switch, fine coupling, on/off, meter switch, key jack and crystal receptacle.

Detailed step-by-step instructions are included for wiring, no drilling or punching is necessary, and all necessary parts and hardware are furnished.

Complete with tubes, less crystals and key **\$54.95**

## HY-LITE SKY-CASTER Antennas

Structural strength and high efficiency are the outstanding features of these antennas. Have 3" diameter aluminum alloy booms. Elements are made of 1 1/2- and 1 3/8-inch aluminum tubing and are mounted to the boom with special cast aluminum clamps. Two feet of 2 3/8" pipe are furnished threaded to fit flange or mast.

### 20-Meter SKY-CASTER ANTENNAS

SC20M2	2-elements. 6db Gain. 15db front-to-back. 8' boom. 35 lbs.	\$ 85.00
SC20M3	3-elements. 9db Gain. 25db front-to-back. 16' boom. 55 lbs.	115.00
SC20M4	4-elements. 10db Gain. 30db front-to-back. 24' boom. 80 lbs.	155.00
SC20M5	5-elements. 12db Gain. 35db front-to-back. 32' boom. 100 lbs.	220.00

Each antenna is factory pre-tuned. Element lengths are adjustable and calibrated for center of bands. Supplied with T-match fed from a Balun made of RG8/U cable and fitted with coax connectors.

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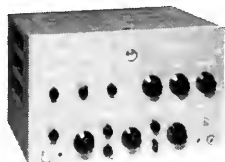
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Model R-46A speaker for above in cabinet to match **19.95**



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Has new performance features, plus the proven characteristics of the popular Model 10A. 20 watts peak output  
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peak output—SSB, AM, PM, CW. **179.50**  
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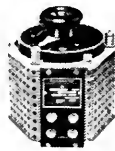
Designed for AM, CW and selectable SSB reception. Covers 160, 80, 40, 20, 15, 11 and 10-meter bands. Features include: double conversion . . . permeability tuned, hermetically sealed VFO . . . mechanical filter in IF strip . . . separate detectors for SSB and AM . . . band-pass tuning . . . new noise limiter . . . bridged-T rejection notch filter . . . built-in crystal calibrator . . . provision for 3 Collins plug-in mechanical filters.

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Gordon. DNT has left Cedartown. ZDP is back on the air with an 813. FZO has a new three-element beam for 15 meters. MA has been off the air lately because of illness. Seventeen prospective hams reported for the code and theory classes sponsored by the Atlanta Radio Club. ZD and MTS are the professors. The Charles E. Newton, Jr., Radio Club held its first meeting in Griffin and elected AFG, pres.; CZS, vice-pres.; HAO, secy.-treas.; OQT, act. mgr. The club is named for the late Charles E. Newton, Jr., W4TNT. Traffic: K4WAR 1302, W4OCG 97, PIM 94, IMQ 92, CFJ 89, ZDP 67, MTS 40, NS 38, ZD 20, BWD 16, ZWT 7, FZO 4.

**WEST INDIES**—SCM, William Werner, KP4DJ—SEC: IIZ. For the DX Contest DV had a kw. on 80, 40, and 20 meters; 200 watts on 160 meters; and 60 watts on 15 and 10 meters. ZW handles traffic on TXN at 2100 AST on 7160 kc. KD and CC are concentrating on 3.5-Me. DX while the season lasts. KD worked ZC4JA and LZ1KDP on 3.5 Me. WP1AAA has new vertical phenomenal on 3.7 and 7 Me. WP4ZC is now KP4. WP4ZT has a new Viking 1 net on 3740 kc. KD and CC are concentrating on 3.5-Me. DX while the season lasts. KD worked ZC4JA and LZ1KDP on 3.5 Me. WP1AAA has new vertical phenomenal on 3.7 and 7 Me. WP4ZC is now KP4. WP4ZT has a new Viking 1 net on 3740 kc., contact WP4ABA for details. US replaced cathode modulation with Class B plate modulation. MO is operator at MARS KP4USA. IIZ and CX are checking 144 Mc. from Monte del Estado near Mayaguez. ZN took down the 80-meter antenna and put up a 40-meter folded dipole and 20-meter Telrex beam. WT's receiving antenna is 60 feet of wire zigzagged in the room. MV and RK built Telrex-type beams. WL again is on 3925 kc. YI writes he now is W1CHC. IY moved to Seattle. DM is moving to Miami. WN, our 3925-kc. OBS, soon will have a 500-watt Globe King. W6C1W/KP4 is commander and industrial relations manager at Naval Air station and will be on with a 32V-3 and 75A-3. AZ and GX are building s.s.b. transmitters. KV4AA has a new Globe King. WAC at N.G. headquarters, and other KP4s throughout the Island participated in maneuvers handling military traffic on 3885 kc. so well that amateur radio has been incorporated into N.G.'s Emergency Plan. Traffic: KP4ZW 28, DV 4.

**CANAL ZONE**—SCM, Roger M. Howe, KZ5RM—QA is the new EC for the Atlantic Side, UD having resigned. DG had a visit from Smoky, W6UXN/MM, while the tuna clipper *Sea Prince* was in port for a Panama bait-fishing license. Also W6QDD, of Malibu, Calif., dropped in on DG. WA has installed a new cubical quad for 10 meters. In August 1954 the *SS Mataroa* had a run-in with the bank of the "Big Ditch" and was dock-bound for several days for repairs. On board was Tom, ZL3JX, who had a very nice collection of color slides of the Coronation and other interesting scenes in England. Tom was entertained by the KZ5 gang during his enforced sojourn here and as a token of his gratitude he sent us about 70 pounds of fresh-killed New Zealand pig. Recently the gang got together at the home of FL and enjoyed an excellent barbecue with the New Zealand pig playing the lead role. Traffic: KZ5WA 114, DG 95, KA 45.

### SOUTHWESTERN DIVISION

**LOS ANGELES**—SCM, Howard C. Bellman, W6YVJ—Asst. SCMs: William G. Coe, 6KWQ; and Henry G. Garman, 6BHG. SEC: QJW. PAM: PIB. We are sporting a newly-endorsed RM, GJP. We have 8 Asst. SECs, who also act as part of the 34 ECs in the section. Six amateurs are OBS, 5 are OES, 5 are OPS, and we have 12 ORS. The latest total of OOs is 12. The appointees included above rightly deserve their certificates; there is no "dead wood" listed. ORS who failed to report twice in 1954 without good reason have been cancelled. JJU is sporting new QSL cards sent from General Electric for his 1952 Edison Radio Amateur Award. K6DGW wants someone to start a KN6 QSL Bureau. K6AUZ has just moved in from the Santa Barbara section. On Jan. 30th we had a get-together at the Morris Cafe in Alhambra for the quarterly Traffic Breakfast, with W6ORS as chairman. Representatives of SCN, MTN, ALN, UTL, RN6, and MCAN-4 attended. Also attending was QR from Hemet. The next Breakfast will be run by USY. The 28th was made nicer by the free dinner at the Biltmore Hotel by the house of Weatherford, who handle radio parts and who serve the valley. When "City at Night" visited the Beverly Hills YMCA, they televised all aspects of the "Y" including an amateur radio station with NJU at the mike. Gary reports a new 15-meter beam at his place. EBK is running 300 watts a.m. and 700 s.s.b. to a 304TL final. MLZ is our new ORS. Ray has just passed around copies of the Cooperative Interference Committee Directory, listing 120 members in the 11th Radio District who have indicated their desire to assist the FCC and other agencies in the "reduction, or suppression, of interference in the community or area we serve." LVQ reports that YUY is the new president of the Whittier Radio 50 Club. K6COP has added a crystal calibrator and a Heathkit grid-dip meter to his station. "Some old boy," according to K6BEQ, is bootlegging his call on 40 and 75 meters. LXI has been reissued to its original owner, George R. Cannon, who is a TV engineer for NBC in Hollywood. He recently was on the air from the KSL transmitter at Saltair, Utah, under the call of 7NOE but is now living in Pasadena. CK was on emergency power 3 hours in January.

(Continued on page 116)

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isolated part of the time with 3-foot-deep snow up in the mountains. BGH and NNE have formed a corporation to build mobile gear, etc. BGH is the designer of the KP-81 and PR series of receivers. New president of the Rio Hondo Radio Club is UKC, who also is editor of the *Listening Post*, the club paper. Traffic: (Jan.) K6FCY 368, W6CMN 255, CAK 227, GYH 212, USY 172, MBW 150, GJP 120, YAS 118, BHG 82, K6DQA 64, W6MLZ 54, CK 34, FMG 34, K6BSD 32, COP 29, W6ORS 27, NIE 24, K6EIV 7, W6AM 4, K6BEQ 3, W6BQC 3, CBO 2. (Dec.) W6TRF 40, K6DGW 26, W6NTN 1.

**ARIZONA** — SCM, Albert H. Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH; Dr. John A. Stewart, 7SX. SEC: VRB, PAM: KOY, Arizona "Phone Net: Tue. and Thurs., 7 P.M., 3865 kc. Arizona C.W. Net: Tue. and Thurs., 8 P.M., 3690 kc. The outstanding activity of January was the participation of Phoenix amateurs in maintaining communications for the March of Dimes Campaign, sponsored by the Phoenix Junior Chamber of Commerce. Radio station KONI was on the air for 24 hours soliciting funds. As pledges were telephoned in to that station, UNL, working as an F/P with NYN, VKO, and RBA as fixed field stations, relayed the information to mobiles, who in turn sent out members of the Phoenix Hot Rod Club to pick up the donations. Besides the above, the following participated as mobiles: KOY, MOF, OIF, OQF, OSM, PMQ, SUL, UCA, UDI, and WTZ, aided by CJ, GUJ, IRX, KWB, LXX, MAE, NEL, OUE, PUP, QZH, QZX, RIJ, SUI, XP, SYV, UXZ, UYA, VMO, VMP, VMO, YFG, and 80VI. We welcome 9CZR and 5PHQ to Arizona. QFQ has a new home-built 60-watt mobile. *Remember:* The Montezuma Well Hamfest will be held May 21 and 22. Contact GYK or OAS for tickets and information. Have you made application for your Arizona call letter license plates? Traffic: W7UNL 392, RBA 96, VKO 92, KOY 38, SUL 32, QFQ 30, LQB 24, LVR 17.

**SAN DIEGO** — SCM, Don Stansifer, W6LRU — Asst. SCMs: Tom Wells, 6EWU; Shelley Trotter, 6BAM; Dick Huddleston, 6DLN. SEC: VFT. ECs: BAO, BZC, DLN, HFQ, HIL, HRI, IBS, KSI, KUU, and WYA. RM: ELQ. The big news is that Ben Hamilton, VFT, SEC for the San Diego section, won the G.E. Edison Radio Amateur Award for 1954. New TVI chairman is K6AEI, new secretary is K6AWF. Ex-K6DY now is W4EF in Florida and is looking for San Diego contacts. 3MSK/6 will be active in the area for six months. 4KRR was a visitor at the DX meeting in January. K6ILO, ex-KP4IV, 2ZAN, and 3ZAN, now is ORS in La Mesa. K2HMT now lives in Solana Beach and plans early 2-meter activity. K6ADA, vice-pres. of the Teen-age Drag Net, now is a member of the Naval Reserve. IAB and YDK attended the Southern California Trafficers breakfast. K6BTO has been reappointed OES in the South Bay Area. Ex-4VZH now is K6JOF in Del Mar. KN6JGI is a new licensee in Vista. Ex-K6BIG now is W8TKA. USZ is mobile on 21 Mc. CAE has converted his two-element 40-meter beam into a four-element 20 for the DX contest. CHV and CRT battled it out for section honors in the recent CD Party. KN6ITB was elected president of the Dana Jr. High student body, and promptly passed his Technician Class test. LRU is a new member of the Helix Club. All clubs are showing much activity preparing for Field Day. KL7AUV was a recent visitor. The Helix Club presented VFT with a large piece of luggage prior to his trip East to receive the Edison award. The following were active in the DX Contest on c.w.: K6EC, DGB, W6BZE, CAE, CHV, CRT, FFD, GBG, KSN, LRU, MGT, and W3MSK/6. BZE attended the DX meeting in Fresno. Traffic: W6IAB 3163, BSD 770, YDK 698, IZG 171, KVB 11, K6HZO 6, W6CRT 4.

**SANTA BARBARA** — SCM, Vincent J. Haggerty, W6IOX — NKT, in the San Luis Obispo Area, is quite active in his capacity as Official Observer. ZND is reportedly working on a new shack. FNP recently visited the radio club at Paso Robles. K6NBI and FYW were the only traffic reporters for the month. PP delivered K6NBI's traffic report to the SCM. Traffic: K6NBI 128, W6FYW 5.

## WEST GULF DIVISION

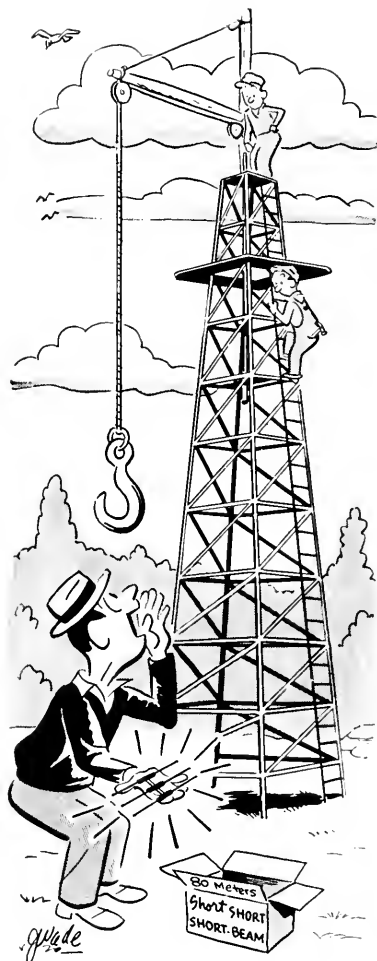
**NORTHERN TEXAS** — SCM, T. Bruce Craig, W5JQD — SEC: RRM: PAMs: PAK and IWQ. RMs: PCN and QHL. WN5FBY reports working c.w. from his car. The *Dallas 10 Meter Net Bulletin* of Feb. 5th gives information on civil defense drills and meetings, also a Chili Supper at the home of UHV. The Dallas Amateur Radio Club began code classes in November and on Jan. 7th graduated 26 out of the 143 who started. The Sweetwater Amateur Radio Club put on a demonstration of amateur radio for the Lions Club. DTA/5 needs only Delaware and Wyoming for WAS on 75 meters. UUR is looking for conversion data on R-28/ARC-5, and T-23X/ARC-5. YPI still is rebuilding his big rig, but is working all over the country on 5 watts. SFA has a new baby girl. DNY is rebuilding his 813 rig for built-in VFO. HKF has had his ticket two months and has worked 29 states with 20 confirmed with 50 watts on 75 meters. AFY, APW, DRV, AFR, and OFV have new Viking Ranger rigs. 9PIM/5 of Perrin Field, Sherman, has a new son. PWS has a 20-meter Cubical Quad. GFN lost her brother during Christmas. BDB is back in Dallas. RHP monitors the 3960-kc. Traffic Net regularly, with little

(Continued on page 118)



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traffic for Tyler. The Panhandle Amateur Radio Club held its Christmas party at the home of CKB in Amarillo. Reports have been received of amateurs assisting in the March of Dimes Drives in Longview, Amarillo, and Abilene. Traffic: W5TGU 1717, KPB 615, BKH 556, CF 141, UBW 128, PAK 121, K5FFB 119, W5AHC 63, BAT 54, ACK 32, DTA/5 29, YKE 21, OCV 19, ASA 18, WNK 14, UTR 13, NTO 12.

**OKLAHOMA** — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM; Ewing Canady, 5GIQ, SEC; KY, RM; GVS. PAMs: PML, SVR, and ROZ. OLZ, the Oklahoma c.w. traffic net (3682.5 kc.) is taking a new lease on life, with GVS as RM and with the help of JXM at Oklahoma University on TC, and is putting out a regular bulletin of interest to net members and others. The Aeronautical Center ARC has 100 per cent ARRL membership. Only one Novice reported this month, W5JUR, Lamont. The others are getting their General Class licenses like ERV, IPQ, HPW, and EJU. The ACARC, Oklahoma City, had a barbecue dinner for members and an open house afterwards with good attendance. Director CF, SCM RST, and SEC KY were there and some short informative talks and vis-a-vis ragchews resulted. The Shawnee Radio Club's new officers are NMN, coordinator, GNO, asst. coordinator, WSM, secy-treas. The Club meets on 3825 to 3840 kc. the 2nd and 4th Wed. at 2000 hours. Honorary membership certificates in the Shawnee Radio Indian Tribe are available to any amateur contacting five members of the Club. There is a new radio club in Grant County named Tom Cat Alley. The Club consists of BCI, CYQ, WN5FWP, WN5JUR, WN5CYZ, W5QJ, and other Grant County prospective amateurs. Traffic: (Jan.) W5GVS 146, MRK 102, QAC 71, ZKK 60, SVR 59, RST 41, TKI 33, MGK 27, PML 26, FEC 17, PNG 17, WSM 16, CBY 15, VBD 15, LDM 13, TC 13, ADC 12, GXH 12, ITF 10, GIQ 9, WTC 8, SWJ 7, UTC 5, EHC 4, REC 3, CYQ 2, LWG 2.

**SOUTHERN TEXAS** — SCM, Dr. Charles Fergaghieb, W5JIF — WN5JVD is working on a new deluxe rig with a pair of 6146s to be used at school in W7-Land. The problem is that 110 volts d.c. is all that is available. LSE is talking about s.s.b. and a.m. He is building kw. rigs for both. What I can't understand is that he is a c.w. man. ABQ, while recuperating from a severe heart attack, operated a 75-watt bedside rig on 20, 40, and 80 meters and enjoyed meeting old friends and handling some traffic to pass the time. This is the second year he has been confined to a bedside rig. Jerry says it renews his old feeling toward ham radio. CE is building an 813 rig so small it will go in a hat — a 10-gallon hat, that is. FDZ, ADZ, URU, and EJJ were overheard talking about the Sheriff's posse. DUG, NCS for CERN, is going strong on 420 Mc. FND is giving programs on "car-emitted speech." KQG, NCS for SARC Emergency Net, wants more activity on the Net, which meets at 6 P.M. every Thurs. QCH is hiding transmitters again. Bill Case, Paul Tarradaychick, Bro. Bill Hamm, Andy Crockett, Derwin King, and Willard Carmack recently attended the IRE Convention. SDA has a new ham shack. Traffic: W5MIN 504, ABQ 29.

**NEW MEXICO** — SCM, G. Merton Sayre, W5ZU — SEC: KCW, PAM: BIW, V.H.F. PAM: FPB, RM: JZT. The NMIEPN meets on 3838 kc. Tue, and Thurs. at 1700. Sun. at 0730; NAI Breakfast Club every morning except Sun. at 0700-0900 on 3838 kc.; NM C.W. Net daily on 3633 kc. at 1900. Because of long skip and QRM, the Tue. and Thurs. net has moved up to 1700. The Amateur Radio Caravan Club of New Mexico is sponsoring the New Mexico State Ham Picnic at Albuquerque June 4-5, with the Albuquerque Chapter in charge. In order to secure the choice of Ruidoso in 1956 for the West Gulf Division, New Mexico amateurs should plan on a large and vociferous delegation to the West Gulf Division Convention at Fort Worth June 10-12. CIN reports a new c.d. director has been named for San Juan County. QR and CEE are checking into PAN, AK, ARD, AWR, CAZ, EAP, GYN, PGJ, SUF, and SZM recently received Section Net certificates. FAG, FPB, WIY, CGE, ECS, DFJ, YXM, DED, UEO, HAG, DNK, FJE, WBA, EEM, FMX, OIA, IUE, and NSJ ranked in that order in the January V.H.F. Sweepstakes, with HGV, BXS, PQA, WNL, EDK, HLE, and 3KNW/5 also active. 0AZE/5 is a recent add-on on 144 Mc. Traffic: W5QR 75, AQQ 32, HJF 22, ZU 21, CEF 18, JZT 14, SZM 12, BAG 7, BZA 7, ARD 5, BZB 4, GEM 4, WBC 4, BXP 2.

## CANADIAN DIVISION

**MARITIME** — SCM, Douglas C. Johnson, VE1OM — Asst. SCM: Fritz A. Webb, 1DB. SEC: RR, RM: VE1HJ and VO6N. PAMs: VE1OC, VO2AW, and VO6N. ECs: VE1AAY, VE1DQ, VO2G, and VO6U. A new appointee is DW, EC for Yarmouth. Bouquets to the NBARA for a successful VE1 Contest on Jan 29th and 30th. The Dartmouth ARC is conducting code and theory instruction for newcomers. RN, XK, and UM are sporting new Viking Rangers. A visitor to Halifax was VE2LI (ex-G5LI). AAY, Fredericton EC, reports 7 Full and 2 Supporting Members of AREC. HJ and OM are QRL week nights with traffic on TRN. TA is building s.s.c. exciter. WL worked four new countries in the BERU Contest. BN is all set, having completed an all-band exciter and raised 3 antennas. PX and

(Continued on page 120)

**W3LOE**  
— • — •  
— — • —

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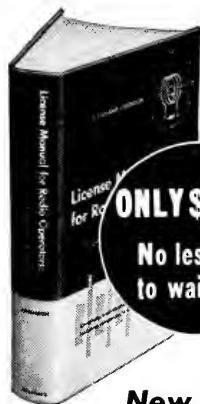
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FQ have been assisting DW as NCS on the Maritime 'Phone Net. VN has been working out on 160-meter 'phone. W4KVM is back in Virginia after a sojourn in V06-Land. SEC RR would like to see an Emergency Coordinator appointed and an Amateur Radio Emergency Corps formed in the following centers: Truro, Liverpool, New Glasgow, Middleton, Amherst, Sydney, Moncton, Saint John, Chatham, and Charlottetown. Any volunteers? V06N, Goose Bay ARC secretary, announces the annual Club QSO Party to be held from 0001Z Apr. 8th to 2400Z Apr. 11th, 20 hours operating permitted, contact total times provinces, states, and countries total for score. Log RST, date, time, and location. No interclub or net contacts count but multipliers of 2 for up-to-50 watts and 1½ for 50-100 watts input apply. Traffic: (Jan.) V06AH 207, VE1FQ 148, W4WOU/V01 132, V06N 132, V06B 79, VE1DW 67, VE1AV 58, VE1OC 45, V01T 42, V06AF 42, V06S 41, VE1HJ 25, VE1ME 24, VE1OM 19, V01AO 6, V01B 6, K6EJH/V02 5, VE1DB 2. (Dec.) VE1HJ 19.

ONTARIO — SCM, G. Eric Farquhar, VE3IA — Congratulations to Arnold Duke, popular secy. of the Quinte Club, on joining the ranks of married folks. Welcome to the Gateway Club of North Bay, now an ARRL affiliated club. 1955 executives are DM1, pres.; TX, vice-pres.; EAW, secy-treas. and editor. AZV demonstrated thyatron timing equipment at the West Side Club of Toronto. DXCC members are IIB with 126 countries and AIIV with 106. HB also has W.A.A. certificate with confirmations of 45 out of 57 countries. The v.h.f. contingent held an enjoyable affair at Oakville on the week end following the Sweepstakes. DMQ is on the air again. Highlight of the Ottawa Club meeting was an interesting talk and the showing of pictures by BBW, recently returned from Korea. Occupying new shacks are AAS and BCV. BSQ is making continued improvement after hospitalization. ATR, AJR, and DWG, on the Restricted Speed Net, 3645 kc. Sun. at 1330, solicit your participation. Originated to assist newcomers, this net deserves your support, which will determine its continuation. AVS, in Kapuskasing, reports the shack was rather cool Jan. 29th — just 42 below! AHL and BIW complete 10-meter walkie-talkies. BIW is EC for Windsor. To get away from QRMI, AOE packed the radio gear into the car and drove out to the country to enjoy a couple of hours operation in the recent CD Party. The London Amateur Radio Club, AJQ, pres.; meets the 2nd Thurs. of each month. Code classes are very popular. Bulletin editor TO welcomes the exchange of club bulletins. Congratulations to AD on the arrival of a jr. operator. NG, pres. of the Nortown Club, Toronto, has the distinction of being first to win the coveted ARRL BPL Medallion in this section. IL, communications officer for civil defense, was instrumental in the Nortown Club getting first-class quarters for meetings and operating facilities. Traffic: (Jan.) VE3BUR 182, AJR 132, GI 132, NG 102 TM 83, VZ 66, NO 12, CP 29, AUU 28, DQX 28, BJV 19, AVS 18, AOE 17, KM 13, IA 11, PH 8, DPV 5. (Dec.) VE3DPV 3.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — The MARC elected TA, pres.; HY, 1st vice-pres. and treas.; CH, 2nd vice-pres.; and Ial Moray, secy.; with HI, AKT, AMA, and KS on the board. UM has returned from V06-Land and is active on 20 meters again. OO, formerly AM and before that RI, has a Viking II with VFO on 20, 40, and 80 meters. APA, ALR, ANB, JA, and TI are heard consistently on 75-meter 'phone as representing the Trois Rivières gang. ANK has 400 watts on c.w. from the same place. ADX, station of the South Shore Amateur Club, has an 814 transmitter with CR100 receiver and reports into the Ontario C.D. Net, also the local c.d. roll call each Sun. KG is rebuilding with an 833A in the final rig all shielded against TVI. II is active from Sherbrooke on the Green Mountain Net on 3860 kc. at noon. SS is experimenting on 10-meter 'phone for EC purposes and also reports into PQN. AKO, in Sherbrooke, is badly hit by TVI and gets only an odd QSO. DJ is new in Thetford Mines. AIE is reported knocking off some good DX on 160 meters. ANR is on 75-meter 'phone regularly from Bury. FL arranged a special AREC exercise on Jan. 23rd, with planning by AFQ and AEV, in which ABS, AFH, AJQ, OB, IIL, AIU, AFQ, AEV, IFL, ZB, AMY, VE3BJE, and VE3BZM took part. WW finally worked Asia on 80 meters for EAC on that band. CA reports increased traffic with the north country and makes BPL with originations plus deliveries. LO has converted the 1154 transmitter. Traffic: VE2CA 152, DR 143, II 106, BB 69, ATQ 16, LM 14, CP 12, EC 11, GL 11, FL 9, ADX 7.

ALBERTA — SCM, Sydney T. Jones, VE6MJ — PAM: OD. RM: NG. AL is building a frequency meter and is acting net control on PLN during the absence of XG, who is rebuilding his rig to clear TVI. Alberta has lost one of its oldest and best-known amateurs. Jessop Nott, VE6JJ, passed away on Jan. 28th. He will be sadly missed by all who knew him. YE still is working on that new high-powered rig. HM reports his new vest-pocket beam is working out well. WC reports better operating conditions in the south but claims traffic is slow. The Lethbridge gang has decided to stage the 1955 Alberta Hamfest. Let's not only support them by attending, but please let them know what you would like in the way of activities during the hamfest week end. Remember, it's your hamfest. NX has his new rig on

(Continued on page 122)

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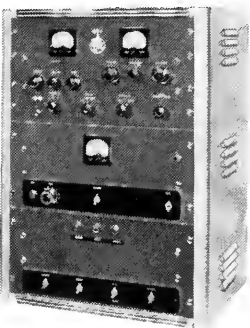
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"... we were more than pleased with this operation and wish this transmitter had belonged to one of us personally"

*and ...*

Dan Hoover (W9VEY) of Hillsboro, Illinois says, "It sure is a wonderful rig. QRM just melts and backs off to either side."

In the words of George H. Cooke (W2LOP) of 25 Cottler Ave., Springfield, N. J.: "... there is absolutely no interference on our own TV set ... Needless to say I'm very well satisfied with my purchase."

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the air and is gunning for the elusive DX. MJ is working 21-Mc., 'phone with fair results. LW has acquired an AT-1 transmitter and has plans for some modifications. Traffic: VE6HM 130, OD 17, MJ 6, WC 6, AL 3.

**BRITISH COLUMBIA** — SCM, Peter McIntyre, VE7JT — You didn't see anything in your QST column for January since "you no write, me no type." The hams at Dawson Creek are in full swing with emergency work in conjunction with the c.d. and the RCMP and the fellows at Kelowna were there with mobile and emergency gear when a hunter was lost in the mountains. Welcome to two new ECs, ADV in District 6, and AHJ, of Terrace, in District 14. District 2 on Vancouver Island now boasts 8 mobiles, namely ALL, BF, US, GP, DH, AOG, ACC, and PN. ASR, as RN7 manager, reports little activity because of poor band conditions. Congrats to AAH and his XYL on the birth of a jr. operator. Congrats to AUF and AQW and QC, who have been carrying the load on the AREC Net during the poor band conditions. If any VE5s or VE6s read this section we would appreciate their coöperation on 3755 kc. at AREC Net time. We know the frequency is not exclusively ours but think of all the free channels open during our hour of net time. We respect their net frequency of 3765 kc. so give a listen, fellows, before you start testing and bellowing. I hear the BCERARC is cooking up some new secret weapons for Field Day, including a new call, so be prepared. Traffic: VE7QC 55, ASR 23, DH 19, ZV 2.

**SASKATCHEWAN** — SCM, Harold R. Horn, VE5HR — **ADVANCE NOTICE** — The Saskatchewan Hamfest will be held at Saskatoon on July 1st week end. Plan now to attend. Get your gear in shape for the various events. Bring the family. More information will come. LJ and 6KZ/5 are active at Biggar. HJ is working in Edmonton for the winter. EO has a new NC-88 and is going to the U. S. A. for a new transmitter. YF is busy organizing hamfest details. WC visited the Saskatoon Club and attended its annual party. BD keeps 40-meter c.w. active during his spare time. MK is looking for Baker Lake contacts. FG has his scope working now and watches your signals. OB gets little time for ham radio; he is spending his spare time keeping CFQC-TV on the air. Reports have been very lean, fellows. Let's have some news so this column can be written. Officers of the Moose Jaw Club include AV, pres.; OM, vice-pres.; KG, treas.; and MG, secy. Traffic: (Jan.) VE5CW 39, MX 13, DS 7, HR 7, FG 6, CI 4, BF 2, GX 2. (Dec.) VE5CW 66.

## Jest Test

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1. High Q of 100 or better
2. Aunt Enna to finance the rig
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What device will eliminate flies and mosquitoes in a hamshack?

1. A parasitic suppressor
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— Charles A. Wilson, W9SCD

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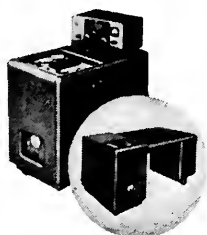
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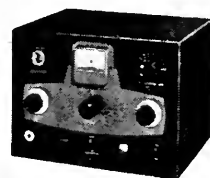
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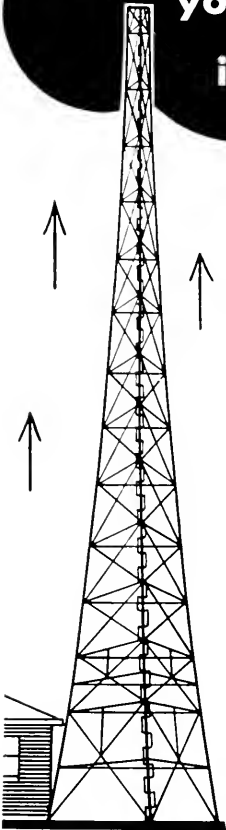
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**FEEDER SPREADERS** for constructing open-wire antenna feeders and transmission lines—made of high grade, low absorption porcelain, they're silicone impregnated.  $\frac{3}{8}$ " x  $\frac{1}{2}$ " cross section—available in 2", 4", and 6" lengths.



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zigzag symbol for inductance so that it could be used for resistance and the communication workers gave up the parallel lines for capacitance so it could be retained as a contact symbol.

Obviously, the power engineers could not immediately use the zigzag symbol for resistance because it already meant an inductance to them; so the two existing symbols for resistance had to be retained.

The communication inductance symbol is complicated and therefore expensive to draw with a drafting guide, and the small loops tend to fill with ink when a diagram is reduced to small size. The simpler form that omits these loops was accepted as a more practical alternative symbol.

Both groups gave up their capacitance symbols because the communication version was too much like the power open contacts and the power symbol had the same drafting and reduction faults as the communication inductance. There was considerable unhappiness over the compromise symbol that uses one curved and one straight line but it was the best that was thought of at the time, or since then.

Agreement could not be reached on a single symbol for electric contacts because the power group must have a very clear distinction between open and closed contacts and the communication group must be able to show a large number of contacts in a single compact assembly as is often required in telephone work. Both existing symbols were therefore retained.

Acceptance of the idea that we are using symbols, rather than pictograms of actual pieces of equipment, means that there need be no top or bottom for a symbol as there might be for a picture. Thus, a ground symbol may point toward the top or side of the drawing and the same is true of an antenna symbol, which might point toward the bottom of the sheet.

**Capacitance and Capacitors**

If you have stumbled over "capacitance" because you are accustomed to "capacity," please note that the unfamiliar form was used with malice aforethought. This is one technical matter in which the amateur has not been showing the way to the professional.

There are three basic elements: resistance, inductance, and capacitance; and they are provided by resistors, inductors, and capacitors.

Strictly speaking, capacity is the ability of a device to do work, and we should speak of the capacity of a vacuum tube as being so many watts. Its interelectrode capacitance will, of course, be stated in micromicrofarads or picofarads, which are the same things.

A condenser, again strictly speaking, is a device used with steam engines to condense the exhaust steam into hot water that is pumped back into the boiler. This saves fuel in heating

# 10

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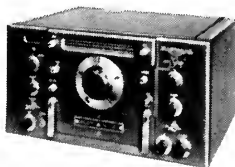
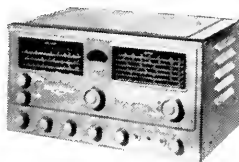
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**NATIONAL HRO-SIXTY**—Dual conversion—plug-in coil units supplied—covers 1.7 to 30 mc; band spread on 80, 40, 20, 11—10 meters. Provides virtually image-free reception. Excellent selectivity; high sensitivity; top mechanical and electrical stability. Two RF stages; ANL with threshold control; S meter; provision for crystal calibrated and NBFM adapter. \$29.15 per month for 18 months.

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HRO-60XCU-2 Crystal Calibrator . . . . . \$27.50

NFM 83-60 . . . . . \$26.75

**\$53.35**

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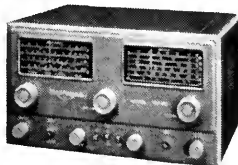
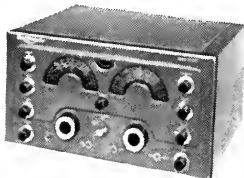
**NATIONAL NC-183D**—540 to 31 mc and 47 to 55 mc in 5 ranges. Dual conversion—a superb performer even under the most severe receiving conditions. Excellent selectivity, sensitivity, and stability. Calibrated electrical band spread for 80-75, 40, 20, 15, 11-10 and 6 meter amateur bands. Three IF stages; 16 tuned circuits—an outstanding receiver. \$21.77 per month for 18 months.

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**NATIONAL NARROW-BAND FM ADAPTER NFM 83-60** Plugs into socket provided . . . . . \$26.75

**\$39.95**

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**NATIONAL NC-88**—Top NATIONAL performance in a moderate cost receiver. Smooth operating—perfect for novices, SWL's, or the experienced amateur. 540 kc to 40 mc in 4 ranges for reception of: amateur bands from 160 to 10 meters, standard broadcast, police, aircraft, maritime, and other services. Jack provided for crystal phono pick-up. \$9.87 per month for 12 months.

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fresh water and reduces the amount of salt that gets into the boiler and causes corrosion. The electric device does not condense electricity but stores energy in the form of an electric field in a dielectric. Correspondingly, an inductor stores energy in a magnetic field.

Now, by drawing your attention to the page of preferred standard symbols that will hereafter be used in *QST*, this pedagogical character will gain that necessary interval of inattention in which he may silently close his typewriter and be gone.

## 6360 Dual Tetrode on 220 Mc.

(Continued from page 22)

form in the interest of simplicity. The actual connections for the power leads should be as shown in the main diagram, Fig. 1. The modulated plate voltage is brought in to Pin 6 on *P<sub>1</sub>*. A screen-current meter, or a jumper, should be

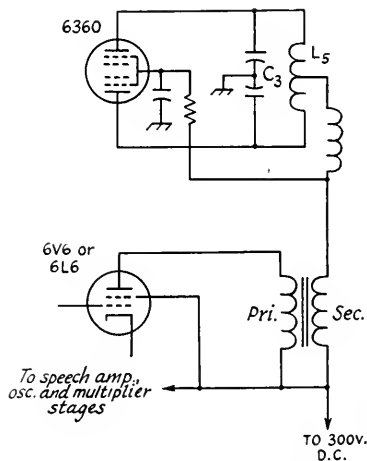


Fig. 3 — Simplified diagram showing how a modulator is connected to the final stage.

connected between Pins 6 and 7, and a plate meter or jumper between Pins 6 and 8.

A modulator of simple design that can be adapted readily to use with this transmitter was shown in *QST* for December, 1954, page 29. A 6L6 can be substituted for the 6V6GT shown in the original, if more audio power is required.

Power output at 300 volts is about 10 watts, which is enough to do interesting work on 220 Mc. if a good antenna system is used. Antenna ideas can be found in December, 1953, *QST*, or in any recent edition of either *The Radio Amateur's Handbook*, or the *ARRL Antenna Book*. The transmitter may also be used as a source of driving power for any of the larger dual tetrodes, such as the 6524, 6252, 5894 or 9903. The first two will take up to 50 watts input on 220 Mc., the latter two up to 100 watts or more.

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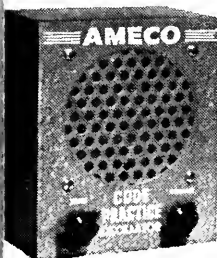
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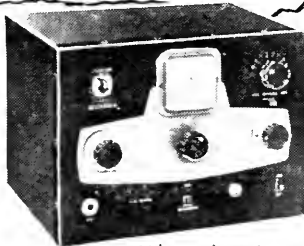
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No. 240-181-1 VIKING ADVENTURER Kit with tubes, less crystals and key. Complete with easy assembly directions and operating instructions.

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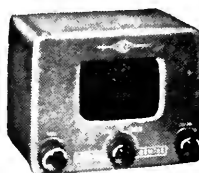
NEW!

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Monitone

MODEL 3022

3 Way Code Oscillator



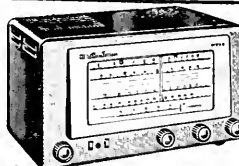
No need to tie up dollars in an instrument which can be used only for code practice purposes. The NEW MONITONE is

a multi-purpose instrument — can be used three ways: Code Oscillator, Phone Monitor and CW Monitor. Has no shock hazard on the keying system. Can be used with any CW Transmitter to monitor code sending as well as transmitter keying characteristics. At the flip of a switch it can be used as a monitor for speech quality in conjunction with a radiotelephone transmitter. Size 6 3/4" wide x 5 1/4" high x 4" deep

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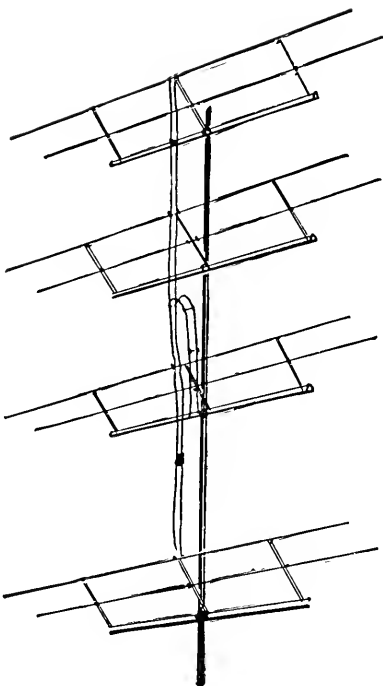
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### SOONER ELECTRONICS CO.

6239 EAST KING PLACE

TULSA, OKLA.



## Director Beams

(Continued from page 24)

center, and the position of the taps for the transmission line should be made carefully for minimum standing-wave ratio. Both adjustments can be carried out experimentally by means of a power-indicating standing-wave meter. A suitable balun is shown in Fig. 1.

One of the 12-element beams, Fig. 3, has No. 12 wire on 2-inch spreaders (for high power) for the phasing lines. Each line was made the

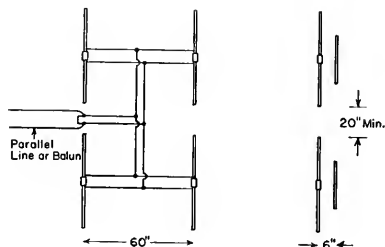


Fig. 3 — A 12-element array having a gain of 13 db. The entire system may be fed through a single tuning stub as shown.

same length, and tapped at the exact center, so that each pair of driven elements would be in phase. The whole system was then resonated with a single shorted stub approximately 40 inches long. The balun taps were about  $5\frac{1}{4}$  inches up from the short in this case. The positions for the short and the taps were found by using a temporary stub about four feet long, sliding the shorting bar and the taps until maximum forward power and minimum reflected power were indicated on the s.w.r. meter.

A 6-element array for 222 Mc. has driven elements 20 inches long, with directors  $25\frac{1}{2}$  inches long of  $\frac{1}{4}$ -inch thin-walled brass tubing. End insulators of  $\frac{1}{4}$ -inch o.d. fiber bakelite mount in a  $1\frac{1}{8}$ -inch square wooden boom  $3\frac{1}{2}$  feet long. The directors are 4 inches in front of the driven elements. The phasing line of TV ladder line is 40 inches, with a  $26\frac{1}{2}$ -inch tuning stub at the center. When 300-ohm tubular-type line is employed it is tapped  $2\frac{1}{2}$  inches up from the short. Metal construction would have been satisfactory, but in view of the small size, wood was used.

The simple 6-element array of Fig. 2 offers good possibilities for portable operation. A gain of 10 db. or more over a car antenna of the same height (more if a few feet of mast is added) can mean a tremendous improvement on long-distance contacts. Either the 6- or the 12-element beam is light in weight and of low wind resistance and can be handled readily by one man. The horizontal directivity pattern is the same with both beams (when vertical polarization is used) but the gain of the 12-element array is increased by 3 db. because of the lowered vertical angle of radiation.

(Continued on page 130)

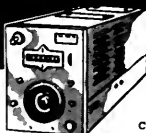
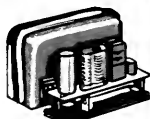
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## Page of Special Values

### BC-746 Tuning Unit Close-out

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R1800. NET..... 7.95

BC-457. As above, except frequency range: 4mc to 5.3mc. Converts to 80 meter band by changing condenser; can be used as is for single sideband VFO. Wt., 11 lbs.

R1801. NET..... 7.95

BC-459A. Same as above but brand new, orig. cartons.

R1802. NET..... 10.95

BC-457. Same as above but brand new, orig. cartons.

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### T-26 Chest Microphone

Telephone chest type unit with F-1 Western Electric transmitter. Used extensively by U.S. Army. Fits snugly, wearer hardly knows it's on. Ideal for mobile use.

A551. NET..... 2.25

### T-30-V Throat Microphone Bargain



Mike fits snugly, comfortably around throat. Allows complete freedom of head and arm movement. Carbon mike works with any 200 ohm impedance input circuit. Ideal for U.H.F. mobile work for amateurs. With strap, 10" cord, plug. Wt., 1 lb.

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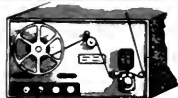
R1200. NET..... 2.45

10 Hy. 150 M.A., Resistance 18 ohms. Size: 3x2 $\frac{3}{4}$ x3 $\frac{3}{4}$ ". Sealed case. Ceramic terminals. Made to Government specifications.

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10 Hy. 100 M.A., Resistance 18 ohms. Ceramic Terminals. Size: 2 $\frac{1}{2}$ x2x3 $\frac{1}{4}$ ". Four 8/32 Mounting screws. Mounting centers 1 $\frac{7}{8}$ x1 $\frac{5}{8}$ ".

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### TG-34A Practice Code Keyer

Ideal for beginners learning code, or classroom demonstration. Automatic unit for reproducing audible code practice signals previously recorded in ink on paper tape. Self-contained speaker provides code practice signals to one or more persons or can be used as a keying oscillator with hand key. Compact, portable carrying case. With tubes, less tape. Size: 10 $\frac{3}{8}$ x10 $\frac{1}{2}$ x15 $\frac{1}{2}$ ". For 115-230v. 50-60 cyc. A.C. Wt., 45 lbs.

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A conventional 6-element Yagi with one reflector and four directors gave a measured gain of 9 db. over the reference dipole. A special Yagi with two shortened driven elements and four directors (no reflector) gave 10-db. gain at 145 Mc. Apparently, this design can be used on Yagi antennas to give better performance, and preliminary calculations indicate that a single long Yagi can be tuned up to operate over one megacycle of the 2-meter band with a forward gain of 17 db. This would involve a boom length of some 24 feet, however. Experimentally, it may be possible to better this figure for a very narrow bandwidth. This offers interesting possibilities for long-distance 2-meter c.w. communication, say, between 144.0 and 144.2 Mc., with selective receivers and a few hundred watts of transmitter output.

## "Tiny Tim"

(Continued from page 27)

be operated from a car using an 8-foot whip, properly loaded, worked against the car body as ground. I'm even thinking of trying it as aircraft mobile!

With this self-contained ham station you build yourself, you're ready for any emergency with a reliable, low-power c.w. station on 40 and 80 — and you can have plenty of fun with it from your home station, out in a boat, at the beach, climbing a mountain, or whatever.

I wish to acknowledge the helpful suggestions of the late Walter Bradley, W1FWH, of ARRL, and the assistance of my 11-year-old son, WN1BRS, in assembling the rig and manning the home station during tests.

## I.F. Amplifier

(Continued from page 34)

The over-all bandwidth of the amplifier can be calculated from

$$\Delta f \cong k_c f_o \sqrt{2} \sqrt[4]{\left[\frac{1}{m^2}\right]^{\frac{1}{n}} - 1}$$

voltage at  $\frac{\Delta f}{2}$  cycles off resonance

where  $m = \frac{\text{voltage at } \frac{\Delta f}{2} \text{ cycles off resonance}}{\text{voltage at resonance}}$

$n$  = number of identical stages.

For the bandwidth at 3 db. ( $n = 3$ ),

$m = 0.707$ ,

$\Delta f = 112$  cycles.

The response curve of the complete amplifier is given in Fig. 6. The bandwidth is 220 cycles at 20 db. down and 1000 cycles at 100 db. down.

## B.F.O.

In the unit constructed by the author, the b.f.o. inductor,  $L_7$ , has a  $Q$  of about 25. The coil

(Continued on page 132)



# LAFAYETTE'S

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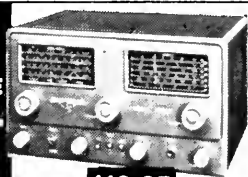
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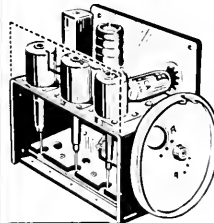
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Complete with 6 AF4,  
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Tunes all UHF channels 14-82. Most advanced engineering, three cavities, two used as bandpass pre-selector, one controlling local oscillator. Features frequency stability, uniformly broad bandwidth, high selectivity, low noise, high gain. Completely shielded. Ideal for building converters. Size 3 1/2" H x 4 1/4" W x 4 3/8" D. Shpg. Wt. 4 1/2 lbs.

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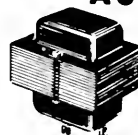
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Has one 5U4 socket on top. Plate voltage 650V c.t. at 250 mls. rectifier 5V at 3 amps. Fil. #1—6.3V at 9 amps. Fil. #2—6.3V at 1.2 amps. Fil. #3—6.3V at .9 amps. 5 volt winding and high voltage terminate at socket. This hard to get type replacement was used in thousands of TV sets. Shpg. Wt. 14 lbs.

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## High Output Dynamic Microphone

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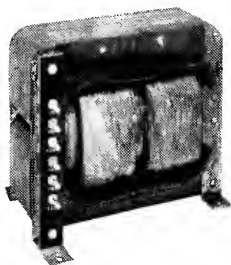


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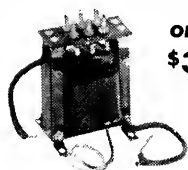
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Brand new Acme Plate Transformer. Primary tapped for 98-104-110-116 and 123 Volts — 60 Cycle. Secondary 3100-0-3100 Volts A.C. @ 500 Mils.

Insulated for 15,000 Volts with impregnated mica. Balanced secondary windings. 9" long x 8" high x 7 1/2" wide. Shipping weight 60 lbs. Cost the manufacturer for whom they were made over \$70.00 each. Don't miss out on this super value.

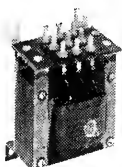
### RECTIFIER FILAMENT TRANSFORMER



only  
**\$3<sup>95</sup>**

2.5 Volt C.T. — 10 AMP. Secondary. Primary tapped same as plate transformer. 10,000 Volt insulation. 3 1/2" long x 4 1/2" high x 3" wide.

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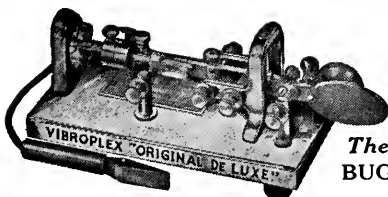
.5 MFD-4000 Volt Sprague Vitamin "Q" oval can capacitors. Single insulated terminals. (Can is common.) Use several of these in parallel for a low cost filter capacitor 2" x 1" 4-5 8".

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was wound in the form of 3 pies on a 1-inch-diameter bakelite rod. Commercially-available chokes could be used and turns removed to give the right inductance value. For *Qs* much different than specified, some adjustment of the feed-back condensers *C*<sub>2</sub> and *C*<sub>3</sub> and the anode load resistance will be necessary. The oscillator was built in a 3 × 4 × 5-inch metal utility box with the tube mounted on one side. The cathode choke coil was pi-wound on a small form. This choke coil is, however, readily obtainable from commercial stock. The oscillator tunes from 20.4 to 23 kc. The low-frequency limit is set by the fixed bandset condenser.

### Power Supply

Although an electronically-regulated power supply was used, it is not absolutely necessary. It does, however, provide a power source having a low output impedance at 20 kc., and thus lends to the over-all stability of the amplifier. The voltages are made available for use with external audio filters and clippers through an octal plug. It is convenient to be able to draw current from the power supply without upsetting the amplifier supply voltages.

### 5-Band Antenna Coupler

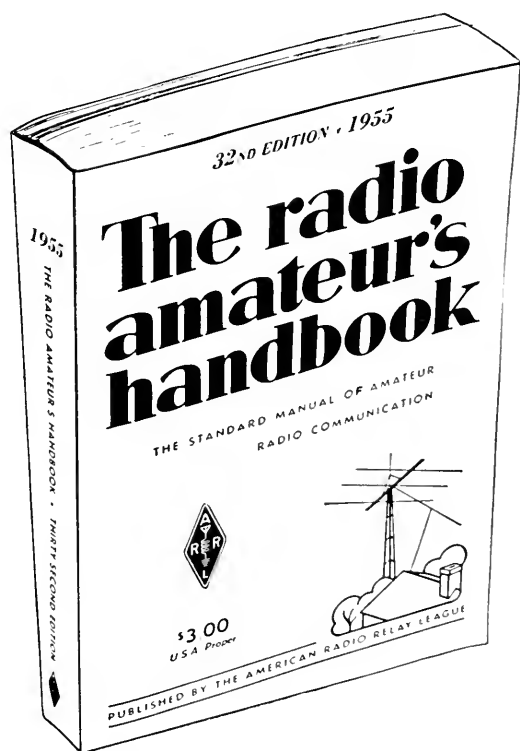
(Continued from page 40)

the feedline plus antenna, not feedline plus half the antenna.

In many instances it is more convenient to put up a Zepp antenna than a center-fed one. If, however, there is only room for a 66-foot antenna (half wavelength at 7 Mc.) and 80-meter operation is desired, the feeders can be tied together in the shack and connected to one of the antenna terminals of the coupler. If it will work with a parallel connection, fine; if it won't, a series connection can be tried, with the other antenna terminal of the coupler connected to ground. An antenna worked this way is a "random" length of wire, and consequently, the same tuning procedure applies to a piece of wire that is actually a random length and doesn't have any feedline. The trouble with antennas lacking a true feedline is that they are sometimes responsible for "r.f. around the shack," as evidenced by r.f. on microphones and cabinets.

### Harmonics

One last bit of information worth passing along to the newcomer who may not know one of the values of using a coupler: As many amateurs have found to their sorrow, harmonics of their transmitted signal can get them into trouble with the FCC. The use of a link-coupled antenna coupler provides considerable attenuation of harmonics, usually enough to keep them from interfering with other services. And if one is experiencing TVI caused by harmonics, the coax link line between the transmitter and the coupler furnishes an ideal spot for the installation of a low-pass filter.



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## HIGHLIGHTS OF THE 1955 HANDBOOK:

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This outstanding transmitter has been acclaimed a great performer throughout the world. Air wound plug-in coils used for high efficiency. Takes any freq. from 1.6 to 30 mc. Ideal for General Class, Novice, CAP, CD, Industrial. Sold direct from our factory, ready to operate. 40 to 50 watts input, Phone-CW. Complete with 8 x 14 x 8 cabinet, 40 meter coils, xtal, tubes: 6V6 osc., 807 final, 5U4C rect., 6SJ7 xtal mike amp., 6N7 phase inv., 2-6L6's PP mod. Wt. 30 lbs. \$79.95, 80, 20, 10 meter coils \$2.91 per band, 160 meter coils \$3.60. MODEL 130 FOR 120 TO 130 WATTS — \$199.50

MODEL 242 FOR 2 METERS — 45 WATTS INPUT — 6146 FINAL. Complete with mobile connections, A.C. power supply, tubes, xtal, xtal mike input. Uses 8 mc. xtals. Swinging link matches 52 — 300 ohm antennas. Same cab. as 240. \$89.95. Also 6 meter model.

150 WATT ANT. TUNER matches any antenna, 8 x 10 x 8 cab. \$20.00. Coils extra: 160 — \$4.30, 80 — \$3.45, 40 — \$2.73, 20 — \$2.40, 10 — \$2.31.

VFO FOR ANY OF ABOVE TRANSMITTERS — \$49.95  
Send full amount or \$25 with order — balance C.O.D.

## LETTINE RADIO MFG. CO.

62 Berkeley St.

Valley Stream, N. Y.

## How's DX?

(Continued from page 69)

doubtful can things get!). ZC4FB further understands that there now are no private amateur stations permitted in Bulgaria; only club combos. Personal call signs are assigned but LZ1RF, the last private LZ installation operative, long has been QRT. . . . . K6EUV never quite made it to Gibraltar as ZB2N but John gave it a good try in late December and early January. Bogged-down transportation undid his plans after all other red tape laboriously had been severed. K6EUV, who had similar difficulties trying to get to St. Pierre a few years ago, advises all would-be DXpeditioners: "Make all possible investigation of transportation facilities. Also make allowance for 220-volt 50-cycle lines which are quite common outside North America. Take along many duplicate copies of your gear list to save time in placating hordes of customs officials. Have an ample supply of spare components, especially tubes, which you probably will find almost impossible to obtain in any rare-DX area." . . . . . W2JIL passes along WASP (Worked All Sicilian Provinces) details. Confirmations from five of these IT1 provinces are required: Agrigento, Caltanissetta, Catania, Enna, Messina, Palermo, Ragusa, Siracusa and Trapani. QSOs must be dated after July 1, 1952, and must be either all c.w. or all 'phone. The five pasteboards plus four IRCs should go to IT1TAI at Box 300, Palermo. . . . . DL4OR hit a brick wall in efforts to carry out his HV1OR intentions but still hasn't given up the idea.

South America — OA5G (ex-KR6LE-9BPR-W9FCJ, W6ZLH) is really roughing it in San Juan, 250 miles southeast of Lima. The nearest telephone is 50 miles away (and no prospects of TVI, either!) . . . . . W8GZ coordinated the efforts of many charitable U. S. amateurs who contributed toward outfitting FY7YE with an effective DX-band installation. Mario now pours out potent r.f. with his new TBS-50D and associated equipment. . . . . W4UEL paid a personal visit to widely-worked YV5FL where s.s.b. is the rage. . . . . VP8 notes via U.K.-bound ex-VP8AZ: VP8AQ QSY'd from So. Orkneys to So. Shetlands. VP8BD (ex-VP8AK) holds forth from Port Lockroy, Grahamland. VP8BF radiates from So. Shetlands and so does VP8BH (Deception Isle). VP8BC works Zs and Ws without much difficulty with his Falklands 7-Mc. 3-watter. VP8AZ barely managed to complete his WAS before closing down in late January; Mike also comments on the fine reception of WIAW's code practice and bulletins on 80 meters. South Sandwich hamming is nil with no prospects in sight, but South Georgia may see a new VP8 or two firing up shortly. VP8AY's first QSO from the Falklands was with W4YHD. . . . . W3AXT of DXerama fame points out that 7-Mc. c.w. candidates LU1XP 9YG and PY7RY represent very rare areas toward South American DX certificate awards.

Hereabouts — We regret to note the passing of inveterate DXers IIC2JR and YS1RP. HC2JR's radiotelephone DX and DXpeditionary (Galapagos Isles) achievements are all the more remarkable in view of his confinement to a wheel chair for many years. . . . . Servicing of Navassa Light now is done out of Miami instead of San Juan, P.R. KP4KD reports that this change puts the quietus on KP4TF's anticipated KC4 lark. . . . . Huge joint meets of NCDXC-SCDXC and FRC-PVRC outfits lived up to the wintry DX scene. Both affairs featured the appearances of various well-known DX personages and many yards of yarn were spun to the enjoyment and edification of all who attended. . . . . VP7NG, who has rolled up over 1400 QSOs with some 78 countries in just four months of Bahamas-style hamming, is coaching FG7XB on the finer points of the art. Glen also will provide Antoine with an ample stock of QSLs. VP7NG will remain on the air for another six months or so. . . . . Since November, 1945, KP4KD has knocked off different DX stations at a rate of slightly less than one a day — a 2912 total. . . . . First ticketed as 9AXS in '23, K6ENX has held numerous calls including Ws 3EHT 6NHC 0MWK and XU8MI. As XU8MI in Shanghai, 1939-1940, Otto's most memorable QSOs were with VP5PZ and W2BHW (now W8BHW) on 7 Mc. Now retired after 27 years of Navy service, K6ENX is hot on the DXCC trail. . . . . W1ATE, radiotelephone DX pundit in spades, becomes a Jersey W2 and doubtless will try his hand at a southern antenna plantation.

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Vesto Towers are available in a wide range of sizes to meet requirements of amateurs and commercial users alike. Note the low prices for these quality lifetime towers: 22'—\$104, 25'—\$127, 33'—\$149, 39'—\$182, 44'—\$208, 50'—\$239, 61'—\$299, 100'—\$895.

Towers are shipped to your home knocked down, FOB Kansas City, Mo. 4th class freight. Prices subject to change. . . . . so order now! Send check or money order . . . . . or write for free information. Cable address: "VESTO"

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Buy the VFO Exciter and its power supply, complete, ready to operate, for only

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Then, you can wire in the KW final amplifier, right in the space provided for it in the upper cabinet, where the sockets and shield are already mounted. Complete Collins kit of parts, blower, and detailed instructions, less tubes and power supply ..... \$ 215

Exciter, with KW final built in, by Collins \$1,225

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Only \$120, complete with matching Balun. All ready to put up and plug in your RG-8/U coaxial cable. No tuning, no pruning, no fussing with matching. With TELREX you are buying proven performance with no guesswork.

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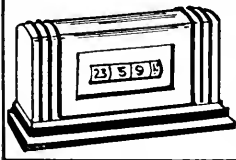


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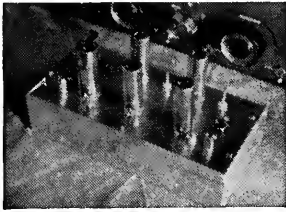
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- **USES 6BZ7, 2 — 6CB6, 2 — 6J6 tubes.** COMPLETE with plugs, tubes and crystal. **\$42.50**
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(Continued from page 64)

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Norfolk, Mass. (W1CLF) <sup>27</sup>	51
Norfolk, Va. (W4PAK) <sup>18</sup>	317
North Adams, Mass. (W1MKD) <sup>28</sup>	59
No. Baltimore, Md. (W3NAZ) <sup>32</sup>	—
Oak Ridge, Tenn. (W4SGI)	127
Onondaga Co., N. Y. (W2CYD) <sup>33</sup>	238
Orange Co., Calif. (W6DEY) <sup>16</sup>	201
Orange Co., Ind. (W9QQY)	125
Ossining, N. Y. (W2PSH) <sup>33</sup>	72
Pinellas Co., Fla. <sup>32</sup>	—
Pipestone & Rock Cos., Minn. (W0KFN)	69
Pittsburg Co., Okla. (W5BGC) <sup>6</sup>	125
Pittsburgh, Pa. (W3OMA)	508
Polk & Haralson counties, Ga. (W4IMQ)	57
Pueblo, Colo. (W0NIT)	120
Queens Co., N. Y. (W2IAG)	135
Ramsey Co., Minn. (W8HKF)	220
Regina Area, Sask. (VE5CW)	112
Robeson Co., N. C. (W4SOD)	58
Rockingham Co., N. H. (W1CDX) <sup>6</sup>	99
St. Johns Co., Minn. (W0EBX) <sup>6</sup>	15
St. Joseph Co., Ind. (W9Z1B)	163
St. Louis, Mo. (W0RCE)	344
St. Louis Co., Minn. (W0EBX) <sup>28</sup>	93
San Fernando Valley, Calif. (W6HOW) <sup>22</sup>	122
San Francisco Section, Calif. (W6GGC) <sup>32</sup>	—
San Luis Valley, Colo. (W0KQD)	75
Sarasota Co., Fla. (W4LMT)	62
Schoharie Co., N. Y. (W2NAI)	96
Seneca Co., Ohio (W8WAB)	128
Sheboygan, Wis. (W9MYG) <sup>33</sup>	115
Springfield Area, Mo. (W0HUI)	136
Stark Co., Ohio (WSAL) <sup>6</sup>	163
Superior & Douglas Co., Wisc. (W9GUY) <sup>33</sup>	112
Tacoma, Wash. (W7RGD) <sup>6</sup>	79
Tompkins Co., N. Y. (W2QBZ)	—
Union Springs & vicinity, Ala. (W4PWS)	23
Vallejo, Calif. (W6ZZF)	62
Wabash River Basin, Ind. (W9TT) <sup>33</sup>	158
Waltham, Mass. (W1JSM) <sup>22,33</sup>	131
Wausau, Wis. (W9VHA) <sup>25</sup>	123
Weakley Co., Tenn. (W4FLW) <sup>25</sup>	37
Wheatland Co., Mont. (W7NPV)	108
Whittier, Calif. (W6LVQ) <sup>13</sup>	259
Wichita Falls, Texas (W5UUR) <sup>29</sup>	57
Winnebago Co., Ill. (W9CZB)	137
Winona & Houston counties, Minn. (W0LUX)	49
Winston-Salem & Forsyth Co., N. C. (W4TQU) <sup>30</sup>	256
Winthrop, Mass. (W1BB) <sup>31,33</sup>	227
Woodridge, N. J. (W2DMJ) <sup>32</sup>	—
Wyandot Co., Ohio (W8SPU)	20
Grand total for the nation	18,369

The following ECs reported that no SET was held: W1LKP (So. York Co., Me.); W3DUI (Luzerne Co., Pa.); W4CFV (Norton, Va.); W5LGY (Commerce, Texas); W5TGW (Lamb Co., Texas); W6JWD (Palo Alto, Calif.); W8OPU (Knox Co., Ohio); W9ZMU (Jo Daviess Co., Ill.). Give them credit for reporting, anyway. We should also mention that we received a message from W8DFC (EC, Princeton, W. Va.) indicating availabilities in his area. We have word from W8IPT that Montgomery Co., Ohio, participated in the SET, but nothing heard from the EC. Oregon SEC W7ESJ reports some SET activity in his section, although we have not heard direct from the ECs, except from W7ISP (listed above).



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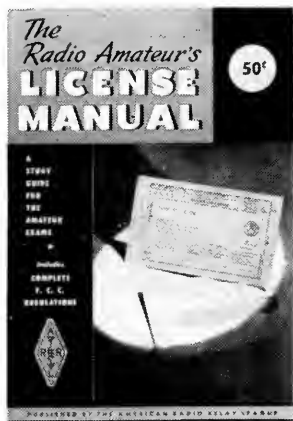
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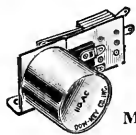
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SPDT.....	5.90	5.60	
DPST.....	6.00	5.70	
DPDT.....	6.25	5.95	



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## V.H.F. SS

(Continued from page 59)

*Matne*  
WITAM...216- 27- 4-AB  
WITJN...32- 8- 2-BC  
WNIBBB...12- 6- 1-B

*Eastern Massachusetts*  
WIELP...1274- 91- 7-AB  
WINCO...868- 62- 7-B  
WIJSM...830- 83- 5-B  
WIVXW/1...800- 80- 5-B  
WIVVB...696- 87- 4-B  
WIJNX...584- 73- 4-B  
WIAEQ...540- 54- 5-B  
WILUW...520- 65- 4-AB  
WIZEN...400- 50- 4-B  
WIDJ...384- 32- 6-A  
WIAGN/M

300- 30- 5-AB  
WISIV...300- 50- 3-B  
WIPYM...294- 49- 3-B  
WIAQE...264- 44- 3-B  
WINXY...252- 42- 3-B  
WIQMN/1...246- 41- 3-B  
WILHW...240- 40- 3-B  
WILROC...240- 40- 3-B  
WIHL...222- 37- 2-B  
WNICQU...210- 35- 3-B  
WIPEX...168- 28- 3-B  
WIJYC...132- 17- 4-A  
WIOIB...112- 14- 4-A  
WIJCI...110- 12- 2-B  
WIPBM...104- 26- 3-B  
WIVBT...96- 16- 2-B  
WIRGY...84- 14- 3-A  
WIIYM...84- 21- 2-B  
WICTR...48- 8- 3-B  
WIOQW...48- 12- 2-B  
WIOXV...40- 20- 1-B  
WIVYK...18- 9- 1-B  
WIOOP (WIOOP, W6JWA)  
1716-143- 6- ABCD

WICBA (WIs BOA CBA  
ZCQ)  
WIMHL (WIs VZR YTL,  
WNIDDN)  
390- 65- 3-B  
WIIYZ (WIs LJN YIZ)  
240- 40- 3-B

*Western Massachusetts*  
WIRFU...5668-218-13-AB  
W2BVB/1...1470-199-12-AB  
WIVNH...3410-155-11- ABCD  
WIOBQ...1602- 89- 9-B  
WICJK...1092- 78- 7-B  
WNIZWL

1078- 77- 7-B  
WIRVW...840- 84- 5-AB  
WIBXB...664- 83- 4-AB  
WINY...504- 63- 4-B  
WINLE...480- 60- 4-B  
WIESA...435- 47- 5-B  
WIMNG...423- 73- 3-B  
WISWJ...408- 51- 4-B  
WICNS...368- 46- 4-B  
WITDO...330- 55- 3-B  
WIRRX...312- 52- 3-B  
WIJWV...280- 35- 4-B  
WITAY...264- 35- 4-B  
WIKUE...240- 30- 3-B  
WIEVZ...231- 39- 3-B  
WIOY...208- 52- 2-B  
WIPHU...204- 34- 3-B  
WNIDHA/M

174- 29- 3-B  
WNIZXM...114- 24- 3-B  
WNICSE/1...116- 29- 2-B  
WIDWV...84- 22- 2-B  
WIBB...72- 18- 2-B  
WISRM...72- 18- 2-B  
WILPC...64- 16- 2-B  
WISQY...52- 13- 2-B  
WICOD...52- 13- 2-B  
WIIYC...48- 12- 2-A  
WIOJV...24- 6- 2-B  
WIMOK...10- 5- 1-B  
WIVDE/1 (WIVDE,  
W3QKY)  
1414-102- 7-B

*New Hampshire*  
WIIUZ/1...5603-216-13-AB  
WIAZK...1562- 71-11-AB  
WIPDN...432- 27- 8-B  
WIFZ...232- 29- 4-AB  
WIBWM...102- 17- 3-AB  
WNICFL...28- 7- 2-B

*Rhode Island*  
WIKCS...1302- 93- 7-AB  
WIPX1...636- 53- 6-B  
WIAJR...420- 35- 6-B  
WIVDI...360- 45- 4-B  
WNICVF...222- 37- 3-B  
WIEUF...120- 35- 2-B  
WNICPC...84- 21- 2-B

*Vermont*  
WIMMN...368- 23- 8-B

### NORTHWESTERN DIVISION

*Oregon*  
W7INX<sup>5</sup>...156- 39- 2-AB  
W7OKY<sup>5</sup>...156- 39- 2-BE  
W7HBB...148- 37- 2-AB  
W7NGW...144- 36- 2-AB  
W7MTT...92- 23- 2-B  
W7WRA...88- 22- 2-B  
W7WQZ...48- 12- 2-B  
W7BTF...44- 22- 1-B  
W7SQP...38- 19- 1-B  
W7JIP (W7s JIP OAY)  
188- 47- 2-ABE

*Washington*  
W7JHX...300- 50- 3-B  
WN7WSP...188- 25- 2-B  
W7NNR...104- 26- 2-B  
W7LMB...74- 37- 1-B  
W7QKE...68- 34- 1-B  
WN7VVB...68- 34- 1-B  
W7AXS...46- 23- 1-ABC  
W7KO...44- 22- 1-AB  
W7PVZ (W7s POP PVZ  
RKS WN7s VXR WGG  
YCN) 78- 39- 1-B  
W7IYV (W7s GRM LCS)  
38- 19- 1-B

### PACIFIC DIVISION

*Nevada*  
W7JU.....12- 3- 2-B  
*Santa Clara Valley*  
W6SAW...1140-114- 5-B  
W6RQQ...440- 45- 5-B  
KN6HYW/6  
360- 45- 4-B  
W6ZBS...224- 28- 4-B  
W6UW<sup>8</sup>...78- 13- 3-B

*East Bay*  
K6ERR...940- 94- 5-B  
W6UTX...450- 75- 3-B  
W6SKX...432- 54- 4-B

*San Francisco*  
W6AJF...510- 51- 5-ABD

*Sacramento Valley*  
W6WFW...750- 75- 5-B  
W6KHIT<sup>6</sup>...640- 64- 5-ABD  
W6LSB...550- 55- 5-ABD  
W6GIV...590- 59- 5-B  
W6MIW...265- 27- 5-B  
KN6HIK...260- 26- 5-B  
KN6IYD/6...180- 30- 3-B  
W6CIS...4- 2- 1-B

*San Joaquin Valley*  
W6OHQ/6...510- 51- 5-BD  
W6GQZ...204- 34- 3-AB  
W6EXH...120- 20- 3-AB

### ROANOKE DIVISION

*North Carolina*  
W4NHW...48- 24- 1-B  
W4MRH...34- 17- 1-B  
W4BUZ...32- 16- 1-B  
W4CVQ...32- 16- 1-B  
K4AMX...30- 15- 1-B  
W4YSB...24- 12- 1-B  
W4YLU...22- 11- 1-B  
W4ACY...20- 10- 1-B  
W4EKB...20- 10- 1-B  
WN4EJU\*...20- 10- 1-B  
W4SMA...18- 9- 1-B  
W4YJG...18- 9- 1-B  
W4MDA...16- 8- 1-B  
W4CPI...14- 7- 1-B  
W4WDH...12- 6- 1-B  
KN4AXF...12- 6- 1-B  
KN4BJM...11- 6- 1-B  
KN4AWL...8- 4- 1-B

*Virginia*  
W4AO...3806-173-11-B  
W4UBV...1862-133- 7-AB  
W4DWU...1212-19- 6-B  
W4JCJ...984- 82- 4-B  
W4UMF...524- 66- 4-ABC  
KN4ARV...228- 38- 3-B  
WIBJS/4...156- 39- 2-B  
W4RL...150- 25- 3-AB  
W6LON/4...108- 2- 2-B  
W4ABQ/4 (W4APQ,  
WN4EMN)  
352- 44- 4-B

(Continued on page 140)

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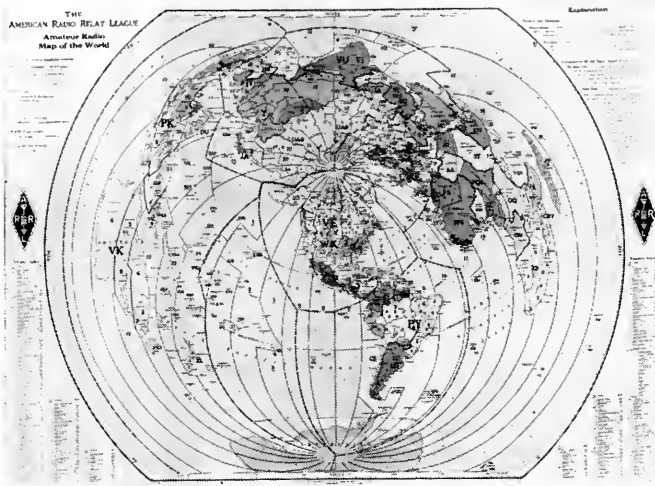
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192-24-4-B

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Utah

W7QDJ... 10-5-1-B

### SOUTHEASTERN DIVISION

Alabama

W4LNG/4... 28-7-2-B  
W4LSQ... 18-3-3-B  
W4TKL... 6-3-1-B

### SOUTHWESTERN DIVISION

Los Angeles

W6WSQ... 2100-210-5-B  
K6ACF... 1368-171-4-B  
KN6GMV... 1304-163-4-B

KN6GHJ... 500-125-2-B  
W6LIT... 492-82-3-B  
W6MRH... 420-105-2-AB  
W6MMU... 348-58-3-ABDE

K6CJQ... 240-60-2-B  
W6HZ... 184-46-2-ABC  
KN6HDO... 28-14-1-B  
K6BNV (K6S BNV CXF,  
KN6IDB) 66-22-1-B

### WEST GULF DIVISION

Oklahoma

W5HGH... 36-9-2-B  
W5HXX... 36-9-2-B

W5NDE... 32-8-2-B  
W5DFU... 28-7-2-B  
W5VKH... 28-7-2-B  
W5PZ... 24-6-2-B  
W5EGC... 6-3-1-B

New Mexico

W5FAG... 50-25-1-BD  
W5FPB... 48-24-1-B  
W5WVY... 44-22-1-B  
W5GCE... 42-21-1-B  
W5ECS... 42-21-1-B  
W5YXM... 40-20-1-B  
W5NDFJ... 40-20-1-B  
W5DED/5... 36-18-1-B  
W5UEO/5... 32-16-1-B  
W5HAG... 28-14-1-B  
W5DNK... 24-12-1-B  
W5FJE... 22-11-1-B  
W5WBA... 22-11-1-B  
W5EEM... 20-10-1-B  
W5FMM... 20-10-1-B  
W5NBDJQ... 20-10-1-B  
W5CFJ... 18-9-1-B  
W5OIA... 18-9-1-B  
W5N5UE... 12-6-1-B  
W5NSJ... 4-2-1-B

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Ontario

VE3DIR... 1104-92-6-B  
VE3AIB... 712-89-4-AB  
VE3DNX... 576-72-4-B  
VE3BOW... 312-52-3-AB  
VE3ATB... 140-35-2-AB  
VE3DMQ... 108-27-2-B  
VE3UT... 108-27-2-B  
VE3DHG... 96-24-2-B  
VE3CAU... 84-14-3-AB  
VE3BWE... 64-16-2-B  
VE3OJ... 56-14-2-AB  
VE3PL... 36-9-2-AB  
VE3KM... 18-9-1-B  
VE3DRV... 10-5-1-B

<sup>1</sup>W3VB, opr. <sup>2</sup>Two-way tie for Technician award. <sup>3</sup>W2JCI, opr. <sup>4</sup>W2TUK, opr. <sup>5</sup>Two-way tie for section award. <sup>6</sup>Hq. staff; not eligible for award. <sup>7</sup>W1QIS, opr. <sup>8</sup>K6BBD, opr. Logs for checking purposes were also received from W1AGB, W1BJP, W1LMU, W1MGP, W2VKP, W3AHQ, W4MKJ, W6DEF and W6UCR. Thank you.

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Bandswitching



5" x 8" x 7"

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W1MEF, Howard A. Perrigo, Hamden, Conn.  
W1UPZ, Helen M. Wright, Brookline, Mass.  
W2JDS, Mathias L. Connes, New York, N. Y.  
W3PBK, John J. Kelley, Philadelphia, Pa.  
W3QXY, Leslie W. Mill, jr., Prompton, Pa.  
W4HK, Henry L. Kitts, Knoxville, Tenn.  
W4OB, Patrick H. Wall, Tampa, Fla.  
W5DM, Cleo H. Vannoy, Denton, Texas  
W6EQM, Walter W. Matney, Tujunga, Calif.  
W6ILS, Mervyn W. Wessenberg, San Francisco, Calif.  
W6PW, John L. Stevens, San Francisco, Calif.  
W6ZYI, Ernest T. Oftedahl, San Francisco, Calif.  
W7NWX, Jack Kellogg, Walla Walla, Wash.  
W8DMP, Ernest L. Nelson, Detroit, Mich.  
W9CSQ, Herbert G. Crome, Chicago, Ill.  
W0CWW, Charles A. Pine, Overland Park, Kan.  
W0NGX, James E. Boswell, jr., Lebanon, Mo.  
VE3AP, Arthur M. Ford, Ottawa  
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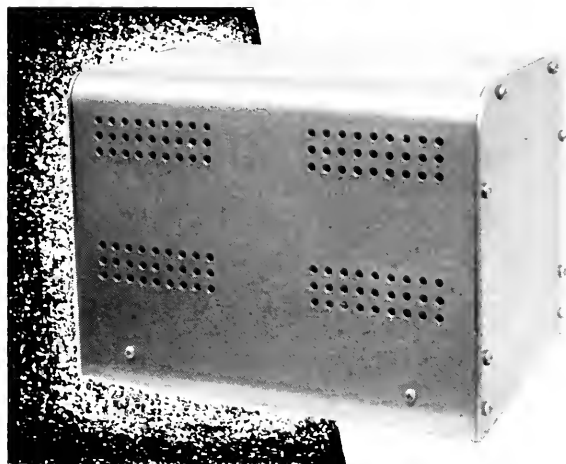
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5" W x 5" H x 7" D Grey Hammertone finish

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**PREFECT MFG. CO.,** 102 WESTPORT AVE., NORWALK, CONN.

## World Above 50 Mc.

(Continued from page 62)

**W5FPB, Albuquerque, N. Mex.** — Totaling 1954 v.h.f. activity shows 338 contacts with 45 different stations on 144 Mc., and 10 contacts with three stations on 432 Mc. With at least 45 stations available, there should be better attendance on weekly net meetings. All locals are asked to try to be active on 146.8 Mc. each Tuesday at 1930.

**W6NDR, Napa, Calif.** — WLSC reports conversion of 522 to 220 Mc., using the new 6524 in the output stage. Delivers considerably more output than with 832A.

**W7JHX, Port Orchard, Wash.** — Built phase-modulation exciter described by W1VLH in August, 1954, QST, and f.m. adapter for receiver. Checks with W7UVH, Olympia, who also has one of the exciters, show excellent results in comparison with a.m. Activity in V.H.F. SS best ever, but some scores low because of polarization problem. Switch to horizontal getting under way in Puget Sound area.

**W7JRG, Billings, Mont.** — 50-Mc. band open to W6 for at least three hours Jan. 29th. Heard W6s BWG KQO ABN NLZ and ILW. Abandoning s.s.b. on 50 Mc. after two years because of lack of favorable results. Too many operators on 6 do not recognize s.s.b. for what it is, and therefore make no attempt to tune it in properly. Inserted carrier method inefficient. Will be back on with a.m. rig essentially the same power as used so successfully from Sheridan, Wyo., some years back.

**W8WRN, Columbus, Ohio** — New stations coming on 144 Mc. all the time. New activity in Zanesville reported by W8JWV, and in Chillicothe by W8CSN. Interest in 220 Mc. also improving, with W8LGI and W8WRN looking for skeds on that band.

**W9DRN, Des Plaines, Ill.** — Had first crystal-controlled QSO on 432 Mc. Jan. 31st, after completing crystal-controlled converter. Uses 6AN4 r.f. stage, 6AM4 grounded-grid mixer, 6BK7 50-Mc. i.f. amplifier, into S-36. Transmitter uses 4X150A doubler from 220-Mc. rig, with frequency of latter brought down to 216 Mc. Work W9AGM, Chicago, regularly. W9ZQT and W9EFD also on 432 Mc.

**W9KQK, Elmhurst, Ill.** — Experimenting with 6AJ, F, M, and N4 tubes on 1215 Mc.

**W0QMF, Perryville, Mo.** — W0s LMK DFK RUF RTO QMF, and W9s PMN and KH in process of organizing 2-meter net. Also experimenting with duplex operation.

## ~~W~~ Strays

When W5QNK broke in on W5FAO and W5RRL on 75 meters, it became a real Baptist pastor's conference. W5QNK is pastor of the First Baptist Church, Chelsea, Okla.; W5FAO is pastor of the First Baptist Church, Vernon, Tex.; and W5RRL is pastor of the East Paris Baptist Church, Paris, Tex.

— — —

When W6HSZ goes on the air, strange things happen to his bath tub. It seems that it resonates around 75 meters. Whenever he's on 'phone with his kw., the bather, if there is one at the time, gets the surprise of a lifetime! More than once his signals have been modulated by a feminine scream. He plans to let the BTI (bath tub interference) stay as is — too much fun! — **K6BSW**

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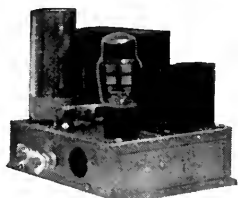
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Model 6A  
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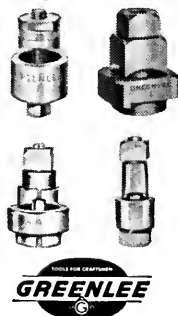
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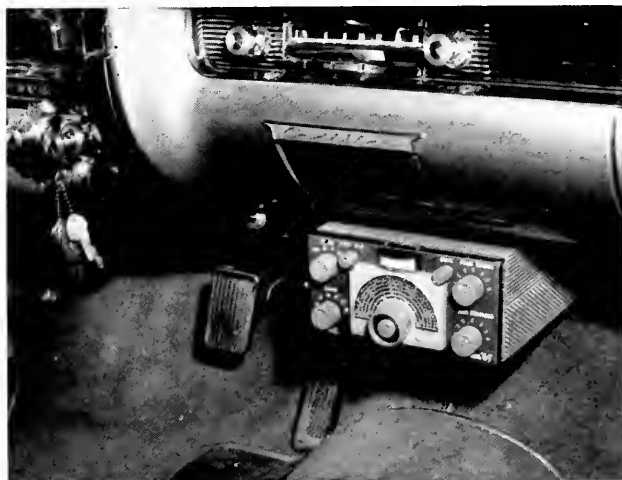
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65 W—Phone,  
90 W—CW



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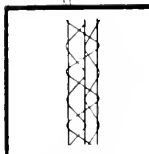
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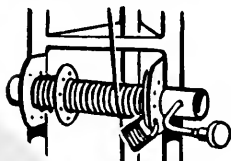
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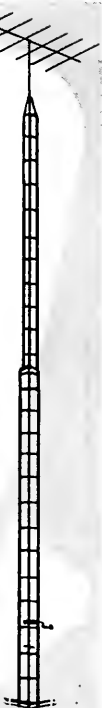
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## YL News & Views

(Continued from page 55)

### Keeping Up with the Girls

W1WPO of Hq. adds the call of W2FZO to the list of YLs who are DXCC, published in our February column; Ginger has 100 on 'phone. . . . Each YL who has a bona fide QSO with K2BBW's OM, W2QAI, receives a real mink's foot along with Dave's QSL. . . . The new QTH of the YLRL chairman of the Sixth district, W6WSV, Carol, is 6852 Claire Ave., Reseda, Calif. . . . SCM for Eastern Mass., W1ALP, reports two new Novices: WN1DQF, Alice Perry, and WN1DRP, Phyllis Smith, XYLs of W1s BB and UOC respectively. . . . The new call of ex-W0YHD, Jenny, is K6JCL. . . . K6EXV, Lucille, K6HJZ, Jessie, and W9LAS, Rose, are now General Class. . . . VE2HI, Ethel, is a director of the Montreal A.R.C. . . . W9OTM's marriage to W9ODS raised the number of hams in June's family to five — mother is W9OTO, dad is W9OWD, and brother is W9MEM. . . . W9QMA, Dot, announces the arrival of a new harmonic in December. . . . New officers of the Long Island unit of YLRL are KN2EBU, pres.; W2KAE, V.P.; K2CFF, Secy.-Treas.; W2s KDP, UXM and KN2JHQ, board members. . . . New officers of the N. Y. C. YLRL Club are: Pres., W2IQP (relected); W2IGA, V.P.; W2MIV, Secy., Helen Zuparn, Treas. . . . W6QYL, Martha, home from an extended stay in the hospital, is operating 75 'phone from her bedside. . . . OM W6SXX/MM, aboard the liner *Hawaiian Rancher*, in the Port of Los Angeles for one week, worked sufficient YLs (10) to earn his Lads & Lassies Certificate from the L.A. YLRC. . . . W9LOY, Cris, reports the acceptance of new LARK members: W8ATB, W9s KFC, LDK; WN9IWP; W0LHP. . . . K6ANG, Billie, was elected Secy.-Treas. of the L.A. Council of Radio Clubs. . . . W6NAZ, Lenore, is editing a new YLRL directory, which will contain pertinent information about all YLRL members. Copies will be ready for distribution in April, and may be obtained by sending one dollar per copy to W6DXI, Gladys Eastman, 735 Glen Ave., Glendale 6, Calif. . . . W6QPI, Betty Gillies, is general chairman of the Ninth Annual All-Woman Transcontinental Air Race to be held in July. W1UKR, Eunice, is general radio chairman, with W2JZX, Vi, assisting. W6NZP, Evelyn, is radio chairman for Long Beach, Calif. . . . We were sorry to learn of the passing of W1UPZ, Helen M. Wright, Brookline, Mass., in January. . . . On Feb. 12th, 75 YLs and OMs enjoyed the annual YL-OM Valentine dinner banquet sponsored by the L.A. YLRC. Guests included VE3TEW, Ethel, and OM VE3TW; W9YWH, Evelyn; OM VK2US and family; and ARRL Southwestern Division Director Joos, W6PJU, Mildred, presided. . . . W6LBO, Mary, reports the following chairmen and committee members, in addition to those already reported, for the first YLRL International Convention: decorations, W6MFP; finance, W6NZP; program, W6QGX; prizes, W6KYZ; Sunday picnic, W6WSV and K6EIA; housing, W6JZA and K6ANG; favors, W6QYL, W6DXI, K6GMX, KN6EJE.

### HAMFEST CALENDAR

CONNECTICUT — The Tri-City Radio Council will hold its eleventh annual hamfest at the Crocker House, New London, on April 16th — attendance by advance reservation only, \$3.75. R. Y. Chapman, W1QV, General Chairman.

MINNESOTA — The Southwestern Minnesota Radio Club will have a dinner and a program featuring talks and demonstrations on April 30th, 6:30 p.m., at the Minnesota Cafe and J. C. Hall, in Marshall.

NEW JERSEY — The tenth annual Old Timers' Nite Round-Up and Banquet, sponsored by the Delaware Valley Radio Association, April 23rd, in the grand ballroom of the Stacy-Trent Hotel, downtown Trenton. Dinner served promptly at 6:30 in the ballroom. Tickets by reservation only, \$5.00. General Chairman, E. G. Raser, W2ZI.

PENNSYLVANIA — April 16, the Arcadia Cafe, 27 West Orange St., Lancaster, the 10th annual banquet of the Lancaster Radio Transmitting Society. Activities start at 2 p.m. with contests and entertainment for the OMs, YLs, and XYLs. Dinner at 6:30. Registrations are in advance and may be obtained from A. C. Jacoby, W3OY, 589 No. Plum St., Lancaster.



# add POWER to S.S.B. with adams

Have you heard WOHN - W2JXH - W2DR - W9ARK - KV4BB - W4UEL? These are some of the stations on the air with 55B - "adams" 55B Listen to these fine signals on the air and you will buy an "adams" Final. Here are the specs. — Compare.

## adams 1010 - 1 kw

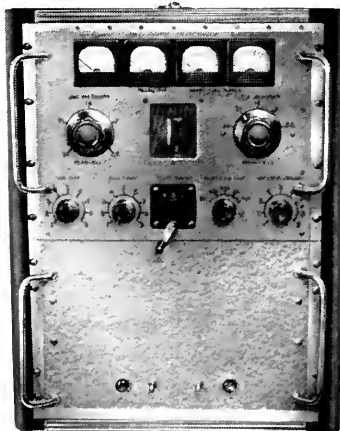
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The low-power driving requirements of the 4-400A tube class AB1 lends itself admirably for use with exciters of 4 to 5 watts output.

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Price: 1010-KW Linear Amplifier  
\$875.00  
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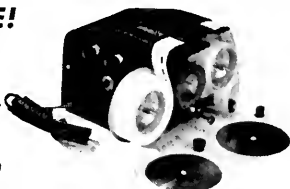
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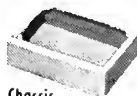
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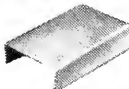
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## Electronic-Key Manipulator

(Continued from page 35)

ease of operating, while still simple and within the ability of the average amateur to build. The design arrived at is presented here, and after some experimenting with the completed key for the correct adjustment, this design has stood up for a couple of years now.

An Army surplus Model J-36 key is the basis for the key built here. When revamping this model Vibroplex the staff support structure was turned 180 degrees from its original position. Two new holes were drilled in the base to match the mounting holes. Two more holes were drilled at the opposite end to mount the posts for the dot and dash contacts. As a rule some  $\frac{3}{8}$ -inch stock can be found in the shack and posts made as required. These two posts are insulated from the base and wires are connected to them. The third or common wire is connected at the mounting screw of the staff support structure. Be sure that the resistance checks at infinity on an ohmmeter or trouble may result in the time-constant circuits of the electronic key. The three wires are connected to a microphone plug.

The arm or reed is cut from a piece of duralumin. It is stiff and springy — the sort used in aircraft construction and obtainable from a war-surplus store. Do not use soft aluminum as it is too easily bent. A steel reed will be too heavy and will cause undue vibration, since the reed has to be highly damped; for the same reason, keep the weight to a minimum at both ends.

On the contact end a small hole is drilled to match the contact posts and a piece of silver or contact material is forced or wedged in and left extending a bit to ensure a good contact at the points. The hole for the staff is drilled a thousandth smaller and the staff is pressed in. If a drill press is available, the following is a method of assuring a good fit: Clamp the reed in the drill press vise and with a drill ten thousandths smaller than the finished hole drill with a fast speed and easy feed. Every  $\frac{1}{8}$  inch or so withdraw the drill and clean off the chips. Use a thread-cutting oil if possible. After the first hole is drilled, redrill with the finish drill. Leave the reed in the drill press vise and chuck the staff in the drill press; then press the staff in to the desired depth. A good hardware store will be glad to measure the staff with a micrometer and furnish drills of the right size. Also, while at the hardware store, buy a  $\frac{1}{8}$ -inch center drill and use it to true up the tapered bearings of the

(Continued on page 148)

## QUARTZ CRYSTALS

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Low Frequency — FT-241A for SSB, Lattice Filter etc., .093" Pins, .486" SPC, marked in Channel Nos. 0 to 79, 54th Harmonic and 270 to 389, 12nd Harmonic. Listed below by Fundamental Frequencies, fractions omitted.

49¢ each — 10 for \$4.00	99¢ each — 10 for \$8.00
370 393 414 436 498 520	400 459
372 394 415 437 501 522	440 461
374 395 416 438 502 523	441 462
375 396 418 481 503 525	442 463
376 397 419 483 504 526	444 464
377 398 420 484 505 527	445 465
379 401 422 485 506 529	446 466
380 402 423 486 507 530	447 468
381 403 424 487 508 531	448 469
383 404 425 488 509 533	450 470
384 405 426 490 511 534	451 472
385 406 427 491 512 536	452 473
386 407 429 492 513 537	453 474
387 408 430 493 514 538	454 475
388 409 431 494 515 539	455 476
390 411 433 496 516 540	456 477
391 412 434 497 517 541	457 479
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99¢ each — 10 for only \$8.00

CR-1A SCR 522- $\frac{1}{2}$ " Pin, $\frac{1}{2}$ " SP	FT-171B — BC-610 Banana Plugs, $\frac{1}{2}$ " SPC
5910 7350	2030 2220 2360 3202 3850
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6450 7390	2065 2260 2415 3237 3955
6470 7480	2082 2282 2435 3250 3995
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6522 7810	2125 2300 2532 3510
6547 7930	2145 2305 2545 3520
6610	2155 2320 2557 3550

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**AUTOMATIC CODE PRACTICE**  
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**LATOR.** 115 or 230 V @ 50-60 cycles.  
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Variable speed from 5 to 25 w.p.m. Uses ink-  
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4330 5700 6273 6850 7641 7940	
4397 5706 6275 6875 7650 7950	
4490 5725 6300 6900 7673 7973	
4495 5940 6325 6925 7675 7975	
4535 5750 6350 6950 7700 8260	
4735 5773 6373 6975 7706 8273	
4840 5780 6375 7450 7725 8275	
4930 5806 6400 7473 7740 8300	
4950 5840 6406 7475 7750 8325	
4980 5852 6425 7500 7773 8630	
5030 5873 6673 7506 7775 8683	
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3955 6473 7050 7375 8200 8650	
3990 6475 7073 7400 8340 8700	
6000 6500 7075 7425 8350 8730	
6025 6506 7100 7440 8380	
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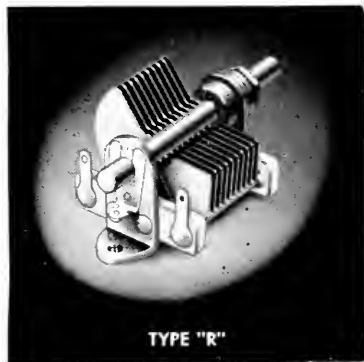


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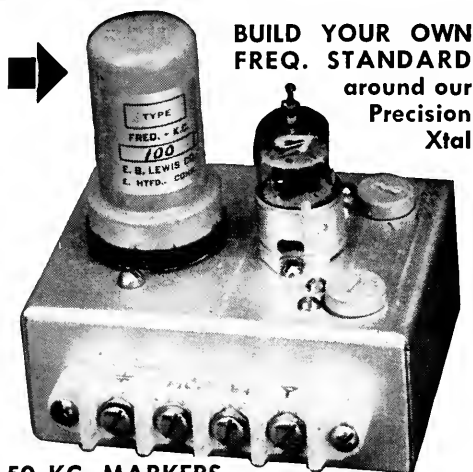
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support. Also true the staff bearing surfaces if worn. Sloppy motion must be kept to a minimum, because tolerances are close.

The springs which act against the reed were purchased in an auto parts store and although they are only about  $\frac{1}{8}$  inch in diameter they are very stiff and it is difficult to compress them between your fingers. Buy the stiffest spring possible in that size.

We are all different in our individual tastes, so thought has been given to meet as many fists as possible. The present design, I feel, will meet the requirements of a fast operator with a light touch. A slower operator or a person with a heavy hand who likes a lot of swing will need to move the two spring-supporting posts about  $\frac{3}{8}$  inch nearer the fulcrum of the key, as well as to use a spring of lighter tension. However, between the two positions and different springs I believe most conditions can be reached. The contacts as shown can be adjusted to a very few thousandths of an inch and the paddle only requires a whisper to move, but still the reed will center each time with no vibration.

The two adjusting screws near the paddle are there for the sole purpose of preventing damage to the reed from a person who has a heavy touch, or takes his wrath out on the bug instead of himself. As *QST* mentioned, adapt yourself to the bug and let it set the pace — you will never make it otherwise.

## Correspondence

(Continued from page 52)

entitled *Historic Towns of the Connecticut River Valley*, published in 1906. I ventured no further than page 7 which discussed the five Indian tribes of the Connecticut Valley, one of which was the Podunk tribe situated at what is now East Hartford. A very enlightening discussion, I felt, and a very subtle explanation of the "Podunk Hollow Radio Club."

Hats off to all of you of the "Hollow" (despite your being in West Hartford) for your knowledge of Connecticut history — and to Gil for his portrayal of the club.

— Jim Talbut, WN3ZLD

## DX RCC

1223 Ninth Ave., South  
Escanaba, Mich.

Editor, *QST*:

With regard to "Tips on Working DX" in the February issue, I should like to voice a small objection — in part. I realize that rare DX should be treated accordingly and all lengthy QSOs ought to be eliminated so that as many as possible may benefit from working the particular station.

However, in general, DX contacts can often contribute greatly to the amateur in many important ways if longer rag-chewing is made possible through favorable conditions, etc. The promotion of international goodwill and the exchange of common knowledge, operating and construction hints, everyday comment about topics of mutual interest, all provide one of the most rewarding aspects of amateur radio. Our DX contest is the time for the quickest QSOs, of course, and I am convinced that at other times, when possible, a more extended, friendly contact will be of great benefit to both parties concerned.

As a high-school instructor of social science, I have derived considerable value through the interchange of ideas and concepts through the medium of amateur radio, and lately have become very much aware of the possibilities on a truly international scale.

— Donald W. Ickes, W8NSX

(Continued on page 150)

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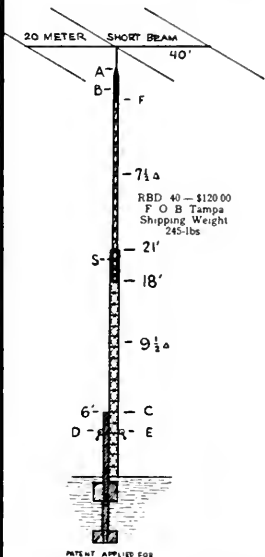
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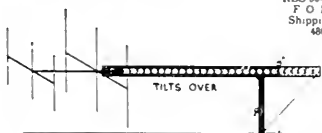
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PHONE 4-3916

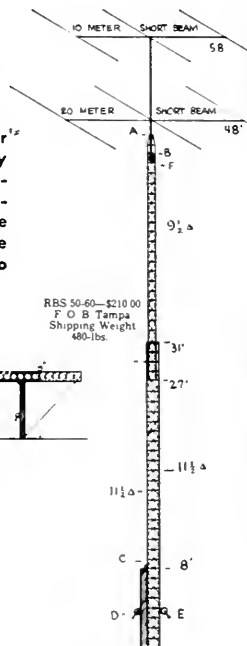


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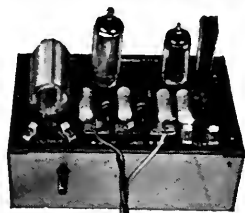
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## NEW EXAM

East Main Street  
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Editor, QST:

The following is suggested as a 1957 amateur license examination, if the present trend in FCC policy continues to its logical conclusion:

CODE: A dot plus a dash equals "A" ( ) Yes ( ) No  
LAW: You must have a license before you transmit.

( ) Yes ( ) No

THEORY: Ohms and volts are different ( ) Yes ( ) No

PRACTICAL: Do you have \$2500 to invest in a factory-built rig? ( ) Yes ( ) No

Do you intend to have an electrician install this rig? ( ) Yes ( ) No

If the answers to the above questions are "yes," what call do you want? Please give second choice.

— Harold S. Davis, W8EOY

## NO RECIPROCITY

233 Appleton St.  
Lowell, Mass.

Editor, QST:

Most of us hams eagerly devour a QST yarn spun by that Prince of Hamdom, the DX-peditioneer, who, though the W pile-ups were rougher than a stucco bathtub, endeared himself more than somewhat to the DX fanciers among us by his generous provision of wall insulation.

If verbose, he will majestically expound on all subjects from how his rig loaded to the exotic native remedy for snakebite and how to obtain same.

Certainly though he will explain how he came to be there. Disregarding his personal problems and those of transport, we read that some beneficent foreign authority gave him permission to operate.

As we avidly read his tale does it occur to us that under our present ham regulations the turnabout which is fair play simply cannot occur? We find that, except in the case of Canadian hams, operation is barred to all but citizens.

Among us there must reside scores, if not hundreds, of responsible businessmen, students and scientists, whose keys are gathering rust because of these one-sided regulations. The "Passport Ham" suffers but these provisions handicap us also in negotiations for permission to fire up on foreign soil.

Contrary arguments based on "security reasons" are not valid as with proper screening our present leaky security net would not be enlarged in gauge.

"Send me your hungry, your stormtossed, your huddled masses, etc." does not seem to apply to the case of the visiting ham.

— John L. Gilbo, W1SSZ

## QRP MOVEMENT

St. Bride's Presbytery  
Cowdenbeath, Fifeshire  
Scotland

Editor, QST:

I wonder if the ARRL would be prepared to initiate a QRP movement amongst hams. When we look at conditions on the ham bands today, it seems to me that it will only be by a return to (say) a maximum of 150 watts that order is going to be restored.

If some of the W stations had their QTH here in G-land and could listen to the 14-Mc. band when the DL4 stations are in full swing with their BC-610s and ET-4336s, they would see my point of view. To overcome these, some of the Continentals are jacking up their power, and the result is sheer bedlam. My present reaction is to trade in my equipment for a camera or butterfly-catching equipment since DX work is out of the question with high-powered DLs and high-powered (and often badly modulated) Continentals. What will happen if the 1-kw. transmitter ever becomes standard equipment. Well, my imagination boggles at the thought. When chasing the DX, could not such stations reduce power and thereby show some consideration for those whose power is limited by law?

To me, this tendency to increase power will eventually destroy the true amateur spirit. Instead of a real DXer, experimenting and building his own, in a few years' time he'll be forced to spend, e.g., \$3850.00 for a 1-kw. transmitter and \$1075.00 for his receiver. If he cannot afford to

(Continued on page 152)

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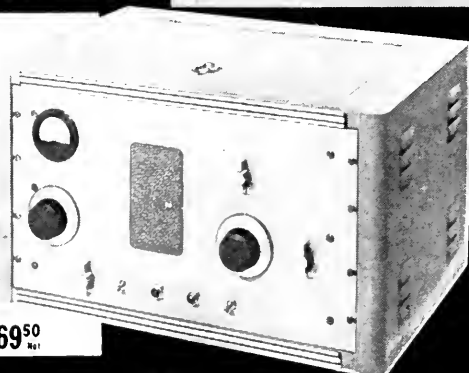
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do so, he can kiss the DX good-by. And how many hams can afford to spend \$5000 on their rigs?

Please do not think that this is an isolated opinion; there are many who think as I do. This opinion is not to be regarded as just another example of anti-American feeling in Britain.

— Rev. S. J. Smith

### SWL REPORT

Union & Stony Point Rd.  
Rochester 11, New York

Editor, QST:

Last year I received over 500 SWL cards. Other stations with greater operating hours have accumulated a greater total than this. I do not disapprove of this practice but wish to encourage the reporting in the right direction.

The average SWL, and future amateur, picks out easily readable signals within the popular 'phone bands and sends a card. The operator at the other end is well aware that he is getting out both through actual contacts and the deluge of SWL cards. Why doesn't the short-wave listener dig down under and pick out the weak signals? Likewise, as a potential amateur, he should spend time listening in the c.w. bands.

The low-power 'phone or c.w. station will appreciate that SWL card far more than one of the high-power boys and the chance of receiving a reply is far greater.

— B. Kelley, W2ICE

### Receiver Hints for V.H.F.

(Continued from page 37)

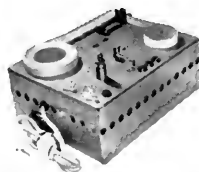
approximate that of the bandspread dial. On most receivers this gadget is helpful for applications in addition to use with v.h.f. converters. It makes fishing for stations outside the ham bands more enjoyable, and it preserves the calibration of the general-coverage dial, which is upset if the bandspread dial is used as a vernier.

How badly a receiver needs such an accessory depends on several factors. One is the number of positions on the bandswitch; in other words how much frequency is covered on each tuning range. The small inexpensive receivers generally have four bands. They *require* the vernier mechanism. Some have five positions, but a fast tuning rate. They need it, too. Several medium-priced receivers have five positions and a good tuning rate. They benefit from the vernier drive, but they *can* be tuned accurately without it. The NC-173 and 183D are in this category. A few receivers have six bands. The HQ-140-X and SX-88 are two we've tried that tune quite well without vernier attachments. On Band 4 both receivers cover just a little more than 6 to 10 Mc. If the converter crystal frequencies are altered slightly from *Handbook* specifications, you have coverage of a band with a full sweep of the general-coverage dial.

Any planetary drive can be used. The National Velvet Vernier is one we've used several times. A mounting for the Type AM is shown in the second photograph. This gives the same tuning rate as the Croname type 599, but the latter has the advantage of permitting either direct drive or 5-to-1 reduction. The knob assembly supplied by the manufacturer can be used, but we prefer something larger. The lash-up shown in the first photograph was made by drilling out the center of a National HRT knob to pass the direct-drive portion of the 599 shaft. The knob on the vernier-drive shaft is a National type HRT-M. Many other combinations can be made up to take care of individual tastes or available parts stocks.

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You get plenty of cipher groups that you will never memorize. Speed up to 25 words is child's play with TELEPLEX. Forty to fifty words certainly is within reason.

*Send postcard for brochure describing MASTER TELEPLEX, the only Code Teacher that records your own signals so that you can see and hear just how you make your signals. (See it at Blan's, 64 Dey St., New York.)*

**NOVICE SPECIAL** with 16 Lessons \$15.95 prepaid. Built-in oscillator with radio tube \$6.00 extra. Complete oscillator kit with tube; you wire it up \$4.00 (Oscillator or kit not sold separately.) Get it from your dealer or order direct. State your present code speed if any.

**TELEPLEX CO.** 415 G. Street  
Modesto, California

## ULTIMATE KEYER

Manufacturing rights under U. S. Pat. No. 2,658,946 now available. Assignment considered. See patent for application to tape transmission. Contact **John Kaye**, 2296 W. Nicolet St., Banning, Calif. or Berkeley & Scantlebury, 530 W. Sixth St., Los Angeles 14, Calif.



## THE LEAGUE EMBLEM

With both gold border and lettering, and with black enamel background, is available in either pin (with safety clasp) or screw-back button type. In addition, there are special colors for Communications Department appointees.

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**THE EMBLEM CUT:** A mounted printing electrotpe,  $\frac{5}{8}$ " high, for use by members on amateur printed matter, letterheads, cards, etc.

\$1.00 Each, Postpaid

## AMERICAN RADIO RELAY LEAGUE

West Hartford 7, Connecticut

## RADIO OPERATORS

Licensed operators with minimum 2 years' marine or ground station experience.

## RADIO, VHF TECHNICIANS

Minimum 5 years' experience maintaining and installing standard commercial radio and VHF communications equipment.

### For work in Saudi Arabia

*Write* giving full particulars regarding personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 6

## ARABIAN AMERICAN OIL COMPANY

505 Park Avenue, New York 22, N. Y.

## NEW HAM FAVORITE

Hallicrafters model SX-99 with smart new styling is feature packed to make this model outstanding in its price range. **COVERAGE:** Broadcast Band 540 - 1680 kc plus three short wave bands covers 1680 kc - 34 Mc. **FEATURES:** Over 1000° of calibrated bandspread over the 10, 11, 15, 20, 40 and 80 meter amateur bands on easy to read dial. Separate bandspread tuning condenser, crystal filter, antenna trimmer, "S" Meter, one r-f, two i-f stages, plus all new styling.



**MODEL SX-99 (Less speaker) ... \$149.95**  
**MODEL R-46A Speaker ... 19.95**

All prices  
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**WALDER RADIO & APPLIANCE CO.**

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**HAM SPECIAL**  
\*813 Tubes **\$200** each  
GUARANTEED

# HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature, and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1) (2) and (5), apply to all advertising in this column regardless of which rate may apply. To expedite handling of your copy please state whether you are a member of ARRL.

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(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

*Having made no investigation of the advertisers in the classified columns, the publishers of QSL are unable to vouch for their integrity or for the grade or character of the products or services advertised.*

**QUARTZ**—Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

**MOTOROLA** used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

**SUBSCRIPTIONS.** Radio publications. Latest Call Books, \$3.50. Mrs. Earl Mead, Huntley, Montana.

**WANTED:** Cash or trade, fixed frequency receivers 28/42 Mc. W9YIX, Troy, Ill.

**WANTED:** All types of aircraft radios, receivers and transmitters. Absolutely top prices. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

**WANTED:** Early wireless gear, books, magazines and catalogs. Send description and prices. W6GHI, 1010 Monte Drive, Santa Barbara, Calif.

**CODE slow?** Try new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

**URGENTLY** need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

**WANTED:** ART-13 transmitters. Write James S. Spivey, Inc., 4908 Hampden Lane, Washington 14, D. C.

**OUTSTANDING** ham list always. Our prices on trade-ins of all amateur brands are realistic and down to earth. We feature Johnson, National, Collins, Hallicrafters, Gonset, Elmac, Harvey-Wells, Morrow, Central Electronics and other leaders. We trade easy and offer our own time-payment plan tailored to fit you. All leading brands of new equipment always in stock. Write today for latest bulletin, Stan Burghardt, W0BJV, Burghardt Radio Supply, Inc., Box 41, Watertown, S. Dak.

**DON'T** Fail! Check yourself with an up-to-date, time-tested "Sure-check Test." Notice, \$1.50; General, \$1.75; Amateur Extra, \$2.00. Amateur Radio, 1013 Seventh Ave., Worthington, Minn.

**ANTENNA** for bandswitching transmitters up to 300 watts input, approx. 120 feet long, centered with 75-ohm line, 70 feet included, low SWR, tunes 80-40-20-10 meter bands. U. S. Patent 2,535,298. Each costed for resonance on all bands. Send stamp for details. \$18.95 each. Lattin Radio Laboratories, 1431 Sweeney St., Owensboro, Ky.

**NEED ART-13.** R. Ritter, 4908 Hampden Lane, Bethesda, Maryland.

**WANTED:** Bargains in transmitters, receivers, laboratory and test equipment, also miscellaneous and unusual gear, etc. What have you? Please state price desired. Especially interested in husky power supplies, large filter chokes and condensers, etc. Also need plate transformers putting out about 4,000 V or more each side center. Harold Schonwald, W5ZZ, 718 North Broadway, Oklahoma City 2, Oklahoma.

**FREE Bargain Bulletin.** Visit store for thousands of unadvertised bargains. New BC610 tuning units TU-47, TU-48, TU-49, TU-50, TU-51, TU-52, \$5.95 each. Surplus RG-8/U cable, 100 ft., \$5.95; 250 ft., \$13.25, 500 ft., \$25.00. Selsyns, 110 volt size 5, \$12.95 or 1000 Kc standard crystals, \$2.95. Wanted: Surplus radio equipment, Navy synchros. Lectronic Research Laboratories, 719 Arch St., Phila., Penna.

**WANT:** Johnson rotator. Sell television receiver, \$30. W4AI'I, 1420 South Randolph St., Arlington, Va.

**CASH** for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallicrafters, Hammarlund, Johnson, Lyco, Master Mobile, Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

**QSLs?? SWLS??** Largest variety samples 25¢ (refunded). "Rus" Sakkars, W8DED, P. O. Box 218, Holland, Michigan.

**QSTS:** 280 issues—1922-1950, \$100, with covers. Stamp for list. Bud Centry, W5VIM, 428 Maple, Richardson, Texas.

**QSL-SWLS** Meade W0KKL, 1507 Central Avenue, Kansas City, Kans.

**QSL-SWLS.** 100, \$2.85 and up. Samples 10¢. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

**QSLs, SWLS.** America's Finest!!! Samples 10¢. C. Fritz, 1213 Briar-gate, Joliet, Ill.

**QSLs, SWLS.** Fair prices for excellent quality cards. Eleven styles for you to choose from. Samples, 10¢. Almar Printing Service, 423 Barker Bldg., Omaha, Nebraska.

**DELUXE QSLs.** Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

**QSL-SWLS.** Samples, free. Bartoski, W1YHD, Williamstone, N. J.

**QSLs.** Samples free. Albertson, W4HUD, Box 322, High Point, N. C.

**QSLs!** Two colors, \$2.00 hundred. Samples for stamp. Rosedale Press, Box 164, Asher Station, Little Rock, Ark.

**QSL "Brownie,"** W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

**QSLs!** Taprint, Union, Mississippi.

**QSL-SWL** cards, Sensational offer, Bristol stock 500 1 color \$3.95, 2 color \$4.95, 3 color \$5.95. Super gloss \$1.25 extra. Rainbow cards. Samples. QSL Press, Box 71, Passaic, N. J.

**QSL** samples. Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

**QSLs.** Postcard brings samples. Fred Leyden, WINZJ, 454 Proctor Ave., Revere 51, Mass.

**QSL-SWLS,** as low as \$1.50 per color. Samples dime. Stronberg, P. O. Box 151, Highland Station, Springfield, Mass.

**QSL-SWLS.** Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

**QSL-SWLS,** samples free. Backus, 5318 Walker Ave., Richmond, Va.

**FLUORESCENT QSL-SWL** cards. Samples 10¢. Kimball, 1545 Vine, Denver, Colorado.

**QSLs.** Nice designs. Samples. Besesparis, W3QCC, 207 S. Balliet St., Frackville, Pa.

**QSLs!** Exotic colors and designs; 2 days service. \$3.85 for 100. Satisfaction guaranteed. Be surprised! Constantine Press, Bladensburg, Md.

**FINE** quality QSLs, 100, \$2.75. Oscar Craig, Newark, Arkansas.

**QSLs:** 10% discount to back-logging eager beavers. 15 samples, "Super-Speed Specials," 10¢. Robinson, W9AYH, 12811 Sacramento, Blue Island, Ill.

**QSL-SWLS.** Rainbows, Cartoons, others. Reasonable. Samples 10¢ (refunded). Joe Harms, W2JME, 225 Maple Ave., No. Plainfield, N. J.

**QSLs.** Distinctively different. Postpaid. Samples free. Dauphinee, K0JCN, Box 60009, Mar Vista 66, Calif.

**DELUXE QSLs.** M. Vincek, W2INT, 117 Center St., Clifton, N. J. Samples dime.

**QSL-SWLS:** Varicolored. They're different! Samples 10¢. J. W. Snyder, W9HIU, 113 Harrison, Jeffersonville, Ind.

**COMPLETELY** different QSLs. Samples free. Harmon, W0IUB, 5019 Gramar, Wichita, Kans.

**QSLs:** 2-color, 150 \$2.00. Samples 10¢. Bob Garra, Lehigh, Penna.

**QSLs.** Samples dime. Printer, Corwith, Iowa.

**QSLs:** New — Different — Samples 10¢. Graphic Crafts, Route 12, Ft. Wayne 8, Ind.

**BEAUTIFUL QSLs.** Samples 10¢, catalog 25¢. World Printing, 166 Barclay Ave., Clifton, N. J.

**QSLs!** Modern and futuristic designs. Samples 10¢. Tooker Press, Lakehurst, N. J.

**LOS ANGELES Hams!** For sale: 1 K.W. linear amplifier, AM, FM, SSB, c.w. custom-built. Only needs 10 watts drive. \$600. Terms, Mr. W. P. Quinn, Dunkirk 3-5054.

**SELL:** Collins kilowatt modulation transformer, conservatively rated, \$40, W6WZD.

**MOBILE** transmitter 80-40 M. xtal with Carter dynamotor, 400v. at 300 Ma. ATR inverter RSB input 6v. output 110 AC; 85 w. intermittent, \$12.00 F.O.B. San Antonio 9, Texas. Johnston, Box 6703.

**SELL:** Vibrator power supplies, Model 2606 Hampack, 6VDC to 300VDC 100 Ma., \$14; Heavy duty 5.6VDC to 420VDC 280 Ma., \$25; 6VDC to 110VAC 50W, filtered, \$17; combination 6VDC or 110VAC to 300VDC 100 Ma. and 6.3VAC, filtered, \$22; 6VDC to 110VAC 100W maximum, filtered, \$30. All commercially made, in excellent condition. Miscellaneous other supplies. BC946 broadcast receiver with 110VAC supply, \$25. F.O.B. St. Paul, Minn. W0BUO, Charlie Compton, 1011 Fairmount, St. Paul, Minn.

**UHX-10** wanted. Advise condition, coils and price, W1KJG, Box 295, Morrisville, Vt.

**SELL:** 150-watt fone & c.w. HT-9 xmitter, antenna tuner, coax relay extra \$665 and 814, low pass filter; no TVI, worked anything on the air, \$250; 60 ft. aluminum 11" square tower, new prop-pitch motor 1 to 5 rpm. Hash-filtered, indicator control box, 110 v.a.c. op. Housing mount, extra selsyns, 10-meter Workshop (52 ohm cpl) beam, 20 meter VP beam, all parts but elements, \$200; RME-45 Cal-O-Matic revr all new, Sprague 600V condensers installed, extra tubes, RME HF 20-15-10 meter converter. In excellent condition: \$155. Cash and carry. Chet Angstadt, W3NSM, R. D. #3, Fleetwood, Penna. Phone Laureldale 9-0548.

**FOR Sale:** Hallic. S77-A rcvr, in gud condx, used 2 months, \$80 cash. Write to KN2KHZ, Corsair, 53 Seymour Ave., Newark 8, N. J.

**SWAP:** Brand new Hq-140-X for HQ-129-X, plus cash. Reason: need the money. Best offer takes. K2BIB, 307 Richardson Drive, North Syracuse, N. Y.

**HAM** mobile xmitters & rcvrs, hi-fidelity equipment. Trade in your gear. Spera. 37-10, 33 St., L.I.C., N. Y.

TRADE U. S. stamp collection 90% mint catalog about \$100 PM models Beardsart album plus mint blocks singles, thousands used singles plus collection prewar Germany and Czech all for good receiver. All inquiries answered. W5D TJ, 535 Astor St., San Antonio, Texas.

WANTED: Broadcast coil sets E & F for IIR07. B. Wilenzick, 1608 Fairview, Monroe, La.

SELL: Mallory UHF converter, \$10; Millen variarm VFO, \$15; Millen exciter, \$15; enclosed deluxe 21" rack, \$8; 7 BVL coils, \$6; 2 unused 4X150As, \$25; power supply 1100/1000/500V 20 Ma. 450 volt 140 Ma., \$15; 60 watt modulator \$20; HQ-129-X, \$130. Harold Gordon, W2RLG, 48 Main St., Little Ferry, N. J.

FOR Sale: QST, RQ, RP, Radio back issues. Write for list. Clifford Storch, 5 Winfield Terrace, Great Neck, L. I., N. Y.

ANTENNAS. Put a punch in your signal the cheap, easy way! Folded dipole, open wire construction, models for all bands, \$4.95 up. For free brochure write to WFTJC, Dick Buchan, R. J. Buchan Co., P. O. Box 9, Briceylin, Minn.

RECEIVERS repaired, aligned, by competent engineers, using factory standard instruments. Collins, Hallicrafters, Hammarlund, National. Our nineteenth year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

VAN SICKLE has new models. Hallicrafters, National, Johnson and offers big trades. W9KJF, Gene Van Sickle, 1320 So. Calhoun St., Ft. Wayne 2, Ind.

BC221 AF, like new, for sale. W0MHN, 1801 Glen Moor, Denver 15, Colo.

MILLEN 90800 xmttr. Coils for 10, 20, 75. de-TV1'd, \$30. Sams Photofact, volumes 1-10 with binders. Like new, \$100. Wm. Gilley, W8VHS, 951 Mark Ave., Hamilton, Ohio.

XVL approved, the VS baby mobile antenna is beautifully chromed, only 4 ft. high. High Q, weatherproof plug-in miniature loading coils permit instant band changes. Top section resonates antenna to operating frequency. Becomes regular car whip when coil is removed. Perfect for 50-watt bandswitching transmitters. It's tiny but effective on all bands. Replaces regular coil or fender broadcast whip. Easily installed in a few minutes. Coils available 75 thru 10 meters. With all mounting hardware and one coil, \$12.95 ea. Specify band. Other coils, \$2.75 ea. W6VS, Bill Davis, 225 Cambridge Ave., Berkeley 8, Cal.

2-METER aluminum Brownie beams, \$22 and up. Write to H. W. Snyder, W3LMC, 4330 Glenmore Ave., Baltimore 6, Md.

SELL: Telrex 20-meter "Mini-Beam." Never unpacked. Make an offer. W5TBL, Joe Thomas, P.O. Box 504, Pickens, Miss.

SELL: HRO-7, in good condx, 9 coils, pwr supply, matched spkr. All offers over \$150 answered. W0JZP, Davis, 1506 Sunnyside St., Albert Lea, Minn.

SELL: Lyco Transmaster, Mod. 600; 35 watt VFO/xtal. TVI suppressed transmitter. Like new! Price \$90. Wanted: BC458, Arthur Crissey, W2KBD, Box 417, Sparta, N. J. Phone: Lake Mohawk 2141.

WILL Trade: Like new, RME-WHF152A, 2-6-10 meter converter, for Millen 90651 GDM also like new with 7 coils 1.5 to 300 Mc. G. H. Schmitz, W2M1Q, 17 Butler St., Pompton Lakes, N. J.

WANTED: Standard cabinet, about 26 inch panel space. 1250 VDC, 500 Ma. power supply; 150-200 watt MultiMatch model xfmr or complete modulator. Jack Calhoun, 301 Washington St., Camden, Tennessee.

GOING SSB? Buy an L A 400 linear amplifier. See your distributor or write to P & H Electronics, 5 North Earl Ave., Lafayette, Indiana. Briefly, you get 75-400 meter operation at medium power in a compact cabinet, complete with power supply, for the low price of \$169.95.

SUPER-PRO SP200-X with matching speaker for sale. In excellent condition; will sell for \$145, or best offer. Want 75A-1 or HRO-50. Dave Smith, K2CHS/1, The Choate School, Wallingford, Conn.

FOR Sale: Viking II, SX42, JT30 mike, Heathkit VFO, all in excellent condition. Price \$365 takes all. Wesley H. Wiley, Box 181, 69th Bomb Sqdn, Loring AFB, Me.

FOR Sale: BC312M, unconverted, never used, \$75; RCA amplifier, new coils, best offer takes; HT6, never used, Ham went into service: \$100; QSTs 1-Dec. 1932, 1-1939; 1940-1946, run in new condx, best offer: 90 Ma. Vibrapak, Hvy duty xfmr, 75 watts, 110 v., 60 cycle. Mrs. J. Jacobs. KN2KBQ, 621 East 105th St., Brooklyn 36, N. Y.

5 IN. Panoramic adaptor, \$45; VHF152A with 7 Mc. rec, \$50; Bud VFO 21 (one set of coils) \$15. Paul Schmidt, W9WPH, 9736 Reeves Ct., Franklin Park, Ill.

LYSCO 600 and Model 12 tuner, used 12 hours, and not tampered with for sale, \$70. Lash and early deal, John Moran, 90 Barrister Rd., Levittown, L. I., N. Y. LE 3-2967.

ROTARY Switch wanted from otherwise defunct Weston 665 analyzer. Donald Cameron, 1619 Milburn, Toledo, Ohio.

SELL: Proved excellent Novice transmitter. Bandswitching 75 watts on 40 and 80 shielded and filtered against TVI. 52 ohm coax output. Tough Eldico lowpass filter, \$55. W5CLK, 661 Lucas Drive, Beaumont, Texas.

600 Watt Deluxe transmitter, all band with HT-18 VFO microphone De-TV1'd. Many extras. Write to VE3AUJ, 511 Peel St., Woodstock, Ont., Can.

SELL: BC-342N & RA-20 power supply, \$55; BC-348-L converted to 110 AC, \$50; Lyco Transmaster Mod. 600, TVI suppressed, VFO, 35 watts, 160 thru 10 meters, \$90. Ray Haeusler, W8JLS, 1005 Litchfield, Bay City, Mich.

SELL: Vibroplex original DeLux and case, absolutely new, \$20. Cost \$28. W0QE0.

REAL Bargains: New and reconditioned Collins, National, Hallicrafters, Hammarlund, Johnson, Elmac, Barker & Williamson, Gonset, Morrow, Babcock, RME, Harvey-Wells, Millen, Meissner, Lyco, Sonar, Central Electronics, all others. Reconditioned \$40A, \$65; \$40B, \$79; \$75 \$129; SX-71, \$150; NC-7, \$128; HT-9, \$129; HT-129, \$180; HT-129-X, \$169; SP400X, \$259; 32V1, \$345; 32V2, \$445; 75A2, 75A3, Viking I, Viking II, Viking Ranger, HT9, NC183D, many others cheap. Shipped on approval. Easy terms. Satisfaction guaranteed. Write for free list. Henry Radio, Butler, Mo.

SELL-Trade: 5 complete 30-watt Novice xmttrs, like new, \$25 each; 5 phone and mike amplifiers, like new, 10-20 watts, \$15 each; 4 supplies: 600V, 700V, \$60V, 1000V, all 300 Ma.; 4 Johnson dual kilowatt variable condensers, No. 2000D45; 6V dynamotor, 275V, 100 Ma., \$5; 30 amp. battery charger, \$20. Need: Receiver, grid-dipper, Or? W8QKU, 2748 Meade St., Detroit 12, Mich.

HALLICRAFTERS SX-71 receiver, \$135; Pentron UT3 tape recorder, \$65; both in excellent condition. Philip Schwebler, Jr., W2ZHE, Alcovne, N. Y.

NY-NJ Hams! Selling out! Kilowatt parts, including matched xfmr's, meters, relays, B&W R components, much more. Perfect condition, Net value \$500. Sacrifice for \$175. W2GQO, Phone NYX 10 7-3496.

SALE: Eldico TRITV, 300 watts, phone/c.w. wired, month old xmttr, \$300 F.o.b. Bryan, Ohio. Delmer Carlin, 402 E. Perry, Bryan, Ohio.

HUNDREDS of ham parts, your own price. Selenium rectifiers, 50c; 3' rubber covered leads; clip one end, lug other end - 25¢. Also some QSTs, W8BS8.

FOR Sale: HRO 60 with coils A, B, C, D. Like new, in original carton: \$400. R. E. Ridenour, 839 Wildwood Parkway, Balto 29, Md.

BARGAINS: With new guarantee: R-9er, \$12.50; S-72, \$59.50; SW-54, \$35; S-38C, \$35.00; S-40B, \$79.00; Lyco 600s, \$139.00; S-27, \$99.00; SX-43, \$129.00; S-76, \$149.00; SX-71, \$179.00; SX-75 Novice transceiver, \$49.50; SX-42 \$189.00; HRO-50 \$275.00; Heath AT-1 \$27.50; HT-17, \$32.50; I-X Shifter \$49.00; Globe Trotter \$49.50; Harvey Wells DeLux \$79.00; Viking I \$209.50, Viking II \$259.00; New SS-75, \$189.00; early HT-9 \$139.00; Globe King 400B, \$359.00; 32V1, \$395.00; 32V2, \$450.00; 32V3 \$550.00. Free trial. Terms financed by Leo, W0P6Q. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

SELL: 1 Model X7018 Sylvania modulation meter and monitor. In A-1 shape, \$20.00. VE5AY, Box 128, Lancer, Sask., Canada.

FOR Sale: SX-71 receiver, in good condx. Best offer over \$130. F.o.b. James Kuiper, 521 Walnut St., Ann Arbor, Michigan.

3IDG wants CO January, March, April, June, November, December 1945, May 1946, before 1936, R 9 before April 1935; QSTs before 1924. Copy of "Calling CO" (deSoto), 95, Ramsden Road, London, S. W. 12 England.

SELL: National NC240D with speaker, \$150.00. Looks like new. W9ZDS. James H. Buck, RFD 8, Ft. Wayne, Indiana.

WANTED: Single button Universal carbon Handi-Mikes, Mod. 200A. Any condition, good or bad, working or not. W1BB.

THORDARSON T15R61 Multivolt transformer 1000 watts, 110 v. input, 5 v. 3 A. fil winding, plus 275-250-225-200-175-150 V., each side of center tap, \$5.00; Kenyon S12851 fil. xfmr 110 input; sec. 2 coils ea. 7.5 V. CT at 15 amps; \$8; UTC mod. xfmr 500 watts, 1 Mp. ratio 2.25 to 1 (ex. pr. \$800) \$25; UTC LS48 driver xfmr pr. (3250 20 or 849 grids, Pri. 1 Mp., 1000 to 2000 ohms) \$10; RCA A66 modulation monitor, \$85; variable condenser split star cap. per sec. 103 µf, 110 mm. - 350 air gap Johnson #100C D-110, 510; audio reactor T44160 15 h. ½ amp, \$10; UTC PA 238AX Varimatch dvr xfmr primary, \$5; 116 Mc coax ant. (heavy duty, new) \$20. Write for complete list. Prices F.O.B. W4EK1, Bob Goodman, 2131 Woodford Pl., Louisville, Ky.

MOTOROLA FM receiver, transmitter 147.3 Mc. with xtls, converted to 110 VAC, 900. W8BYB, 12947 Woodbine, Detroit 39, Mich.

N. R. M. Wholesale Radio, 286 Teaneck Rd., Ridgefield Park, New Jersey, HU 7-0715, for National, Gonset, B & W, Biley, Johnson, ICA, Eldico, Elmac, ARRL publications. Relays, Dow, Peterson xtls. Mail order also.

2 Meter beams; 6 element, horizontal or vertical, all seamless aluminum. \$6.95 prepaid. Wholesale Supply Co., Lunenburg, Mass.

FOR Sale: SX24 Skyridr Hallicrafters rcvr 66" transmitter cabinet, large KW power transformer, large KW choke. Several smaller. Practically complete to assemble amateur station. Condenser, tubes, coils, etc. Bought for hospitalized veteran and not used. Will inventory five or six hundred dollars. Write for inventory. D. Thursdale, W0GFR, 1610 E. 11th St., Hibbing, Minn.

SELL: BC453, Q5R Navy model, like new condx, \$12; Heath O-8 'scope, excellent condx, \$35. W2HFH, 60 Lindgren, Merrick, N. Y.

FOR Sale: WRL 400 watt cw 'phone xmttr, \$275; Bud VFO, \$25; RME HF 10-15-20 converter, \$65; NC240D with matching speaker, \$145; Millen 90810 2-6-10 transmitter, \$45. J. L. Jones, W3PEJ, 9700 Hilliard Road, Pittsburgh 37, Penna.

JOHNSON Viking II transmitter Hallicrafters S76 with matching speaker Astatic J 29 mike and a key, best offer takes all or each. Write or message W1SS. 3970 Kc. Will deliver anywhere in New England.

EICO 5 in. 'scope, BC-453, Model 25 teleprinter, other equipment and parts. Send for complete list. W. D. Thompson, W8SWZ, RFD 4, Springfield, Ohio.

CALL SIGNS - Three coil, reflectorized (glass-beaded), aluminum, 4" x 12", \$1.50 postpaid, includes mounting frame for car, rig or shack. Lackner, W0WFT, 2029 Bradley, Chicago 18, Ill.

26-New 24Gs for \$20, or 5 for \$4, postpaid. Merloni, R.D. #2, Coraopolis, Penna. W3ZDW.

HAVE complete chemistry laboratory to sell or trade for ham gear. Send for details. W9NJEQ, 124 North "E" St., Monmouth, Ill.

WANTED: HRO receiver, used, State model and coils available, working or all parts intact as left the factory. W8FXN, Mills, 405 Waggoner Rd., Reynoldsburg, Ohio.

SWAP: BC-221-AC (modulated); complete instruction, calibration books and commercially-built, regulated power supply, for Elmac AF-67 or Viking Ranger transmitter. Also consider swapping SX-71 and cash for SX-88 or 75A3, W4BBL.

FOR Sale: Collins 32V2 like new condition, \$430; H0129X receiver (less speaker) in A-1 condition: \$115.00; Gonset VFO for use with communicator, in original carton, \$45.00. Bill Harper, W9BWM, 4037 Eddy St., Chicago 41, Ill.

FOR Sale: 500 watt fone xmttr on 6 ft. open rack, G.O.-9 Navy surplus xmttr, BC459, prop pitch motor, indicator, selsyns, SX-25 and others. \$150 takes all. Come and get it. No shipping! W1WUM, 56 Nelson St., New Bedford, Mass.

FOR Sale: New 65-watt Globe Scout and new NC-125 w/spkr. \$260.00 takes both items. W1AMJ, 55 So. View St., Waterbury, Conn.

WANTED: Low or medium power TVI-proof late model factory-wired transmitter, VFO and bandswitching. Also want receiver, Matchbox, etc. All must be in like-new condition and bargain for cash. Keel, W90AK, 2106 N. 84th, Milwaukee, Wis.

75 Watt C-w. bandswitching (160-10) transmitter kit, \$59.95, 25-watter, \$19.95. Details free. Hart Industries, 467 Park, Birmingham, Michigan.

SELL: Complete modulator for 600 watt final. T240's. Varimatch xfmr, power supply, all tubes: \$100. Millen xmitter 90810 with 10 and 20 meter coils and all tubes: \$30. 455A converted to 20 meters with VR power supply, \$25. Class C final pair 810's, meters, coils for 10 and 20, \$25. All above and solid steel cabinet, racks, panels, etc.: \$175. Not TVI'd. Will not ship. W2DO, Livingston, N. J. Tel. 6-2266.

SALE: Gonset Super 6 converter, Gonset noise clipper, complete instrux. Both \$45. D. N. Lathrop, 80 Town St., Norwich, Conn.

VIKING II factory-wired, clean, \$235; S40B, new condx, \$75; Collins 3 Kc. filter for HRO or Super Pro, \$50; SX-71, \$140. Trade Viking for Collins 310B1 and \$60. Want HQ-129X in like-new condition. Cash or trade. W0BNF, Byars, Box 105, Kearney, Neb.

SELL or swap: Gonset 3-30 converter, Johnson mobile VFO, Johnson mobile xmitter (face-wired), 1 ea. 600 volt and 300 volt at 275 Ma. 6 volt Dynamos, 50A 6 volt Delco hvy duty generator with regulator, NC125 rcvr with matching spkr, husky pwr supp. 3000 volt at 550 mls with Variac control. Write Leroy Laff, WIBML, 19 Vernon Rd., Natick, Mass. Phone OLYmpic 3-8891.

GOOD used equipment: Mallory Vibrapack VP-552, \$19.95; Mallory Vibrapack VP-557, \$29.95; BC-221F, \$99.50; Hallcrafters portable, \$159.95; Gonset 3-30, \$29.95; Collins 30K, \$950; Viking II, \$27.95; Meissner EX-85, \$85. Cuccia Radio Supply, 439 Broad St., Chattanooga, Tenn. 406 Meridian, Huntsville, Ala.

SELL: BC-457 (4 to 5.3 Mc) Command xmitter adapted for use with multiphase exciters, \$16; Heathkit audio wattmeter AW-1, wired and in perfect condx, \$16.00. James M. Hartsborne, 502 Veteran's Pl., Ithaca, N. Y.

SELL: Viking II and Viking VFO, in perfect shape: \$285.00. F.o.b. Pompton Lakes, N. J. David Beckwith, W2SHC.

FOR SALE: 1 KW 'fone/c.w. xmitter, Collins 70EA-8 VFO, PP 250TH final (80-10 mtrs, \$350). Will not ship. Paul Hazella, 106 Marshall St., Syracuse 10, N. Y.

FOR SALE: HQ-129X and HT-9 TVI-suppressed, coils for 10, 20, 40 and 80: \$300.00. Henry A. Martin, W0WEU, 1323 Spruce St., Denver 8, Colo.

TELEVISION camera components wanted: Cash or swap ART-13, SX-28, 200 and 100 watt phone rigs, Pentron tape recorder, I need deflection yoke, focus and alignment coils for image Orthicon, also want sidicon or Staticon camera tube, service manuals or info on Industrial and Broadcast TV equipment. What have you? Like to contact others interested in ham TV. Ernie Marko, W2MFO/4, 1155F School Ave., Patrick Air Force Base, Fla.

WANTED: All tubes — transmitting, receiving, industrial 4X150A, 2K, 3K, 6AN5, 349A, 304TL-TH, 250TL-TH. Surplus equipment, receivers, transmitters, test equipment, tube checkers, Hickock, any condition. Will buy, sell or trade for standard or surplus. Get our "Tabogram". Your best deal is with "TAB", 111 Liberty St., New York 6, N. Y.

WANTED: APR-4, TN-19, TN-54, ART-13, CU-25, DY-12, BC-348, BC-342, BC-312, amateur receivers, BC-221, TS-173, TS-175, LM-87, other TS, AR-11, RTA-1B, APN-9, TDQ, RA-34, RA-20, H-19, 87, teletype, cash, performers, BC-610, BC-614, BC-939, 75A, 32V, ARN-7. Cash or trade for new Johnson Viking, Ranger, Barker & Williamson, National, Hammarlund, Elmac, Gonset, Teltrax, Hallcrafters, Jones Micro-Match, Harvey-Wells, Pentron, Fisher, Cornell-Dubilier, Morrow, Master Mobile. Write: Alltronics, Box 19, Boston 11, Mass. Richmond 2-0048 (Stores at 60 Spring St., Newport, R. I. and 44 Canal St., Boston, Mass.)

SELL: New and used Gonset mobile equipment. Also 2-meter and 6-meter communicators, etc. R. T. Graham, W1KTJ, Box 23, Stoneham, Mass.

FOR SALE: Mark II with all accessories; also Heathkit 30W xmitter and Comco MO-1 xmitter 60W, with mobile power supply. Sonar MR3 mobile rcvr, W3WV, King, Prince Frederick, Md.

GIVEAWAY Prices! Army surplus, new radio gear: Filter chokes, h.v.a. @ 329 Ma., 500 gram bag of SX material, \$4.88; output transformer and low pass filter, PFI 10,000 ohm. Sec. 4 ohm, pass frequency from 410 to 2000 cycles, 50¢; copper antenna wire, single strand, outdoor covering, 100 Ft. 50¢. Cash with order or C.o.d. Army Surplus Outlet, 91 N. Second, Memphis 3, Tenn.

SELL: Teletype equipment, 12,000 ohm dpt. relays, \$1.75; RAK, RAX, low frequency receivers, \$95 ea.; NC-100, \$85; NC-100A, \$100; TG-7-B Mod. #15 teletype, Ranger, wired, excell. condx. Want APR-4, TN-19, TN-54, APR-5AX, RA-20, RA-87, ART-13, ARN-7. Techn. manuals, supply catalogs. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. Richmond 2-0916.

CLOSEOUT! Jumbo refurbished callsign, \$1.50; regular size, \$1.00. Whitley, W2LPG, 133 Airside Ave., Long Branch, N. J.

BROWNING 1.7-53 mc converter, \$9.95; Eldico MR-2, \$39.95; MD-40P, \$39.95; GDO, \$19.95; Hallcrafters SX-20R, \$44.95; SX-28, \$124.95; S-38, \$44.95; RME, \$69.95; SX-42, \$179.95; SX-43, \$129.95; SX-62, \$250.00; S-72, \$49.95; S-81, \$34.95; HT-17, \$39.95; HT-18, \$69.95; Hammarlund 4-11, \$34.95, 4-20, \$44.95; Harvey-Wells APS-50, \$29.95; VFO, \$37.50; TBS-50C, \$79.95; TBS-50D \$99.95; Collins 32V1 modified, \$399.95; 32V2, \$495.00; 32V3, \$595.00; National NC-46, \$64.95; NC-57, \$69.95; NC-100X, \$75.00; NC-98, \$119.95; NC-200, \$79.95; RME, D-20, \$29.95; HT10-20, \$59.95; MC-53, \$44.95; MCH-4, \$24.95; VHF-152(A), \$49.95; Babcock M754, \$69.95; Deltronic CD-144, \$99.95; Meissner EX \$44.95. Other used items available, free list from Carl, WIBFT, Evans Radio, Concord, N. H.

WANTED: Reasonably priced HQ-129-X or similar receiver. Also am interested in a RME-70, HQ-120X. Kirkman, W0ZJH, 2444 "D", Lincoln, Neb.

NEW BD77 dynamotor: \$17.50. Trade for a 2-meter converter. Cliff Moir, Rte. 4, Bath, Me.

FOR SALE: Complete mobile set up in perfect condition: Gonset 3-30, Subraco, MT-15X transmitter, PE103, Master Mobile antenna mount and whip, best offer takes this for a quick sale. Russell Weissman, W2BRN, 82-50 210th St., Hollis, L. I., N. Y.

COLLINS complete station, like new! Tremendous savings! Sacrifice for fast action! 32V2 conversion xmitter with Collins TVI filter; 75A1 receiver with matching speaker, new Johnson Matchbox, electronic Mon-key, straight key, Cardax 950 mike, spare tubes and co-ax connectors, hot 10 and new 20 Shortbeam. Everything like new in appearance and now operating. All must go at one price for everything! F.o.b. \$575. Local price, no shipping, \$495. W2PHE, 261 Forest Ave., Glen Ridge, New Jersey, Phone Glen Ridge 7-1544.

FOR SALE: Sams Photofac, Volumes 1 through 18, complete and in like-new condx, \$250. Will deliver within 250 miles; Stancor battery eliminator, 6 volts, 12.5 amps, \$20; three VT127A, \$2 each; five each 1625 and 1626 at 45¢; one 100T11, \$9.50; two 5514, \$4.00 ea; Meck 160 transmitter, complete, best offer; three new chassis, two 10 x 17 x 3"; one 7 x 17 x 2 3/4"; \$1.50 ea. Calvin J. Evans, W9LTK, 327 W. Spring, LaGrange, Ind.

WANTED: Johnson Matchbox antenna coupler. Also Preslector in gud condx. Sam Nock, KN4SE, Box 61, Hallwood, Va.

FOR SALE: Collins 70E8A PTO used one year, \$70; 550W RCA modulation transformer, uncased, unused 1:1 ratio with extra sec for screens, \$15; mod. transformer for BC610, \$15; two new 810s, \$7 each, one new 813, \$5. W4VOX, 545 Beech, Clarksville, Tenn.

SELL Gonset 2-meter converter, \$20.95 and Johnson mobile ECO, \$25.95, in excellent condition. W3IHF, Strite, 31 No. Grant, Waynesboro, Penna.

FOR SALE: National HRO-60 rcvr. Coil sets A, B, C, D, E, F, and AC included. Freq. range: .5-30/ Mcs, B's coverage for 80, 40, 20, 15, 11 and 10 mtrs. Was purchased new Nov. '54 and is still in perfectly new condition and out less than 4 months use. Guarant. for 3 months. Will ship prepaid insured anywhere within U. S. Postal money order, telegraphic money order, check or monthly payments accepted. All inquiries answered promptly. Write, wire or 'fone: Ronald L. Cummings, W5YMB, Communications Div., U.S.S. Northampton (CLC-1), C/o Naval Operating Base, Norfolk, Va.

WANTED: Code practice tapes for TG-34-A code keyer. Philip Wil, W8HPB, Box 205, Canal Winchester, Ohio.

SELL: Sonar SRT-120P xmitter, with VFO, \$145. W2SME, 324 West 70th St., NYC.

FL8 audio filters, two for \$2.00 prepaid in USA. FT154 shock mounts for BC348, \$2.00 each; BC614 speech amplifier; BC638A frequency meter 100-156 Mc. Will trade for mobile equipment. M. D. Haines, W5QCB, 1316 S. W. Military Dr., San Antonio 4, Texas.

GONSET Tri-Band \$27.50; Master Mobile Mount ant. \$5.00; P.E. 103, \$18.00; BC459, converted, \$20; 150  $\mu$ fd dual variable \$8.00. New BAV 80TVL, \$3.00; 1VL, \$1.25; Lettine 240 xmitter, \$60. Tel. Dallas, W3VRZ, 233 W. Broad St., Tamaqua, Penna.

ELDICO TR 75-TV2 transmitter. Used less than a year, plus Eldico 40 watt modulator in matching case — assembled but never used: \$105. Heath AT1 transmitter, complete, and ready to go: \$18. Tubes for the above included. Shipped express collect. Niel Talmage, Wayfaring Road, Norwalk, Conn.

MOBILE: Home station complete. Elmac A54H dynamic mike xmitter, two power supplies PA500 matching AC for fixed station. Eicor dynamotor for car. Gonset Super Six converter, noise limiter, Web Bandspanner antenna, mount, mike, relays, condenser suppressors, etc.; 50 watts in a car or home. Like new, \$199.50. Also complete 80 meter 'phone/c.w. ARC3 station. Transmitter 65 watts, receiver, three power supplies, mike, \$50 for all. Ben Robin, W2BIG, P.O. Box 155, University Branch, Miami 46, Fla.

FOR SALE: Heathkit fone-c.w. xmitter, driver with VFO (35 watts). Also ant, coupler in A-1 condx: \$90. Dave Martin, 3295 S. Dahlia, Denver 22, Colo.

FOR SALE: 32V1 in excellent condx, with spare final tube: \$325. E. T. Pennington, W8WUH, 202 Chestnut St., Huntington, West Virginia.

WANTED: Communications receiver, used, good grade, HQ-129-X, NC183, SX42, ARR 7, etc. Give price, history, Morrissey, W0ALV, 5700 W. 28th Ave., Denver 14, Colo.

SELL: Harvey-Wells TBS-50D and power supply, \$150; Harvey-Wells VFO, \$25. All in excellent condition. Ian R. Underwood, 265 Grace Church St., Rye, N. Y.

WANTED: Tube RK20. Write Gordon C. Edwards, W4ABF, Rte. 2, Box 254, Springfield, Virginia.

SELL: Gonset-super-celver, Viking mobile, Johnson xmitter. Factory tuned all bands. Both 12 volts. \$170. J. Michane, 2436 Mountain Ave., Scotch Plains, N. J.

HAMFEST! Another Big Annual Affair for the Midwest hams, their families and friends. The Starved Rock Radio Club Hamfest, June 5, 1955. For details, see Hamfest Calendar or write W9MK5, Utica, Illinois.

WOULD like to buy, borrow or rent copy of "Two Hundred Meters & Down". Book urgently needed for school report. W9APV, 1248 Glencoe Ave., Highland Park, Ill.

COLLINS 75A1, excellent condition. Modified per W6SAI article. In original shipping carton, \$250; Collins 32V2, Gonset Triband with clipper, \$30. W8YEL, 829 N. Elizabeth, Dearborn, Mich.

PASS amateur theory exams. Check yourself with sample FCC-type questions & Novice and General class examinations. All for only \$50. Ameco Electronics, 1203 Bryant Ave., New York 59, N. Y.

SWAP men 3 1/2 x 4 1/4 Pacemaker Speed Graphic outfit, complete, also telephoto lens, etc. for an HRO60 or equal. R. Long, 933 E. Broadway, So. Boston, Mass.

MUST Go. Best offer buys 10-54P Electromatic Test Master, 60 cycle. Converted 19 Mark II tank set, 110 volt power supply with spare tubes. Also Vibroplex Deluxe Speed Key. Write X. F. Zacher, Reaume Rd., RR #1, LaSalle, Ont., Can.

WANTED: Communications receiver, I have to swap: ES500A Precision 'scope; SP-5 probes, Hickok 610A sweep gen; Mallory 12RS60 battery eliminator, Vol. 15 Rider's manual; RCA isofat transformer; Heathkit AR-2 receiver and case; Regency R-100 UHF converter; 3API tube, 7 in. TV set. F. Garove, W8UNJ, 722 Thayer St., Akron 10, Ohio.

WANTED: Gonset 3-30 converter; also 1946 ARRL Radio Amateur's Handbook. Please quote price in first letter. W7WLB, 2120 E. Grant Rd., Tucson, Ariz.

SELL: Sonar XE-10 \$12.00; McMurdo Silver wavemeter, \$4.00; W. E. handsets \$2.00; 4 x 5 Graflex F.P.A., \$3.00. Samkofsky, 264 Division Ave., Brooklyn 11, N. Y.

PORTABLE 15-watt 10 mtr. phone xmitter (crystal and mike included); (telescoping 82" ant.); 400V. Vibrapack, metered, all built into aluminum carrying case. Designed to plug into car cigarette lighter, ready transmit. Will sacrifice for \$50. W3TNX, Groff, 120 Westland Drive, Pittsburgh 17, Penna.

SELL: BC-221, new, guaranteed, \$100. Wilson, 4624 Woodfield Rd., Bethesda, Md.

FOR Sale: Heathkit transmitter AT-1, \$25; Heathkit VFO VF-1, \$15; Eldico modulator MD-40, \$30. All in gud condx. Peter G. Montague, The Choate School, Wallingford, Conn.

FOR Sale: Bandmaster Deluxe with power supply and VFO, in new condx, \$125. Complete NC57 receiver, \$55. W9KRMZ, 21 E. Brayton St., Chicago 28, Ill.

CRYSTALS: Marine, aircraft and general communications frequencies. Write for information. C-W Manufacturing Co., Box 2065, El Monte, Calif.

SELL: Heathkit transmitter, \$27.50; excellent VFO, \$24.50; MS-710 code practice oscillator, \$5.50; antenna tuner, \$3.50; clean 1939 Chevrolet for mobile use, \$150. K2BAY.

SELL Bandspread coil sets AA and AC fit late models HRO receivers, both for \$22.00. In perfect condx. W3BFF.

FOR Sale: Eico tube tester #625, with ph tube adapter, \$32; Eico condenser checker #950, \$16.50; Eico battery eliminator, #1040, \$17.50; all units factory wired, excellent. Prices f.o.b. Henry Mohr, W3NCX, 1005 Wyoming St., Allentown, Penna.

FOR Sale: Complete 1 Kw xmitter, built to commercial standards, in enclosed rack. Remote Collins 310B-1 drives pp 813's; coils for 80, 20 and 10; D-104 mike; self-contained speech amplifier and self-contained pp 805's modulator. Best cash offer as unit. W9DGM, 1636 S. Biltmore St., Indianapolis, Ind.

FOR Sale: HT-9 with coils for 80, 20, 10, \$135; Millen Variarm, \$15. W9MQO, Windom, Minn.

RUBBER Stamp with your call letters, name and address, \$1.50; stamp pad thirty-five cents. El Kay Stamps, Box 5-WT, West Toledo Station, Toledo 12, Ohio.

FOR Sale: Complete ham station 3 months old, including factory-wired Johnson Viking Ranger, Hammarlund HQ-140X, Telrex 20-meter Mini-beam, CD TR 4 rotor, mike and bug; \$450.00. Don Heller, K2JQX, 31 Joyce Rd., Tuckahoe, N. Y.

FOR Sale: Johnson Matchbox, never used! In original carton, with manual; \$38.50. Bill McFarlen, W8KJC, 1015 Lake Park, Birmingham, Mich.

SELL: Meissner 150-B transmitter. Speech amplifier included; \$130 or highest offer. Also, 3000 volts at 400 mil. pwr supply, Variac, H.V. meter, 866-A; \$75. Both units delivered within 150 miles of Boston. W1WXC, 24 Monument St., Concord, Mass.

TRADE: Lysco 600-S, guaranteed TVI suppressed, and Kodak Speed Graphic for de-TV'd Viking I, or will sell xmitter for \$100. W8SHG, Collins, 416-B Montrose Dr., South Charleston, W. Va.

SELL: QSTs, October 1939 through December 1954, complete, \$35.00 or best offer; also CQ August 1946 through December 1952, complete, except two issues; \$12.50 or best offer, all F.o.b. Merrick, N. Y. Mark Devaney, W2NQR, 61 Henry St., Merrick, L. I., N. Y.

LYSCO 600, in perfect condx; \$80. Roger Simmons, W8OZL, 338 Walnut, Ashland, Ohio.

S-76 Hallcrafters, in exc. condx; modified per Nov. '54 QST, excepting tuning dial changes. Looks like factory work. Best offer over \$100. F.o.b. Terre Haute, Ind. Arthur Drake, W9QPD, 17 Marigold Dr., Terre Haute, Ind.

COLLINS 32V3; \$595; 75A3, \$425 — both: \$995. Perfect condx. Thurston, W9BCG, Lake Forest Academy, Lake Forest, Ill.

FOR Sale: Eldico MD40P modulator, power supply, excellent; \$45.00; B & W Balun coils, wired mounted; \$5.00. Dr. L. C. Silvern, K2BNI, 16 Mountainview Ave., Albany 8, N. Y.

FOR Sale: Benox automatic bandswitching transmitter, 100 watts, fone/c.w.; also BC459 and BC455. Will swap for NC-183. Hoffman, W8ET, 366 Canterbury Road, Bay Village, Ohio.

SELL: 250-watt rig, including osc.-buffer, pr. 813s final, sp. ampl., modulator, two 1000v., and 2 low voltage pwr supplies, switching panel, 10-160 meters; \$100.00 takes all. Walt Keen, W2SGN, 37 Dewitt St., Lowville, N. Y.

FOR Sale: From estate of W5DM: HRO-60; complete KW transmitter, mobile equipment. Write to W5NW, Box 586, Odessa, Texas.

COLOSSAL — See the Hamfest notices for information on the annual "Western New York Hamfest" offered by The Rochester (N. Y.) Amateur Radio Association on Saturday, May 21st.

WANTED: Instructor for Radio, Television servicing with ham license, negro, Salary \$80 per week, split shift. Davis Trade School, 607 So. 10th St., Louisville, Ky.

ENGINEERING Degrees, E.E. major electronics earned through home study, American College of Engineering, Box 27724 (D), Hollywood 27, Calif.

VIKING II with Viking VFO, low pass filter, antenna relay, D104 mike, built-in push-to-talk, factory-wired; \$325.00. Hallcrafters SX-28 with bass reflex speaker; \$125.00; 2-element 20-meter beam, 40 ft. aluminum tower, prop pitch motor, transformer and cable; \$125.00 (or best offer). David Greene, 20 Vernon Ave., Newark 8, N. J. Tel: Essex 2-6411.

FOR Sale: Globe Champion transmitter, \$200.00; Instructograph, \$10.00; Howard receiver, \$25.00. B. J. Parisi, Box 1005, Onset, Mass.

SELL: Proceedings of the IRE: September 1947 through December 1954. Also engineering texts. Write for list, J. Woestman, 331 Leconey, Palmyra, N. J.

## Test your QRK\*

THIS little quiz is based on articles appearing in *QST* for February. How much do you remember from the issue of two months ago?

1. Signals may be monitored directly, through use of a monitone, or by use of what device?
2. A new approach to variable selectivity makes use of —.
3. What circuit can double in the final without loss of efficiency?
4. Cheap yet suitable chassis for lightweight accessories can be made from what common articles?
5. What method can be used to vary directivity of a vertical antenna system?

Some of these questions can be answered from a knowledge of radio theory; others require straight memory. Let a complete file of *QST* serve as your "memory" while it fills in your knowledge of basic principles. Why not have *QST* delivered to your door each month?

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ANSWERS: 1. A second, keyed BFO (A C.W. Man's Control Unit, page 11) 2. Two half-lattice filters and a VFO (A Variable Bandwidth Filter, page 17) 3. A push-push stage (A Three-Band Multiplier-Driver, page 20) 4. Tinned kitchenware (The Baking Pan Wavemeter, page 32) 5. Switched Phasing (A Steerable Array for 7 and 14 Mc., page 28)

### \* QRK — QST Reading Knowledge.

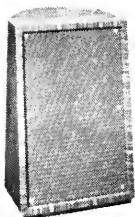
It is also the International Q-Signal meaning "Your readability is . . .". You'll find *QST* always QRK 5 — Perfectly Readable.



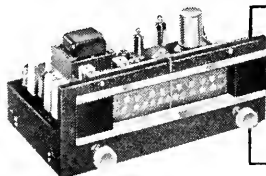
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**94 PA 159.** Net only.....\$157.95  
**93 SX 312.** Knight 12-Watt "Space Saver" Amplifier only.  
 Net only.....\$59.50



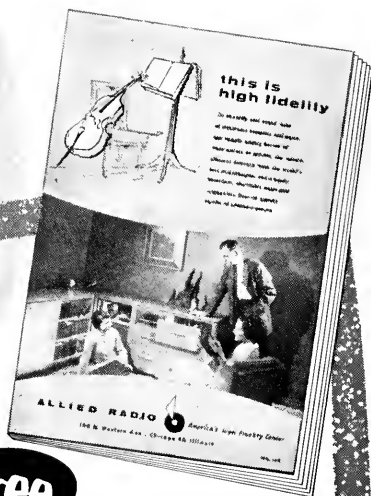
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Designed to ALLIED's highest specifications—equals the best at incomparably low cost. Maximum AM reception, thrilling on FM. Features: AFC on FM—"locks in" the station; two simple controls; sensitivity—FM, 5 mv for 20 db quieting, AM, 5 mv for 1 volt output; response, 50-15,000 cps,  $\pm 1$  db; tunes FM, 88-108 mc, AM, 530-1650 kc; output level—FM, 4 volts high imp., AM, 1 volt high imp.; hum, 60 db below output; outputs for amplifier and tape recorder; 300 ohm FM antenna input, AM, high imp. loop or antenna. Only  $5\frac{1}{2} \times 13\frac{3}{8} \times 7\frac{1}{2}$ " deep. Complete with FM-AM antenna.

**94 SX 728.** Net only.....\$89.50

**94 SX 729.** Tuner as above in handsome black and gold finished metal cabinet.  $6 \times 13\frac{3}{8} \times 8\frac{3}{8}$ ". Net...\$95.50

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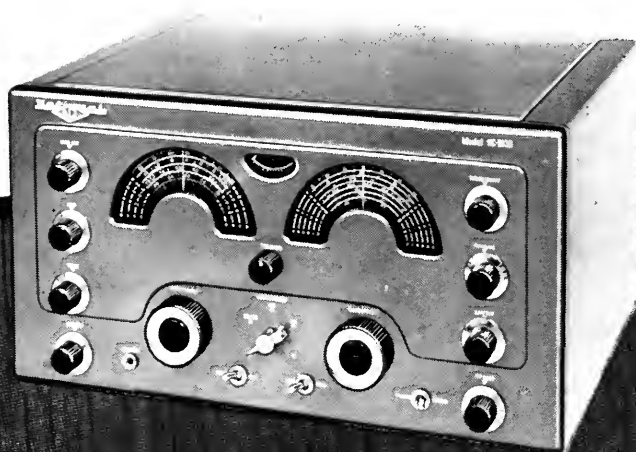
*Amateur Radio Station Log*  
*you can't log 'em*  
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No matter what else a receiver does, it must pull 'em in! And that's just what the NC-183D does! Compare its 1uv sensitivity (on 6 meters) and extremely low noise level with the highest-priced amateur receivers made (\$150 higher!) and you'll see why you'll hear more, log more on an NC-183D!

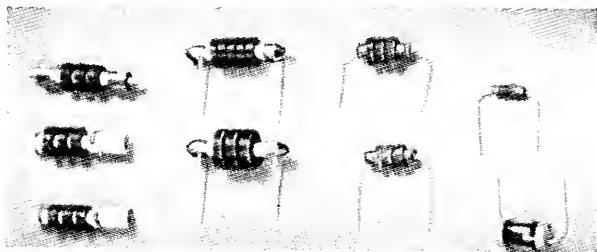
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**FEATURES:** Two tuned R.F. stages. 3 stages of I.F. Voltage regulated osc. and BFO. Main tuning dial covers range in five bands. Bandspread dial calibrated for amateur 80, 40, 20, 15, 11-10 and 6-meter bands. Bandspread usable over entire range. Six-position crystal filter. New-type noise limiter. High fidelity push-pull audio. Accessory socket for NFM adaptor or other unit, such as crystal calibrator.

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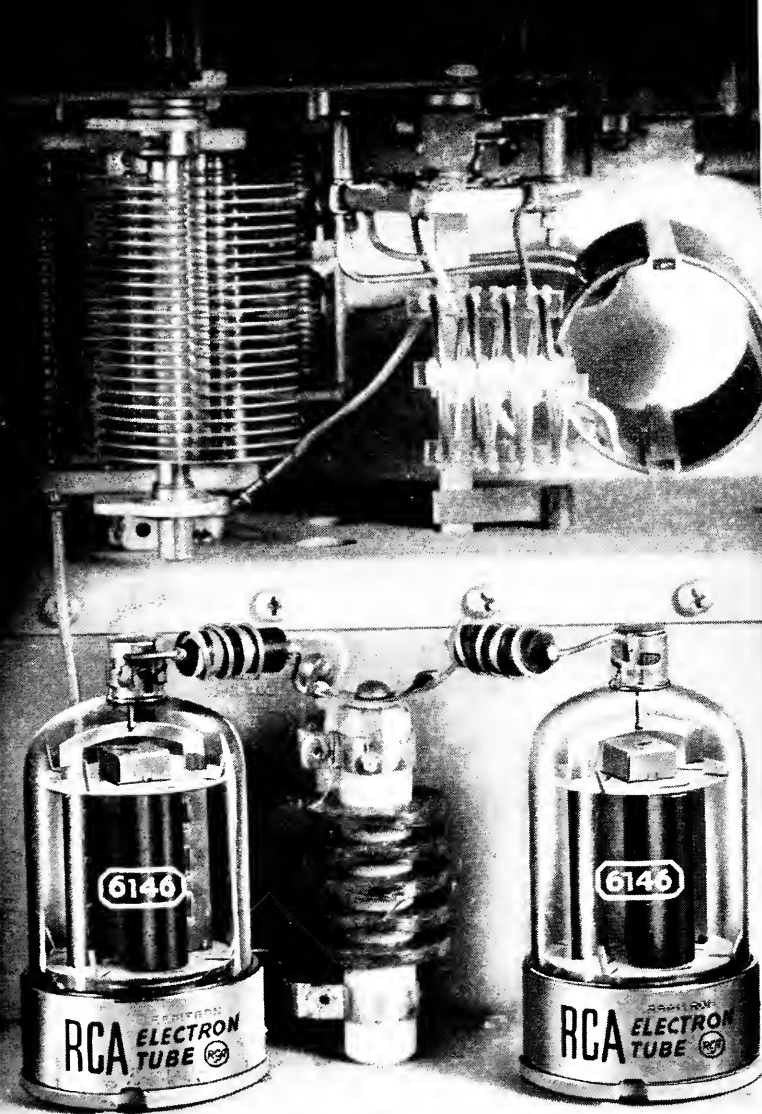
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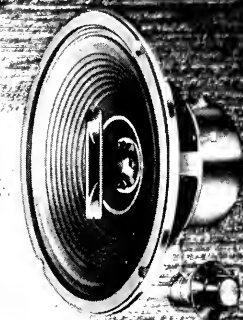
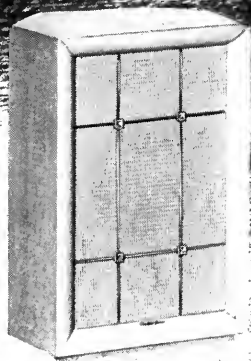
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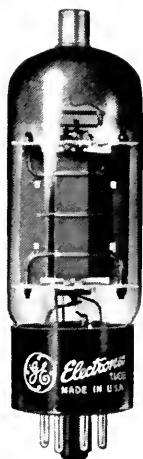
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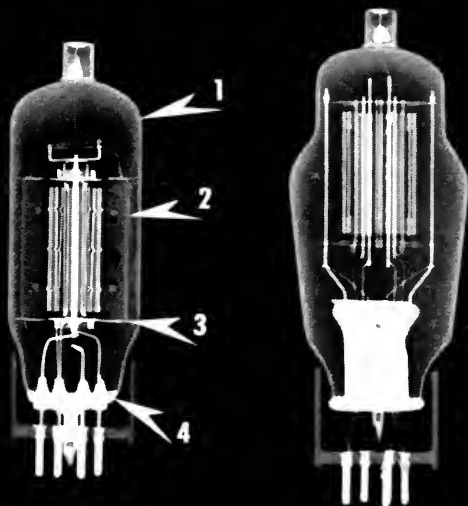
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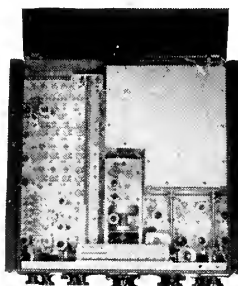
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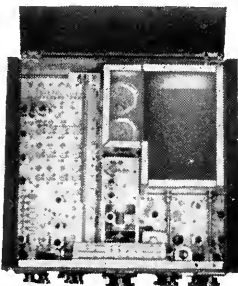
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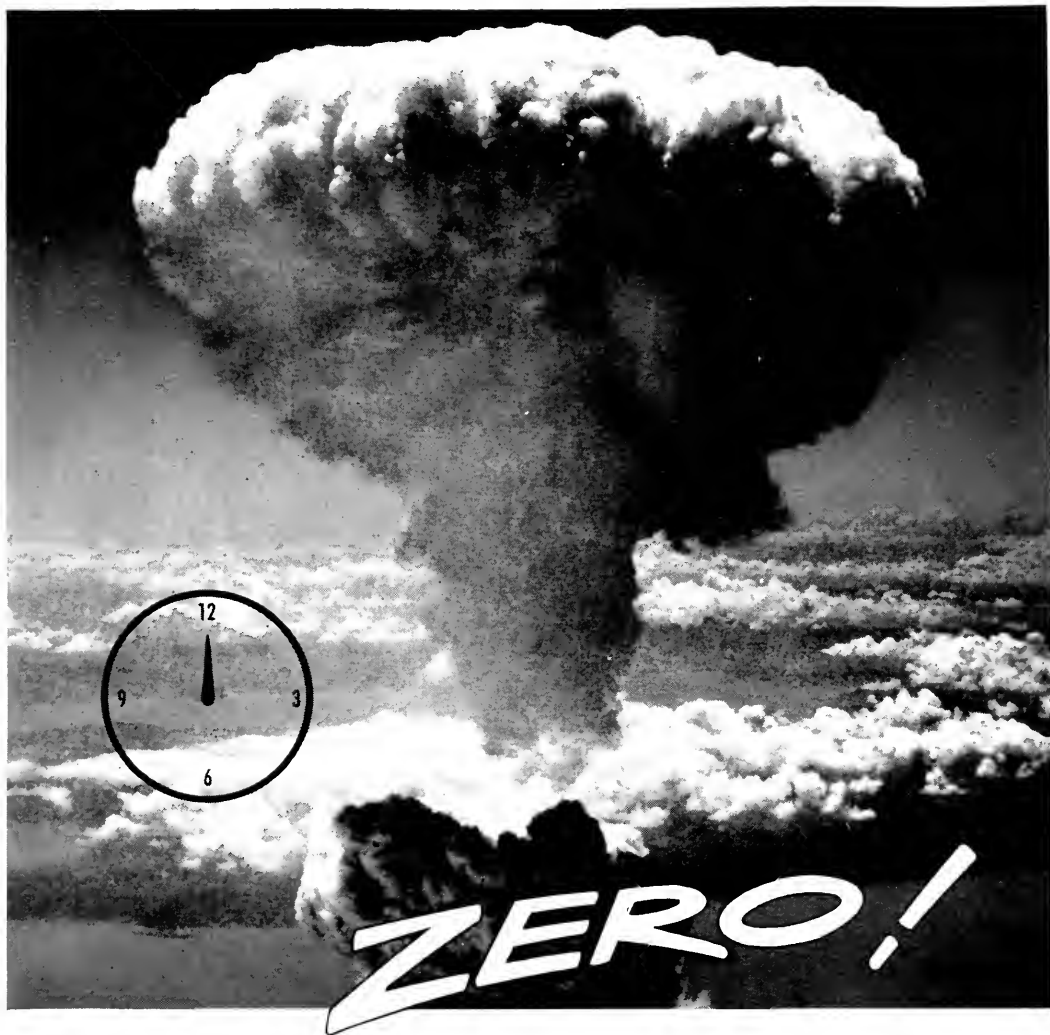
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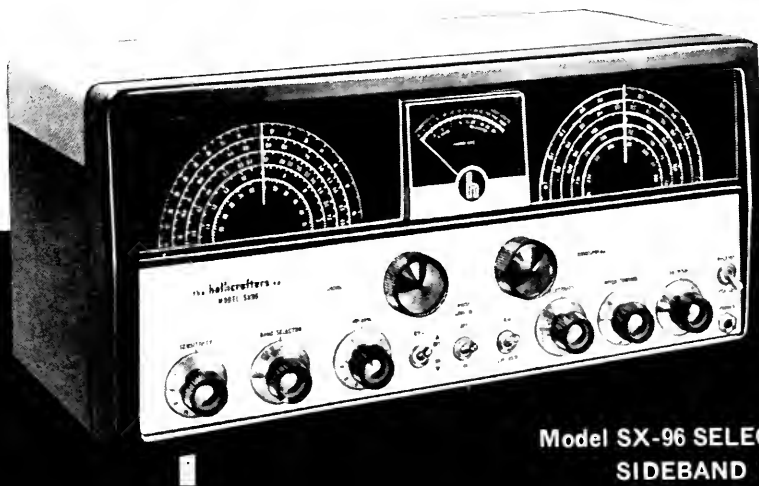
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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

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### Hudson Division

GEORGE V. COOKE, JR. . . . . W2OBU  
88-31 239 St., Bellerose 26, N. Y.  
Vice-Director: Thomas J. Ryan, Jr. . . . . W2NKD  
2339 Redwood Rd., Scotch Plains, N. J.

### Midwest Division

WILLIAM J. SCHMIDT . . . . . WØOZN  
306 S. Vassar, Wichita, Kansas  
Vice-Director: James E. McKim . . . . . WØMVG  
1404 S. Teuth, Salina, Kansas

### New England Division

PHILIP S. RAND . . . . . W1DBM  
Route 58, Redding Ridge, Conn.  
Vice-Director: Clayton C. Gordon . . . . . W1HRC  
65 Emerson Ave., Pittsfield, Mass.

### Northwestern Division

R. REX ROBERTS . . . . . W7CPY  
837 Park Hill Drive, Billings, Mont  
Vice-Director:

### Pacific Division

RAY H. CORNELL . . . . . W6JZ  
909 Curtis St., Albany 6, Calif.  
Vice-Director: Harry M. Engwicht . . . . . W6HC  
770 Chapman, San Jose 26, Calif.

### Roanoke Division

P. LANIER ANDERSON, JR. . . . . W4MWH  
428 Maple Lane, Danville, Va.  
Vice-Director: Theodore P. Mathewson . . . . . W4FJ  
110 N. Colonial Ave., Richmond, Va.

### Rocky Mountain Division

CLAUDE M. MAER, JR. . . . . WØIC  
740 Lafayette St., Denver, Colo.  
Vice-Director: Walter M. Reed . . . . . WØWRO  
1355 E. Amherst Circle, Denver, Colo.

### Southeastern Division

JAMES P. BORN, JR. . . . . W4ZD  
25 First Ave., N.E., Atlanta, Ga.  
Vice-Director: Randall E. Smith . . . . . W4DQA  
902 Plaza Court, Orlando, Fla.

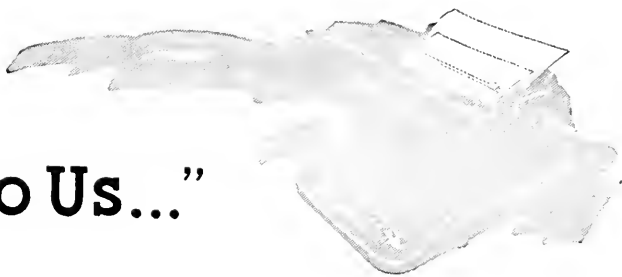
### Southwestern Division

WALTER R. JOOS . . . . . W6EKM  
1315 N. Overhill Drive, Inglewood 3, Calif.  
Vice-Director: Robert E. Hopper . . . . . W6YXU  
4327 Santa Cruz, San Diego 7, Calif.

### West Gulf Division

ROBERT E. COWAN . . . . . W5CF  
3640 Eucento Drive, Fort Worth 9, Texas  
Vice-Director: John F. Skelton . . . . . W5MA  
1901 Standish Dr., Irving, Texas

# "It Seems to Us..."



## FIELD DAY

One Saturday in mid-June of last year, from their homes in Canada, the U. S. and possessions, eight thousand three hundred and eighty persons,<sup>1</sup> who otherwise appeared perfectly normal, disappeared into woodlands, mountains and open fields carrying a little food and clothing and a lot of radio apparatus. There they set up two thousand and twenty-six<sup>1</sup> separate transmitter-receiver combinations operating independently of commercial power mains and for a solid twenty-four hours of the ARRL Field Day had themselves a time etching the Kennelly-Heaviside layer indelibly with "CQ FD."

The simple process of subtraction indicates that there were 114,907 holders of amateur licenses who did not take part in Field Day fun. We think they made a great mistake as any participant in the 1954 event will confirm. But it is a mistake which can easily be corrected — the opportunity will come again this June, on the 25th-26th. And with balmy days here again for most of us, now is the time. . . .

. . . Time to find out if Old Man Smith's apple orchard will again be available for an operating site. We've got to try out the generator, to make sure the needle valve isn't gummed up again, and that the gas line isn't about to expire from old age. The tent will have more leaks than last year, but we'll try the paraffin again and keep our fingers crossed. We take our local public relations seriously, but that new reporter on the *Daily Blast* may not think a night on a canvas cot contributes anything to the public knowledge. Shall we use an antenna changeover relay this year, or just toss a wire out the window for receiving? We've got to decide whether we'll have a multi-station set-up so everyone can operate Sunday afternoon, or stick to one station and keep it busy all night. Bill Jones' XYL will say she doesn't think she wants to provide the grub this year, and then change her mind, as she always does, and put on a magnificent spread. . . .

So we'd better devote the next meeting to Field Day. And you'd better, too. First thing you know it will be time to put up the antennas, and then you'll suddenly remember

that one of the masts got broken when somebody let go of a guy wire last year. And that table leg needs fixing again. So, you see, if you don't get busy you're liable to miss all the fun — and have only yourself to blame.

We think FD is the top event of the amateur year. Where else, in one week end, can you combine the good-fellowship of a hamfest, the underlying motive of preparation for public service, the fresh air and fun of a picnic, the teamwork of coöperative effort, and the excitement of an operating contest? If you haven't tried it before, make it *this* year. BCNU/1!

## MOBILE SAFETY

For some time now we've been on the verge of reminding amateurs of the importance of careful driving during mobile operations, a responsibility accentuated by the growing number of states which issue call-letter license plates. "Lighthouse Larry" in *G-E Ham News* last summer stated the case so nicely, however, that we can't do better than commend to your serious attention the following excerpts from his editorial:

. . . The license plate program has met with considerable success throughout the nation — and has given us a great boost in publicity. In many cases we are thus put on a level with doctors and other public servants.

However, as we attain this stature we also have to remember that it behooves us to live up to our new standing — by added care and courtesy on the road. Need more be said than to comment that every traffic ticket a ham with call-letter license plates gets is a black eye for ham radio? And suppose through our carelessness it should be something worse than just a "ticket"? Suppose it's a broken, twisted body of a child on the highway? We see such pictures in the newspaper once in a while. And I fervently hope I never see one which includes a "murder car" bearing ham call-letter license plates.

You think this is a painful and unpleasant subject? Sure is, but not half as painful and unpleasant as the real thing. We bring it up in the hopes that a few thoughts now, beforehand, may prevent the real thing from ever happening.

<sup>1</sup> And probably many more not reported to Hq.

## A.R.R.L. PACIFIC DIVISION CONVENTION

**Fresno, Calif. — May 21-22, 1955**

The 1955 ARRL Pacific Division Convention will be held in Fresno, Calif., on Saturday, May 21st, and Sunday, May 22nd, and will be sponsored by the Fresno Amateur Radio Club, Inc. There will be two days of excellent entertainment consisting of a variety comedy program, many outside activities, electronic exhibits, technical discussions, and mobile hunts, mobile judging, and ladies' luncheon and activities, topped off with a barbecued steak banquet. The price for each ticket is \$6.75. For further details address inquiries to: 1955 ARRL Pacific Division Convention, % Grant Storey, W6NTK, 908 West Pico St., Fresno 5, Calif. Preregistration ends May 16th, 12:01 A.M. If you desire to register early, make out your checks to the Fresno Amateur Radio Club, Inc.

### COMING A.R.R.L. CONVENTIONS

May 7th-8th — Oregon State, Portland, Ore.  
May 21st-22nd — Pacific Division, Fresno, Calif.  
June 10th-12th — West Gulf Division, Fort Worth, Texas  
June 11th-12th — North Dakota State, Bismarek, N. D.  
June 11th-12th — Southeastern Division, St. Petersburg, Fla.  
July 30th-31st — Canadian Division, St. John, New Brunswick  
August 12th-14th — Roanoke Division, Old Point, Va.  
October 15th-16th — Central Division, South Bend, Ind.  
October 22nd-23rd — Midwest Division, Omaha, Neb.

## Strays

"2 Meter Men Held in Thefts" was a headline recently appearing in *The Evening Bulletin*, a Philadelphia newspaper. Further reading revealed that they were not v.h.f. men, but parking-meter collectors! — W3YKT

During his first few weeks on the air, KN2SSP worked Huntington Woods, Mich., Huntington, L. I., N. Y., and Huntington Station, N. Y.

When the Hartford County Amateur Radio Association scheduled W0EDX as guest speaker at one of their get-togethers, the meeting notices to members read "Al Pichitino, WEDX, Chief Engineer of the E. F. Johnson Company. . . ." Calling the mailing service to complain about the error, HCARA prexy, W1ULY, got the following indignant reply: "You had a zero in there, but it was crossed out!"

In Portland, Ore., Sharon La Baugh, a youngster stricken with leukemia, asked if she might have a watermelon. None being available in that city, her wish was brought to the attention of Portland amateurs who originated an emergency request for a melon. After much relaying, in which many hams participated, the plea was received at Miami, Fla. From there, two melons were sent by air to the afflicted child.

W8NSX heard W9NSX in contact with W9PCY. Breaking in, W8NSX was followed by none other than W8PCY. This shrinking world!

### OUR COVER

Sweepstaker Dick Baldwin, W1IKE, is shown tuning the transmitter he describes in "Easy Shielding for Ninety Watts." The article begins on page 25 of this issue. (Photo by W1UPX)



**May 1930**

. . . New records set . . . all continents active . . . excellent reception . . . foreign stations craving more U. S. activity! These are the highlights of "International Communications on 28 Mc.," by Clark C. Rodimon, W1SZ.

. . . QST announces the appointment of George Grammer, W1DF, as Assistant Technical Editor. Mr. Grammer, formerly W3AIH of Audubon, N. J., joined the Headquarters staff last fall to take charge of the ARRL Technical Information Service.

. . . Pioneering in the field of air-to-ground communications is still continuing with recent 'phone experiments. A summary of the latest is presented by C. H. Vincent, W8XB-W8RD, in "Airplane Radiophone Communications Experiments."

. . . In keeping with Mother's Day, the "Old Man" pays a fine tribute to moms (especially those of hams!).

. . . W4GV is described as a station featuring effectiveness, convenience, and low cost. Operator Cornelius W. Zimmerman pounds the ether with two transmitters putting out healthy signals on 7 and 14 Mc. The receiver is a simple, but nevertheless effective, two-stage "blooper."

. . . In "Our Regulations Are Revised," K. B. Warner tells of latest FCC changes in amateur regulations. Among them are the solidification of the amateur's position, better plate supplies required, the 10-meter band made exclusively amateur, and compulsory logkeeping.

. . . A light, compact, and completely shielded "inhaler" that covers a wide frequency range as well as being self-contained is described by Howard A. Chinn in "An All-Service Portable Receiver."

. . . "ARRL Coöperates with the 'Aretic Patrol' in Mid-winter Maneuvers," by F. E. Handy, gives a vivid description of the role played by amateur radio in assisting the Army Air Force.

. . . "The All-Section Sweepstakes Contest," by E. L. Battey, recounts the results of this highly successful "race." Top honors go to W1ADW who tallied 13,158!

. . . A new system of uniform tube designation is being adopted by QST. Under the new plan, a UX-210 becomes Type '10, a DeForest 422 becomes Type '22, etc.



# The "Z-Match" Antenna Coupler

*Impedance Matching the Easy Way*

BY ALLEN W. KING,\* W1CJL

"WHEN it takes more time to make frequency changes in an antenna-coupler circuit than it does in a 500-watt rig, it's high time something should be done about it." The quotation is from a 1954 *QST* that appeared at just about the time the "Z-match" was finished and in operation. Having been a user

• This comes close to being the ultimate in multiband antenna couplers, from the standpoint of convenience and ease of operation. Using a multiband tank in an ingenious circuit arrangement, it offers switchless 3.5–30-Mc. operation plus quick and certain adjustment to optimum coupling by means of a built-in bridge.



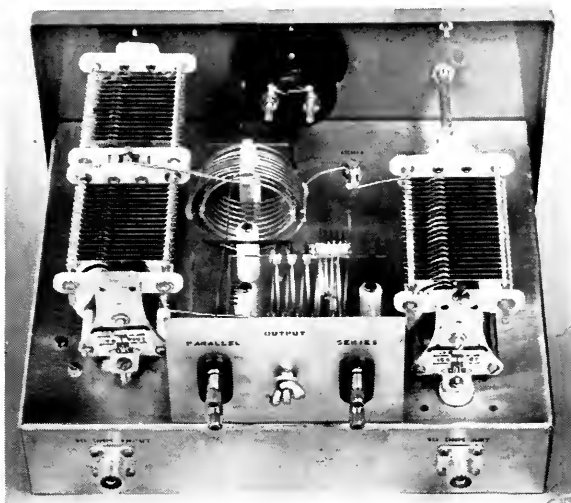
Panel view of the "Z-match" antenna coupler. Incorporating a built-in bridge for forward and reflected power and a dummy antenna, it uses a multiband tank in a new circuit arrangement for matching the usual run of transmission-line loads to a coaxial link.

of all-band tank circuits for the past few years, the writer had decided to attempt to use one in reverse, and some interesting results were obtained.

The "Z-match" antenna coupler is designed for use with transmitters having up to 250 watts input, and will match a 50-ohm coaxial line to both reactive and nonreactive loads ranging from

\*Project Engineer, Harvey-Wells Electronics, Inc., Southbridge, Mass.

The multiband tank circuit consists of the split-stator capacitor at the left and the two inductors, with links, in the center. Coupling is controlled by the tank and the capacitor at the right. The two-terminal assemblies connect to the two link coils.



following the layout of the unit, especially the forward- and reflected-power indicating device.

### Construction

The "Z-match" shown in the photographs is built on an  $11\frac{3}{4} \times 9\frac{1}{4} \times 2\frac{1}{2}$ -inch chassis, and the panel is  $12\frac{1}{4}$  by  $6\frac{3}{4}$  inches. These were used because they were on hand, but any number of commercially-available chassis and dust-cover combinations could be used with good results.

The chassis itself is used to separate the low-impedance input circuits from the comparatively high-Z output circuits, and no matter what size chassis is used this constructional practice should be followed. The coupling capacitor  $C_{10}$  is electrically above ground and is mounted on two feed-through insulators (Johnson type 135-55), one of which is used to bring the electrical connection through the chassis to the rotor of  $C_{10}$ . This capacitor is set back from the panel and coupled to the dial by an insulated shaft, thus eliminating body capacity.  $C_{11}$  is mounted at the other end of the chassis and the control is brought out through the panel with symmetry in mind. Inductors  $L_2$  and  $L_4$  are mounted near the rear output terminal panel, mainly because this is the high-frequency section (14 to 30 Mc.) and over-all lead length should be kept to a minimum. Coils  $L_1$  and  $L_3$  are mounted at right

angles to  $L_2$  and  $L_4$  to reduce mutual coupling.

The output terminal panel on the rear of the chassis has two National type FWH connectors and a wing-nutted ground terminal, allowing the operator to connect either balanced or unbalanced antennas. The two output terminals (high and low frequency) could very well be one, if an antenna changeover relay was used, although separate connectors are convenient when separate antennas are used.

The two rotary switches  $S_1$  and  $S_2$  are placed in a position to maintain panel symmetry, and also to keep lead lengths to a minimum for the connections to  $S_2$ . As can be seen from the photographs, the 50-ohm dummy load is mounted on standard fuse clips and the "hot" end is kept as close to the ceramic switch  $S_2$  as possible. The dummy load has been insulated from the chassis at the hot end by a  $\frac{1}{4}$ -inch-thick phenolic block; however, the same feed-through that was used on  $C_{10}$  could be used instead. The grounded end is raised up from the chassis merely in keeping with good constructional practice. This can be done with a metal spacer having the same height as either the phenolic block or the feed-through type insulator, whichever is used.

The rear-view photograph shows the output terminals marked as "parallel" and "series." These, however, could be called "low-frequency"

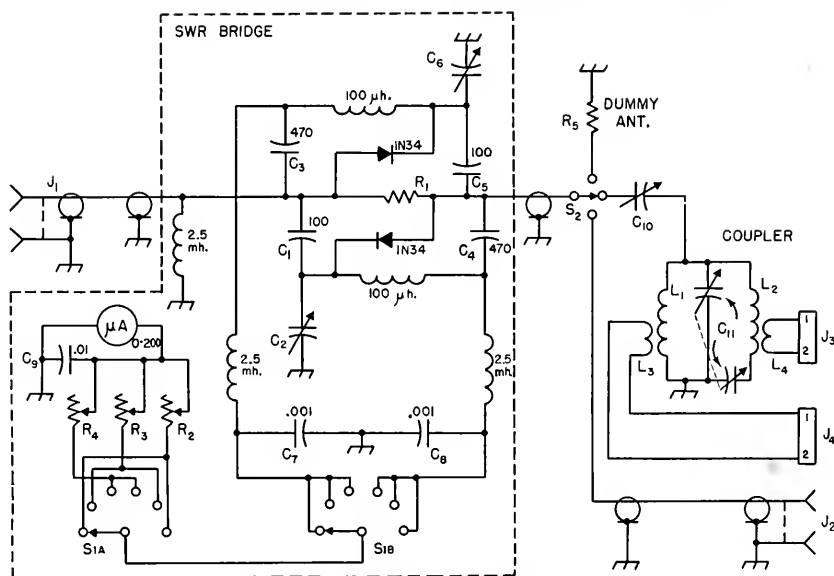
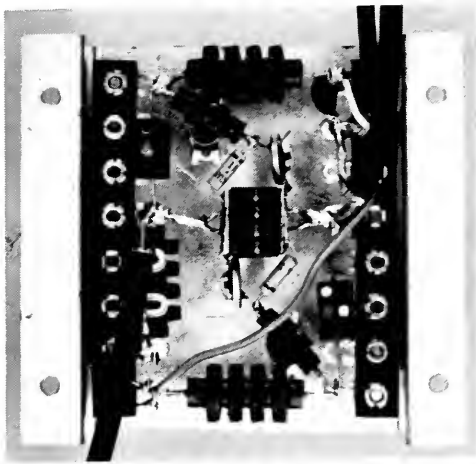


Fig. 1 — Circuit diagram of the "Z-match."

- $C_1, C_5$  — Erie button type or equivalent.
- $C_2, C_6$  — Tubular-type variable, 0.5–5  $\mu\text{mf}$ . (Erie type 532-08).
- $C_3, C_4$  — Mica or ceramic.
- $C_7, C_8, C_9$  — Disk ceramic.
- $C_{10}$  — 340- $\mu\text{mf}$ . variable (Bud 1529).
- $C_{11}$  — 250- $\mu\text{mf}$ . per-section variable (Bud 1556).
- $R_1$  — 0.625 ohm, 8 watts (sixteen 10-ohm  $\frac{1}{2}$ -watt composition resistors in parallel).
- $R_2$  — 2500-ohm carbon potentiometer.
- $R_3$  — 25,000-ohm carbon potentiometer.
- $R_4$  — 50,000-ohm carbon potentiometer.
- $R_5$  — 50 ohms, 50 watts (GE Globar type CX).
- $L_1$  — 3.4  $\mu\text{h}$ .; 7 $\frac{3}{4}$  turns No. 14, 2 1/16-inch diam.,

- 1 $\frac{1}{4}$  inches long.
- $L_2$  — 1.7  $\mu\text{h}$ .; 5 $\frac{1}{2}$  turns No. 14, 2 1/16-inch diam., 1 $\frac{3}{4}$  inches long.
- $L_3$  — 2.35  $\mu\text{h}$ .; 6 $\frac{1}{2}$  turns No. 14, 2 $\frac{5}{8}$ -inch diam.,  $\frac{5}{8}$  inch long.
- $L_4$  — 1.8  $\mu\text{h}$ .; 4 $\frac{3}{4}$  turns No. 14, 2 $\frac{5}{8}$ -inch diam.,  $\frac{1}{2}$  inch long.
- $J_1, J_2$  — Coaxial connectors.
- $J_3, J_4$  — Binding-post assemblies (National type FWH).
- $S_1$  — Rotary switch, 2 poles, 6 positions (bakelite wafer).
- $S_2$  — Rotary switch, 1 pole, 3 positions, shorting (ceramic wafer).



The bridge assembly. The circuit arrangement is made symmetrical for the purpose of reducing the effects of stray capacitance and inductance. The resistors in the center ( $R_1$ ) are assembled in the form of a cylinder supported by soldering their leads to circular pieces of wire. This reduces inductance and tends to assure uniform current distribution throughout the assembly.

and "high-frequency" outputs. The thought in marking them "parallel" and "series" was that the low-frequency tank coil is parallel connected, while the high-frequency tank coil is the series circuit.

#### *S.W.R. Bridge*

The s.w.r. bridge consists of two bridges connected back to back so that incident and reflected power may be determined. The theory and operation have been ably presented elsewhere and will not be dealt with here.<sup>1</sup>

The incident-power bridge consists of  $R_1$ ,  $C_5$ ,  $C_6$  and the transmitter output impedance; the reflected-power bridge consists of  $R_1$ ,  $C_1$ ,  $C_2$  and the load. The output of the bridge is rectified by

<sup>1</sup> Jones and Sontheimer, "The Micromatch," *QST*, April, 1947. See, also, "Recent Equipment," p. 43, *QST*, March, 1955.

Switches, input circuit, bridge and dummy antenna are below chassis. The three variable resistors at the upper left in this view are adjusted for proper power calibration of the bridge and thereafter left set. The Global resistor used as a dummy antenna is along the right-hand edge.

the crystal diodes. A d.c. path is provided by the r.f. choke. The rest of the components are used for r.f. filtering.

$R_1$  consists of sixteen 10-ohm  $\frac{1}{2}$ -watt composition resistors in parallel. Since the bridge is designed to operate from 3 to 30 Mc., it is important that noninductive resistors be used. For best results,  $C_1$  and  $C_5$  should be of the button type. They proved to be decidedly better than silver micas. Needless to say, all lead lengths should be kept as short as possible to reduce the effects of lead inductance. The layout shown in the photograph should be followed, and since this shows the placement of parts quite clearly, constructional details will be omitted.

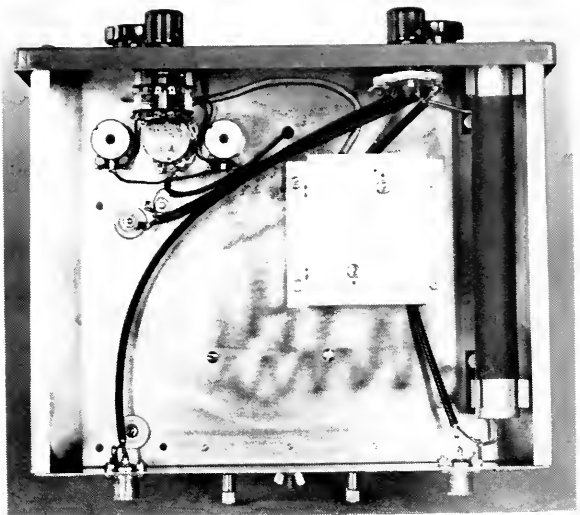
In the initial set-up of the bridge, set  $S_2$  to the dummy load position, apply r.f. power to the input terminal, and adjust  $C_2$  for zero deflection. Next, temporarily reverse the bridge and adjust  $C_6$  for zero deflection. Then return to the original input-output connections and the bridge is ready for calibration. A good calibration will require comparison with an already-calibrated power meter, or by calculation from the r.f. current in the dummy load as measured by an r.f. ammeter connected in series with the load. The full-scale power values (three ranges are provided for) may be set by adjusting  $R_2$ ,  $R_3$  and  $R_4$ . However, an actual power calibration is not at all necessary to the operation of the "Z-match," since the bridge will serve quite well both for adjustment of coupling and for relative power indications without calibration.

The meter used in the bridge has a basic movement of 0-200 microamperes, and in this case a hand-calibrated scale was made by taking the original meter plate off and reversing it. The three scales were then hand-painted on, as the photograph shows.

#### *Operation*

The bridge provides a visual way of adjusting the coupler, while the 50-ohm noninductive load

(Continued on page 116)



# Automatic Mobile Antenna Tuning

## *A Self-Resonating System for 40 and 75*

BY JOHN A. HARGRAVE,\* WØIGP

It is obvious that mobile operation of the amateur station has increased many times during the past several years. While the 10-, 15- and 20-meter bands offer a general efficiency and convenience of operation from a mobile station comparable to that of the home station, 40 and 75 meters present a more difficult problem. This may be attributed primarily both to practical power limitations and poor radiation-system efficiencies. It has been generally proven that, except for increased physical length, the greatest single factor contributing to the efficiency of a loaded antenna system is loading-inductor efficiency or  $Q$ . The greater the r.f. resistance of a given loading inductance, the greater will be the r.f. loss resulting from its operation. It becomes apparent that for a practical figure of efficiency, maximum practical loading-inductor  $Q$  must be maintained, and general transmitter and coupling efficiency must be kept at a reasonably high figure.

The expression "high  $Q$ " is a relative quantity and strictly dependent on the peculiar interpretation of the user. High  $Q$  is generally synonymous with the presence of a sharply resonant circuit with a narrow bandpass characteristic. Generally speaking, a high- $Q$  5- to 8-foot mobile whip antenna, loaded for the 75-meter band, will be sharply resonant, and will begin to appear seriously reactive at a deviation from the carrier frequency of about 5 ke. Any effort to broaden the response by loading-inductor construction will, in the majority of cases, be merely a compromise

\* R.F.D. 1, New Sharon, Iowa.

• Most mobile operators, especially those working 40 and 75, understand the inconvenience of having to stop and re-tune the antenna for every few kilocycles changes in frequency. The system described here does away with all this by automatically reresonating the antenna whenever frequency is shifted. It also compensates automatically for detuning caused by antenna lay-back, or opening the trunk.

in efficiency and a most dear one. Much has been written concerning high-efficiency loading inductors, and any basic theories conscientiously applied will in all probability result in an appreciable increase in  $Q$  and radiation efficiency.

An increasingly large number of the mobile transmitters being built are for multiband and VFO operation. The majority of these are being mounted beneath the automobile instrument dash, within easy reach of the driver-operator. Mobile VFO seems like a marvelous convenience until it is realized that the carefully designed antenna system is restricted to a bandwidth of a few kilocycles. It is mechanically practical to provide an adjustable whip length or to afford a manually adjustable inductor to enable multi-frequency operation, although their location by necessity must be remote from that of the under-dash-mounted VFO transmitter.

WØIGP's under-dash mobile installation. The automatic antenna-tuner control box is at the right. The shafts of the two potentiometers extend from the bottom.



Within this article is described a system for use over the 40- and 75-meter bands providing automatic adjustment of antenna resonance in response to the output frequency of the mobile transmitter. It permits maximum use of VFO control and convenient use of maximum- $Q$  antenna systems. This system was installed in the author's 1953 Buick and has proven very successful and a great convenience. The present mobile transmitter runs 40 watts input, but the system has been used successfully with input powers of from 15 to 300 watts. Although the system was designed for mobile operation, it has been used experimentally on a fixed-station vertical and has proven very satisfactory.

### Circuits and Theory

This system<sup>1</sup> consists of a device for detecting antenna resonance, and provides control of a reversible motor which is coupled to a variable antenna-tuning inductance located at the base of the antenna. An inductive load, as observed by the detector, will cause the motor to rotate in one direction, while a capacitive load will cause it to operate in the other direction, such rotation reestablishing antenna resonance.

It is generally understood that an r.f. transmission line terminated in a pure resistance equal to its characteristic impedance will be flat. This means that there will be no reflections from the loaded end of the line, and that at any point along that line the voltage and current will be in phase. A high- $Q$  antenna may be matched to a given type of transmission line but, should the resonant frequency of the load shift to a slightly higher or lower frequency, or should the exciting frequency change to a lower or higher frequency, the antenna system will no longer present a purely resistive load to the transmission line and a complex load will reflect a standing wave back along the transmission line. Under such a condition a shift in voltage/current phase and amplitude relationship will result. These factors produce an increase in load impedance and a significant drop in transmitter loading. The detecting system operates as a result of these variables reestablishing a resistive termination.

The phase detector used in this system is quite similar to the Foster-Seeley f.m. discriminator. Operation of the conventional discriminator results from the phase relationships existing in a transformer having a tuned primary and secondary, both capacitively and inductively coupled. The phase detector shown here in Fig. 1 operates from a low- $Q$  impedance, both capacitively and inductively coupled to the r.f. antenna transmission line. This impedance, represented by  $L_2$  and its distributed circuit capacitances, provides sufficient impedance for satisfactory circuit operation and avoids the inconvenience of a tuned tank. As was previously stated, providing a proper match exists between the r.f. load and its trans-

mission line, r.f. current and voltage on such a line will be in phase. The voltage on the line is used as a reference, and a small amount of this voltage is coupled into the detector circuit through the distributed capacitance existing between  $L_1$  and  $L_2$ . The relative amount of this

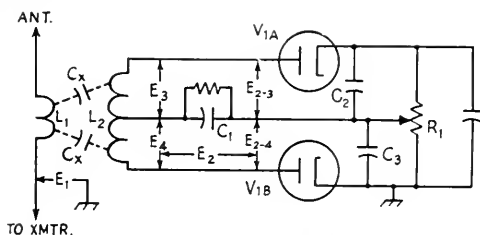


Fig. 1 — Phase-detector circuit used to produce control voltage for the automatic mobile-antenna resonator.

- $E_1$  — Voltage across transmission line.
- $E_2$  — Portion of  $E_1$  determined by the voltage-divider ratio of  $C_1$  and distributed capacitance,  $C_x$ .
- $E_3, E_4$  — Voltage induced by  $L_1$ - $L_2$  mutual.
- $E_{2-3}, E_{2-4}$  — Vector sums of applied voltages,  $L_2$  is self-resonant at a frequency considerably above normal frequencies of operation,  $L_1$  is a  $3/4$ -turn link in series with the antenna and transmission line,  $C_2$  and  $C_3$  provide very low impedance to r.f. currents.

voltage applied to the detector circuit is determined by the capacitive voltage-divider ratio of the distributed capacitance between  $L_1$  and  $L_2$ ,  $C_x$ , and the value of capacitor  $C_1$ . A second voltage, necessary to provide a medium of phase comparison, is introduced as a result of line current flowing through  $L_1$ . Such a current will create a magnetic field about  $L_1$  and, because of mutual inductance, will produce a current and resultant voltage in the secondary coil  $L_2$ . The resulting voltage across  $L_2$  will lag the inducing current through  $L_1$  by 90 degrees.

The two voltages described above appear in series between the plate of each diode and the center tap of  $R_1$ . Voltages  $E_3$  and  $E_4$  are separated in phase by 180 degrees, with reference to the center tap of  $L_2$ , and are in quadrature with voltage  $E_2$  when a condition of resonance is observed on the transmission line under examination. Under these conditions the effective voltage on the plate of each diode will be of similar amplitude, and will produce a rectified voltage of equal and opposite sign across each half of the load resistor  $R_1$ . The resultant sum of zero volts across  $R_1$  indicates a resonant and balanced condition, as indicated in Fig. 2A.

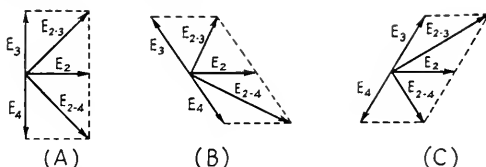


Fig. 2 — Voltage vector relationships for conditions (A) — when the antenna is resonant, (B) — when the antenna is above resonance, and (C) — when the antenna is below resonance. Voltages refer to Fig. 1.

<sup>1</sup> Knoop, "Automatic Tuning of the Antenna Coupler," August, 1952, *QST*; Mezger, "A Phase-Angle Detector for R. F. Transmission Lines," July, 1952, *QST*.

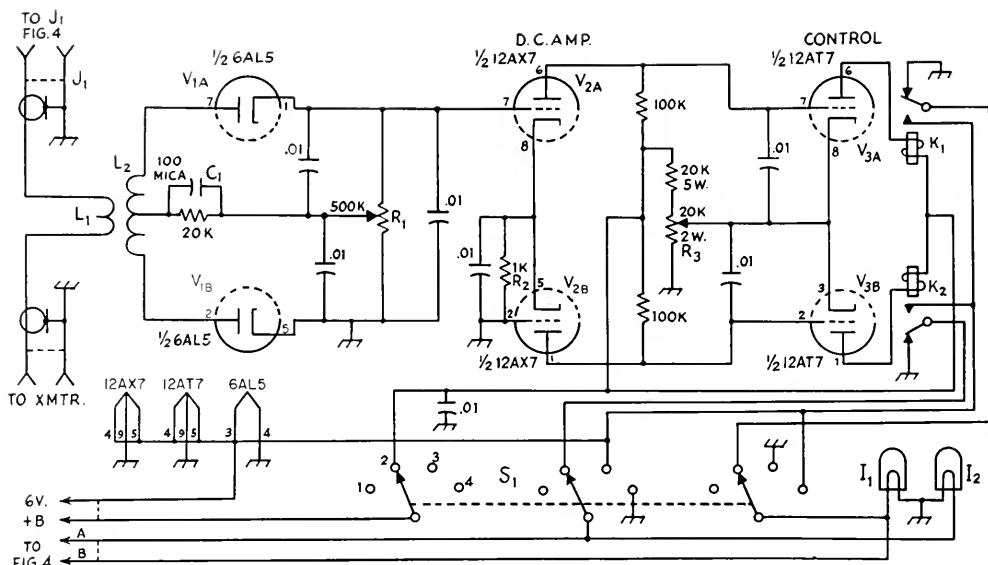


Fig. 3 — Circuit of the automatic mobile antenna tuner.

C<sub>1</sub> — Mica; all other capacitors are disk ceramic.

R<sub>1</sub> — IRC type Q.

R<sub>3</sub> — Ohmite type AB.

R<sub>4</sub> — Wire-wound.

All other resistors 10 per cent carbon,  $\frac{1}{2}$  watt, unless otherwise specified.

L<sub>1</sub> — Approx.  $\frac{3}{4}$  turn No. 16 wire, over center of L<sub>2</sub>.

L<sub>2</sub> — 20 turns No. 18 enameled wire close-wound, center-tapped on  $\frac{3}{8}$ -inch bakelite rod.

I<sub>1</sub>, I<sub>2</sub> — Green and amber  $\frac{1}{2}$ -inch indicator lamps.

K<sub>1</sub>, K<sub>2</sub> — S.p.d.t. plate-circuit relay, 10,000 ohms (Potter-Brumfield LB5).

S<sub>1</sub> — 3-pole 4-position rotary switch (Mallory 3234-J).

In the event of antenna detuning or a change in transmitter frequency, a change in the current and voltage phase relationship along the transmission line will result, and a balanced output from V<sub>1A</sub> and V<sub>1B</sub> will no longer exist. It may again be said that the reference voltage introduced by the capacitive coupling is in phase with the voltage along the line, but there is no longer a 90-degree phase relationship between this voltage and that developed across L<sub>2</sub> as a result of line current through L<sub>1</sub> and L<sub>1</sub>-L<sub>2</sub> mutual inductance. Under such conditions, phase relationships similar to the vectors indicated in Figs. 2B and 2C will result. From this it may be seen that a phase shift in one direction, as a result of a change in the exciting frequency, or a change in the frequency of antenna resonance, will cause the detector to produce a negative output voltage, while the opposite change in frequency or antenna resonance will cause the detector to produce a positive output voltage. Potentiometer R<sub>1</sub> is a balancing control, the proper adjustment of which will overcome circuit unbalances and will provide balanced output.

The complete control circuit is shown in Fig. 3. The 6AL5 phase detector provides a d.c. output voltage of either positive or negative polarity dependent upon the resonant frequency of the antenna system in reference to the transmitter operating frequency. This output voltage is applied to the grid of a d.c. amplifier, V<sub>2A</sub>, Fig. 3. V<sub>2A</sub> is cathode-coupled, by way of cathode resistor R<sub>2</sub>, to V<sub>2B</sub>, and the plate circuits of both sections of V<sub>2</sub> are directly coupled to the grids of

the control tube, V<sub>3</sub>. In order to provide d.c. voltage amplification, direct interstage coupling is necessary. This arrangement places the entire plate potential of V<sub>2A</sub> and V<sub>2B</sub> on the respective control grids of V<sub>3</sub>. Under conditions of antenna resonance, the phase detector provides approximately zero volts output, and sensitivity control R<sub>3</sub> is adjusted to the point where the static plate current of V<sub>3A</sub> and V<sub>3B</sub> will not hold relays K<sub>1</sub> and K<sub>2</sub> in the energized position. This adjustment places the cathodes of V<sub>3</sub> at a more positive potential than their respective control grids, this bias being of such magnitude as to approach plate-current cut-off.

Following adjustments of balance and sensitivity, any slight change in phase detector output will cause either K<sub>1</sub> or K<sub>2</sub> to operate, causing the tuning motor to rotate in one direction or the other.

### Matching Antenna to Line

It is necessary that the transmission line from the transmitter to the loaded antenna be made relatively flat if smooth indication and operation is desired from one band edge to the other. This may sound like a difficult task, but the adjustment may be made with very little equipment or effort. It essentially requires that the loaded antenna at resonance present the same load to the transmission line as a noninductive resistor equal in resistance to the characteristic impedance of the transmission line. Providing no more than 20 watts of power is made available at the base of the loaded whip, ten 500-ohm 2-watt

carbon resistors may be placed in parallel to act as a dummy load for RG-8/U cable. The impedance-matching system utilized with this antenna consists of a plug-in coil,  $L_2$ , Fig. 4, mounted on the remote tuning unit, and connected from the input side of the variable loading inductor,  $L_1$ , to the automobile body. A satisfactory adjustment may be made by establishing normal transmitter loading with the dummy load, then switching to the antenna system and, while maintaining antenna resonance, adjusting the matching inductance for identical load conditions. It will be found that a difference of as much as one quarter turn will have considerable effect on loading and the proper impedance match. A 6-turn coil  $1\frac{1}{2}$  inches in diameter, 2 inches long, was found satisfactory for this particular installation when operating in the 75-meter band. The circuit for the remote tuning unit is shown in Fig. 4 and a photograph of the unit is also included.

### General Design

This system contains two basic units:

- 1) The control unit consisting of a  $4 \times 4 \times 2$ -inch box mounted beneath the instrument dash, and containing all detecting and control circuits and components other than the motor, the motor-reversing relay and the impedance-matching and variable inductors. All components associated with the control unit are mounted within the box with the exception of the three vacuum tubes. These are mounted on the rear lip of the unit to afford adequate circulation of air.
- 2) The remote tuning unit is located in the automobile trunk, adjacent to the base of the loaded whip. It contains the variable series in-

Motor-driven antenna-tuning unit. The plug-in inductor is the matching inductor shown in Fig. 4. This unit is placed in the trunk of the car, as close to the base of the antenna as possible.

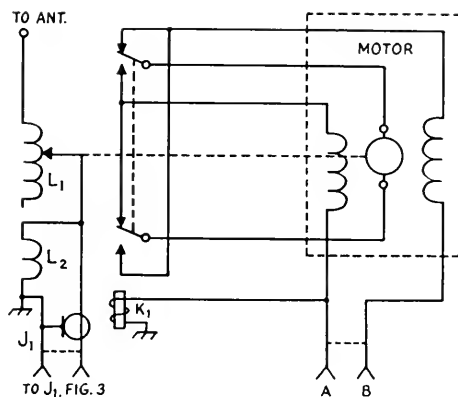
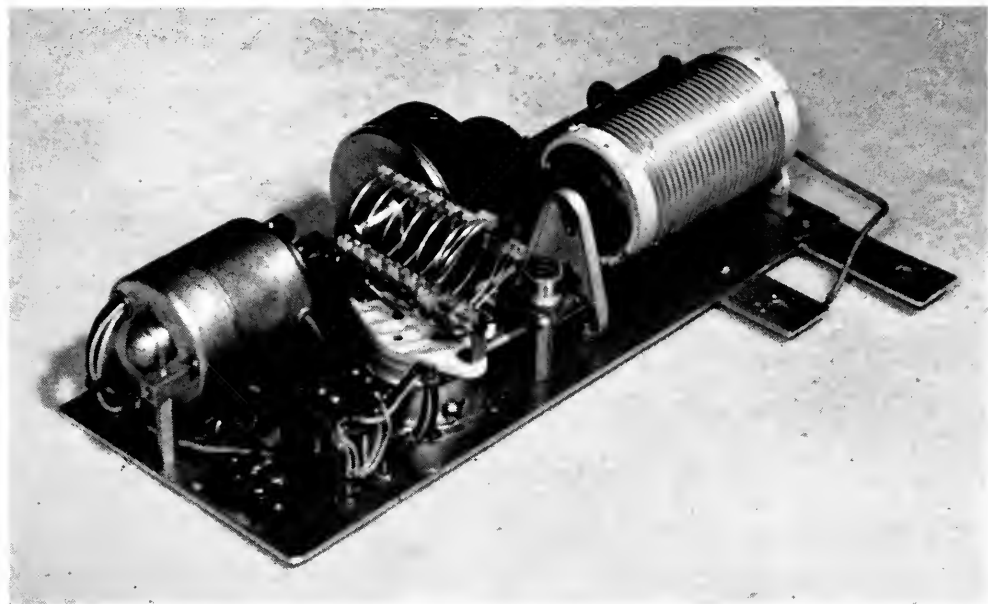


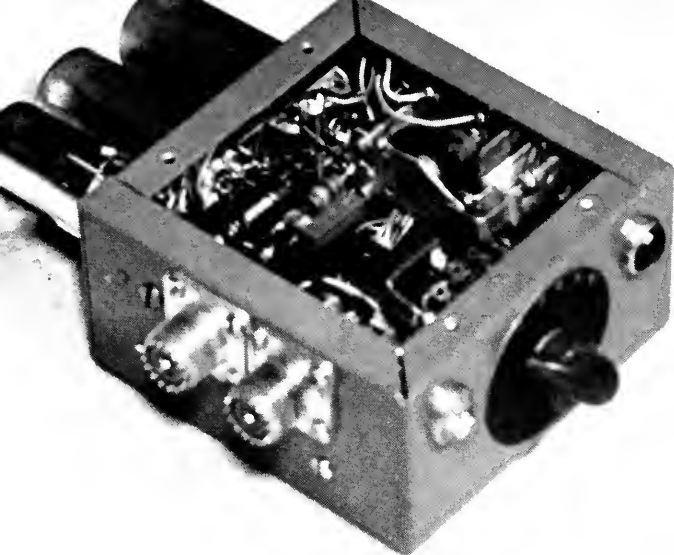
Fig. 4 — Wiring diagram of the motor-driven tuning section.  $L_1$  is the variable portion of the whip loading coil. A variable inductor from a military Command transmitter is used.  $L_2$  is a matching inductor.  $K_1$  is a 6-volt d.c. d.p.d.t. relay (Guardian 200-5). The motor is a 6-volt defroster motor. The antenna terminal should be connected to the base of the whip with the shortest possible lead.  $L_2$  should have a solid connection to the frame of the car. See text for further details.

ductor, impedance-matching inductor, tuning motor and motor-reversing relay.

The front panel of the control unit contains a three-pole four-position rotary switch,  $S_1$ , Fig. 3, and two pilot-light assemblies,  $I_1$  and  $I_2$ . The switch selects the mode of operation, and the two pilot lights indicate the resonant condition of the antenna. When the right-hand lamp,  $I_2$ , is lighted, it indicates an inductive antenna, and when the left-hand lamp,  $I_1$ , is lighted, a capacitive antenna is indicated. Providing the system is properly adjusted, a resistive antenna will be







The control unit is assembled in a  $4 \times 1 \times 2$ -inch box. The tubes are mounted at the rear, the antenna and transmitter coax connectors on the side, and the switch and indicator lamps on the front.

indicated by both lamps being extinguished.

The three-pole four-position switch utilizes the four positions as follows: (1) off, (2) automatic tuning, (3) manual increase inductance, and (4) manual decrease inductance. During normal operation, the switch will be left in Position 2 except on 10, 15, and 20 meters, where the antenna bandwidth is sufficiently broad that automatic tuning is not necessary. In this case, the switch may be left in the off position. When QSYing from one end of a band to the other, it is not necessary to keep the transmitter on the air while waiting for the antenna to be tuned to resonance. While on automatic position the VFO may be adjusted to the desired frequency, the transmitter output tank adjusted to resonance and note made whether the antenna is inductive or capacitive as indicated by the two pilot lights. The transmitter may then be taken off the air and the control switch placed in one of the two manual positions for an approximate adjustment of the series inductance. The switch may then be returned to the automatic position for an exact antenna adjustment.

### Construction

Inductor  $L_2$ , Fig. 3, consists of 20 turns of No. 18 enameled wire close-wound and center-tapped on a  $\frac{3}{8}$ -inch bakelite rod.  $L_1$  is formed of No. 16 wire and consists of a  $\frac{3}{4}$ -turn loop about  $L_2$ . This provides an optimum value of coupling for 25–50-watt transmitters. Although the coupling between  $L_1$  and  $L_2$  is not critical, it should be reduced as higher transmitter power is employed. A slight change of coupling may be found necessary with different installations.

To facilitate construction procedures, the control unit was assembled and wired with both  $4 \times 4$ -inch covers removed. This simplifies the task of assembling and wiring considerably. As an aid to simplification it is recommended that wires be cabled together where practical, even though it may require greater lead length. Where no

critical circuits are involved, cabling will greatly limit the congestion which is unavoidable with a unit of this size. Of course, the leads to  $L_1$  and  $L_2$  should be kept short and direct.

The tuning motor was originally an automobile defroster motor purchased at a used auto-supply store for \$1.00. It was disassembled and leads brought out for connection to the d.p.d.t. reversing relay. Six- and 12-volt d.c. motors may be wired in a number of ways. Frequently, the armature is connected between the two fields, and the combination placed in series across the automobile battery. In this case the most simple way to provide a reversal of rotation is by reversing the armature connections in respect to the field windings. In other cases a field reversal may be more simply accomplished.

The gear reduction unit was taken from a PE-101 dynamotor where it was originally used to operate an automatic keyer. The variable inductor,  $L_1$ , Fig. 4, was taken from a military Command transmitter. All other components are of standard manufacture and readily available at most radio supply houses. A simple replacement for the entire antenna tuning unit would be a motor-driven variable inductor which is available commercially.

Power for the automatic mobile tuner is taken directly from the mobile transmitter. The filaments are not switched on or off within the unit itself, but are taken directly from the transmitter filament switch. The unit requires 0.9 amp. at 6 volts and 200–400 volts at approximately 15 ma. Satisfactory sensitivity may be realized with voltages as low as 200, although an increase in  $L_1$ - $L_2$  coupling may be found necessary. Voltages over 400 should be avoided because of possible cathode-to-heater break-down in  $V_3$ .

### Adjustment

Provided the antenna system has been properly matched to the transmission line in use, the

(Continued on page 118)

# Vertical Multiband Antennas

## Two Practical Systems with Coax Feed

BY L. L. TAYLOR,\* W8LVK

• The radiation angle from a vertical antenna will be satisfactory for long-distance work over about a 3-to-1 frequency range if the proper antenna length is used. This article offers a solution to the more difficult problem of feeding such an antenna with coax, without excessive loss in the feeder.

ALTHOUGH there is no simple multiband antenna that provides optimum performance with respect to matching a transmission line, systems can be devised which are compromises and can be made to perform fairly well on several bands. This article describes two such vertical antennas, one of which performs quite well on the 10-, 11-, 15-, and 20-meter bands, the other on the 15-, 20-, and 40-meter bands.

It is pointed out in *The ARRL Antenna Book*<sup>1</sup> that vertical antennas do not make satisfactory

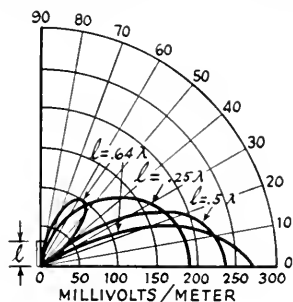


Fig. 1—Vertical-plane field patterns of vertical antennas for several values of antenna height. The field intensity is expressed in millivolts per meter at a distance of one mile for one kilowatt input. Perfectly conducting ground and zero loss resistance are assumed. From Kraus.<sup>2</sup>

multiband antennas because their angle of radiation increases with frequency. This is true except for the region where the vertical antenna is less than 0.64 wavelength long. Between 0.2 and 0.64 wavelength long the radiation angle decreases as frequency increases. This is shown in Fig. 1, which is a field-intensity plot in the vertical plane of a vertical antenna for three different frequencies. These curves assume zero loss resistance in the antenna and a perfectly conducting ground plane. The actual value of resistive loss in the antenna will merely shrink

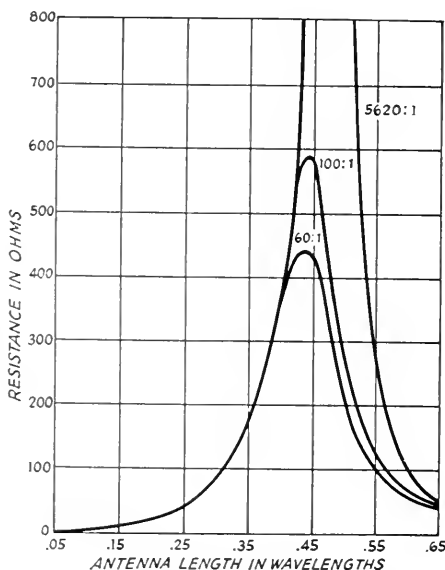


Fig. 2—Input resistance vs. length in wavelengths for vertical antennas of three different length-to-diameter ratios. From Jordan.<sup>3</sup>

the curves slightly but not distort them. A lossy ground plane such as earth will affect the curves at extremely low elevation angles, which will shorten distances for ground-wave propagation,

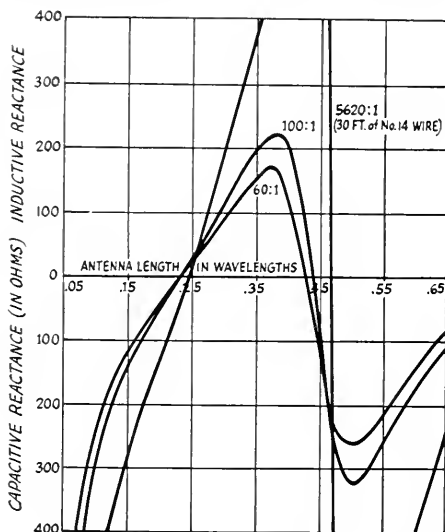


Fig. 3—Input reactance vs. length in wavelengths for vertical antennas of three different diameter-to-length ratios. From Jordan.<sup>3</sup>

\* 319 Summit St., Granville, Ohio.

<sup>1</sup> *The ARRL Antenna Book*, page 186, 5th edition.

<sup>2</sup> J. D. Kraus, *Antennas*, page 317; McGraw Hill Book Co.

<sup>3</sup> Edward C. Jordan, *Electromagnetic Waves and Radiating Systems*, pages 482 and 483; Prentice-Hall, Inc.

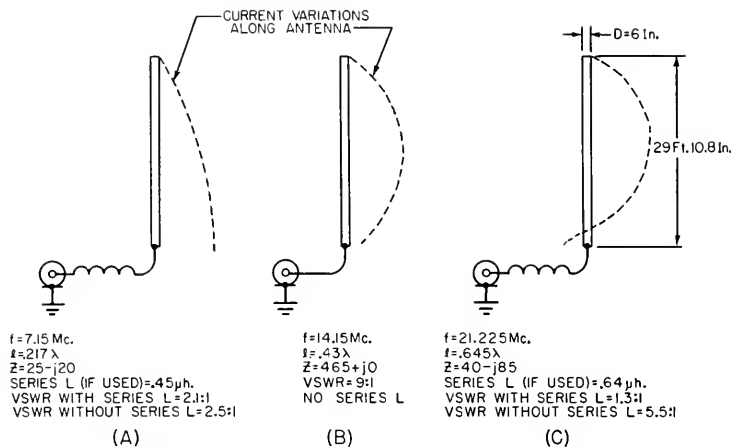


Fig. 4 — Vertical antenna for 7, 14 and 21 Mc.

but will not affect the shape of the curves at angles used by amateurs for sky-wave propagation.

The main objection to an antenna which is operated at different points in this 0.64- to 0.20-wavelength region is the radical change in input impedances between the bands where the antenna is current fed and the band where the antenna is voltage fed. By using a simple construction technique the amateur can approximate a cylindrical antenna of low enough length-to-diameter ratio to reduce materially these variations in impedance. Figs. 2 and 3 show the manner in which input resistance and reactance of a vertical cylindrical antenna vary with frequency in the region where the antenna is less than 0.65 wavelength long, and for antenna length-to-diameter ratios of 60:1, 100:1, and 5620:1. A length-to-diameter ratio of 5620:1 is equivalent to 30 feet of No. 14 wire.

### Practical Antennas

If the vertical antenna can be erected close enough to the rig to minimize transmission-line losses, the two antennas described here can be made to operate very satisfactorily. Fig. 4 shows

a 29.9-foot antenna with a 60:1 effective length-to-diameter ratio that operates very well on 40, 20, and 15 meters. The current distribution along the antenna at the center of each band is represented by the dotted lines. The values of input impedance, optional series inductance which may be used to cancel out the capacitive component of the input impedance, and the voltage standing-wave ratio with and without the series inductance, are all given for the center of each band. The v.s.w.r. values are for the case where the antenna is fed with 52-ohm coaxial cable. With this antenna the series inductance makes very little difference in cable loss; for example, at 7.15 Mc. the loss in 100 feet of RG-8/U cable without the inductance would be 0.62 db. and with the inductance it would be 0.55 db. At 21.225 Mc. the loss without the inductance is 1.9 db. and with the inductance it is 0.83 db. If this antenna is to be used extensively on 20 meters, the length of the feed line is of special importance. With the 9-to-1 v.s.w.r. which exists on 20 meters, the loss in 100 feet of cable will be 2.3 db. This will have the same effect as reducing a 100-watt rig to about 69 watts. With 50 feet of cable the loss will be

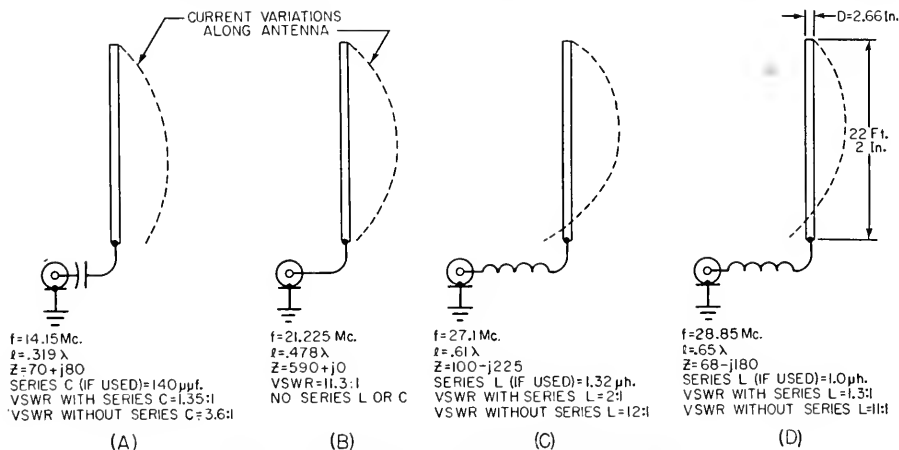


Fig. 5 — Vertical antenna for 11, 21, 27 and 28 Mc.

1.3 db., and with 25 feet of cable it is 0.7 db.

A vertical antenna for the 20-, 15-, 11-, and 10-meter bands is shown in Fig. 5. This antenna is 22.16 feet long with a 100:1 effective length-to-diameter ratio. The series condenser for use on 20 meters is relatively unimportant and may be omitted as it only reduces the loss in 100 feet of RG-8/U from 1.2 db. to 0.75 db.; however, on 11 and 10 meters the series inductance should be used unless a very short run of cable is used between the rig and the antenna. The loss on 11 and 10 meters is 3.7 and 3.6 db., respectively, for 100 feet of cable without inductance, and that loss is reduced to 1.2 and 1.0 db., respectively, when the series inductance is used.

### Construction Notes

The construction of the antenna is fairly simple, as shown in Fig. 6. The box construction with length  $D$  on a side approximates a cylindrical antenna of diameter  $D$ . The diameter of the four vertical wires is not critical, but should be

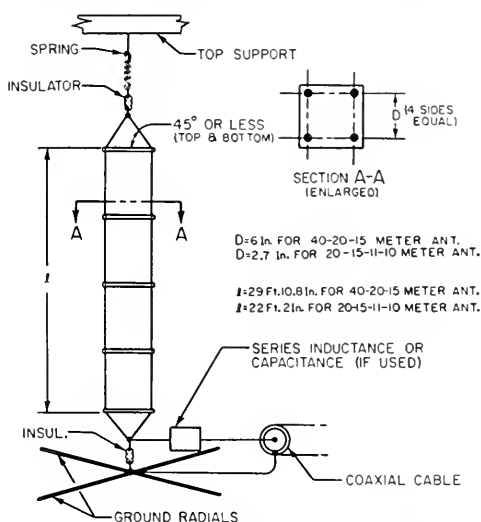


Fig. 6 — Physical construction of antennas.

as large as possible to reduce resistive loss. No. 14 wire is satisfactory and was used by the author, but a larger size would probably be an improvement. Either solid or stranded may be used.

The separators are not critical and may be plastic or treated wood. The spacing of the separators is dependent upon the tension used on the antenna; the more tension used the fewer separators needed. The author used ten separators for each antenna. The spring used at the top to provide the tension was an over-sized screen door spring obtained at the local hardware store.

The series inductances can be wound on any convenient low-loss form, and the size of wire, number of turns, spacing, and coil diameter may be picked to fit the specific installation.

The ARRL Lightning Calculator or any available coil table such as the one in *The Radio Amateur's Handbook*<sup>4</sup> may be used to wind the inductance required. The author found that No. 12 wire on a 1/2-inch synthane tube will work satisfactorily. The coils, if used, must be placed in a waterproof box and a stepping relay used to select the correct coil for each band, or to short out the coil(s) where none are required. The author strongly suggests keeping the coaxial cable short, connecting it directly to the antenna and not using any series reactance.

The use of ground radials is important, as with any vertical antenna. It is recommended that 4 or more buried radials be used and that they be more than 1/4 wavelength long at the lowest frequency to be used. The author has found that four 50-foot sections of aluminum clothesline running at right angles from the base of the antenna work very satisfactorily. One of these radials runs in one window of the basement of the house, along the basement ceiling and out the opposite window. In addition to the radials, a long (6 feet or longer) ground rod should be driven into the ground at the base of the antenna and connected to the junction of the radials and the outer conductor of the coax.

The antenna may be held up by any suitable means, but the most convenient, in most cases, will probably be a clothesline running between two suitable supports such as two trees, a tree and the house, etc.

It must be remembered that, as shown in Fig. 1, the vertical antenna has a low radiation angle; therefore, don't expect it to perform well at short ranges where a high angle of radiation is needed. The author has a horizontal dipole 35 feet above the ground for use on 40 meters. This antenna outperforms the 40-20-15 vertical when working nearby stations (30 to 200 miles) but when the band is open the vertical puts the dipole to shame.

## Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1AHY, ex-1FX, Stephan A. Griffin, Livermore Falls, Me.  
W2JBN, Andrew H. Kuhn, Orange, N. J.  
W4AQN, Harry C. Jones, sr., Harriman, Tenn.  
W4CZZ, Hubert Seeds, St. Petersburg, Fla.  
W5HGP, Raoul S. Dossman, San Antonio, Texas  
W5KOP, Annie L. Porter, Kenedy, Texas  
W5TCI, Joseph E. Watson, Vicksburg, Miss.  
K6EQD, Paul Farmer, Gardena, Calif.  
W6KOV, Louis C. Lamberson, Antioch, Calif.  
W6KTY, Roy Wheadon, South Gate, Calif.  
W6VJQ, John L. Fredenburgh, Alpine, Calif.  
W6YIL, Walter E. Brown, jr., Venice, Calif.  
W6YXI, Josephine N. Fredenburgh, Alpine, Calif.  
W7VKE, Marcus M. Durham, Rigby, Idaho  
W8LWG, Ross E. Dixon, Alliance, Ohio  
W8ROX, George Sangrik, jr., Cleveland, Ohio  
VE1EA, Clarence E. Roach, Halifax  
DLIND, Georg Kohlgruber, Gummersbach  
DL3PO, Anton Plabst, Einfang  
SM5WL, Hans F. Eliaeson, Stockholm  
VP9F, Richard Fox, Saint Davids Island, Bermuda

<sup>4</sup> *The Radio Amateur's Handbook*, page 545, 30th edition; page 543, 31st edition.

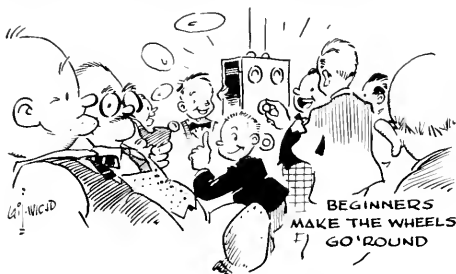
# Six Meters for the Beginner

## Part I — The Nature of the Band

BY EDWARD P. TILTON, W1HDQ

**E**XPERIENCE on the 2-meter band since Novices appeared on the scene has shown us what makes the wheels go around in amateur radio. Today we find Novices and former Novices almost everywhere, enjoying what the band has to offer. Hundreds started on 2 as WNs or KNs and, liking what they found, have stayed there after graduating to General Class status. This has been fine for 2-meter activity, but in attracting the lion's share of all v.h.f.-minded beginners, the 2-meter band has left its next-lower neighbor, the 50-Mc. band, with very little new blood.

The drive of the newcomer is vital to the growth of our hobby. Wherever he congregates, things *happen*; there is no substitute for his



boundless enthusiasm. It was with this thought in mind that the ARRL Board of Directors endorsed the proposal to open the 50-Mc. band to Technician licensees. Let's look over the characteristics of this recently somewhat-neglected band, and see what it has to offer the fellow who is just breaking into the game, at either the Technician or General Class level.

### Why Start on 6?

In v.h.f. circles, activity begets activity. Nothing discourages a potential v.h.f. operator more than to listen in and hear no signals. "There's nobody here," he concludes, "why should I go on?" But if he tunes across the band and hears people talking together he concludes that something interesting is going on, and he feels the urge to join in.

What the casual tuner-inner may misunderstand about the 50-Mc. band, if he finds it unoccupied at the moment, is that it is not *always* quiet. There are 6-meter men scattered all across the country who wouldn't give up the band for anything else in ham radio. They watch the band constantly. Perhaps you don't hear them for weeks at a time, but they're around. Just let a sign of DX show up and they'll be in there soon enough. Others crawl out from under

their rocks for every v.h.f. contest, and disappear promptly again when the party is over.

These are the old-time v.h.f. men, mostly. They have a wonderful time on 6, but their kind of operating is by no means enough to make things interesting for the beginner, or even the casual old-timer. Most hams want merely to talk with someone — and 6 is fine for that too, or it could be if more stations used it for that purpose. In fact, there is probably no better band in all the spectrum for friendly rag-chewing over distances up to 50 miles or more. It may not provide the strongest signals, or the best DX, but it certainly does afford the most consistent communication, within its reliable range, of any band we have.

The 50-Mc. band is in-between territory. It has the reliable coverage of higher v.h.f. bands and, like them, it is almost entirely free of serious interference problems. Yet it is low enough in frequency so that the ionosphere gets into the act now and then, opening the band up for DX that may be international or even world-wide in scope. Essentially, though, it is a local or extended-local band, for the DX is available only a small percentage of the total time each year. DX on 6, then, should be regarded as a spice, added occasionally to a satisfying daily fare, and not as an end in itself.

Even if we ignore DX entirely, the 50-Mc. band has much to interest the beginner. You don't need high power, or a tremendous antenna. You'll never have to peel the signals off in layers to get at the fellow you're trying to work. Equipment is simple to build, and easy to get going. Plenty of operators have enjoyed working on 6 with as little as 5 watts input, and the national average is probably well under 100 watts. Transmitters running more than 300 watts are a distinct rarity on 50 Mc. You may want to build a converter, to get the best possible reception, but a first-class job can be made with as few as two tubes. Circuitry and adjustment procedure are of elementary simplicity, as future articles of this series will show.

### Propagation at 50 Mc.

You'll have more fun and work more stuff on 6 if you acquire at least a nodding acquaintance with the ionospheric and atmospheric factors that affect your coverage. Knowing something of what to expect, and when, is at least half the battle.

One thing you'll notice right away is that signal strength from stations other than locals varies with the weather, and with the time of day. Stronger-than-normal signals, at 50 to

200 miles, and occasional reception up to 300 miles or more, result from bending of the transmitted wave as it passes through a boundary between air masses of differing temperature and humidity characteristics. If warm moist air overruns cold dry air we have the right condition for this kind of bending. It happens fairly often; daily, in fact, in warm weather, especially in areas adjacent to large bodies of water. Air-mass movement on a continental scale (the sort of thing you see recorded on the weather maps) can produce this sort of "inversion" over very large areas.

Good v.h.f. conditions lying along large-scale air-mass boundaries can develop at any season. This helps keep life interesting for the v.h.f. man during the winter months. A likely sign that favorable factors are present is the increasing high cloudiness that follows a period of fair calm weather. The barometer will be fairly high and steady preceding the good period, and it is probable that there will be a slow-moving "low" somewhere a few hundred miles to the west. Signals are usually strongest in the early daylight hours, and around sundown, though varying weather conditions may upset this schedule. Watch the weather maps presented daily on many television stations, or check those appearing in the newspapers, and you'll soon develop the knack of telling when things are going to be better than average on the v.h.f. bands.

Ionospheric DX is less predictable, at the present state of the art, but we know in a general way when it is most likely to show up. The most frequent form results from the reflection of the wave by scattered areas in the *E* region of the ionosphere, some 50 miles above the earth. It can happen any time, but it is most frequent in the early summer months. There is a less-pronounced period in late December and early January.

Sporadic-*E* skip, as it is most commonly known, is one of the 6-meter operator's real thrills. Signals appear suddenly, out of nowhere, and frequently rise to amazing strength. They may stay in for only a few minutes at a time, or the band may remain open for hours. Occasionally in June or July there may be DX signals around the clock. Signals are commonly heard over distances of 500 to 1200 miles, though dense ionization may bring the minimum skip distance down to 300 miles, or even less. Multiple reflections also extend the range to as much as 2500 miles, on occasion. It is thus possible for an alert 50-Mc. operator to work all states, and at least ten have qualified for the special certificate award that ARRL issues in recognition of this accomplishment.

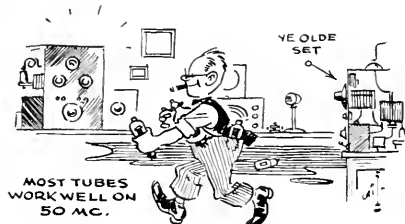
Reflections from the auroral region offer another means of working beyond the normal range on 50 Mc. If you see "Northern Lights" on a clear night, aim your 6-meter array in that direction and you're likely to hear the weirdest-sounding signals you ever imagined. Voice or any other form of modulation is sure to be badly distorted, and may be completely unreadable,

making c.w. the only usable means of communication. Auroral conditions develop most often in the early evening, but they may show before sundown, so you have to watch radio conditions to catch all the opportunities. The distances over which auroral effects are noted extend from a few miles to as much as 800.

Around the peak of the sunspot cycle there is a chance of 50-Mc. DX of world-wide proportions. Between 1946 and 1950 many transatlantic and transpacific contacts were made, and North American stations worked several South American countries on 6. It may seem hard to believe, in these days when 28 Mc. is dead most of the time, and 21 Mc. only partially open, but working international DX was quite a sport on 50 Mc. in the spring and fall months of those years. Distances of 2500 to 5000 miles were common, and contacts were made with as little as 3 watts input! An almost unbeatable record of 10,500 miles was set in 1947.

So you see that just about all the factors that affect lower frequencies influence 50-Mc. communication at times, and in addition, it responds to weather variations. As propagation seldom remains stable for more than a few hours at a time, it is hard to say just what "normal" conditions really are. Perhaps it is better to talk in terms of minimum distances, rather than average, if we want to establish what the potential 6-meter operator may be able to work. Suppose you're going to run 50 to 100 watts input. You don't have room for a big tower, so you're planning to put up a 2- or 3-element rotary that won't stand out among the TV antennas. It will be no more than 50 feet above ground — perhaps less. What can you expect to do on 6?

Unless you're completely surrounded by nearby hills much higher than your antenna, you should be able to work at least 50 miles consistently, with stations similarly equipped. If you have a reasonably open location (not necessarily a high one), so that your antenna "sees" a horizon several miles away, your reliable operating radius should be at least 100 miles, and you should get in some contacts up to perhaps 200 miles when weather is favorable. If you have a hilltop site, and plenty of hams seem to manage it, you will find it possible to keep reliable schedules with well-equipped stations out to 200 miles or more, and 300-mile stuff will not be uncommon.



These very rough figures apply to tropospheric conditions only. Results in aurora or sporadic-*E* work are affected far less by the characteristics

of your location. In either department, the sharp operator in a "poor" v.h.f. location may do just about as well as his more fortunately-situated fellows.

### Equipment

The 50-Mc. transmitter need not be greatly different from gear used on lower bands. Most currently-used tubes work well on 50 Mc., and only a little attention to layout is needed to make an efficient r.f. section for 6. Any recent edition of *The Radio Amateur's Handbook* will give you practical ideas, or there are units you can duplicate, part for part, if you like.

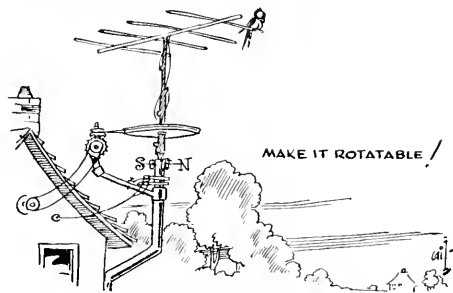
Receiving may be more of a problem. As most hams buy, rather than build, when it comes to receivers, the lack of suitable ready-made gear has kept quite a few hams from enjoying 6 in recent years. Several commercial receivers have a "50-Mc. band" but few of them do a passable job. There are present indications of a change for the better, but you may have to build your own "front end" if you want to receive as far as you can transmit. If your receiver is the single-conversion variety, and nearly all more than two years old are, it probably won't "have it" for 50-Mc. work, without a converter. A few double-conversion jobs on the market show fair 50-Mc. performance, but all are in the higher-priced brackets. If your receiver is low- or medium-priced you're sure to need a converter, even though the receiver dial does indicate 50-Mc. coverage.

Fortunately, construction and adjustment of a 50-Mc. converter need frighten nobody. And if your receiver is in good working condition it doesn't make too much difference if it happens to be 15 years old, or one of the low-budget jobs. The *Handbook* can be your guide as to converter designs, and we have some new units in the works here in the ARRL lab. They will be tailored to the beginner's needs, and you'll be seeing them soon in *QST*.

The antenna is probably the most important part of the 50-Mc. station. Investment in the antenna system will yield greater returns than time and money spent elsewhere in the 6-meter station. You can work a radius of 25 miles or so with an indoor folded dipole, but you'll never know how much fun the band can be until you put up something better. In these days of inexpensive TV rotators and arrays on every roof, a 6-meter beam is within the reach of almost everyone. Whatever you put up for an antenna, make it rotatable. There is nothing more unsatisfactory, in most locations, than a fixed antenna. It will always be aimed in the wrong direction when your friends on 6 are working something good!

Even if you plan only a single element, arrange to be able to turn it. A dipole works surprisingly

well if it can be kept broadside to the desired incoming signal. But if you can put up a good dipole, with provision for rotation, you can add



at least one parasitic element. That first one really pays off, too, and even a 2-element beam will do a real job for you, if it is fed properly. Additional elements are worth the effort, too, if you can manage them. Make the antenna as big and as high as you can. Your *Handbook* gives you all the necessary design details.

### Problems — If Any

With our band at 50 to 54 Mc., and TV Channel 2 at 54 to 60 Mc., it is rough on the 6-meter man when his community gets a Channel 2 TV station. It may be rougher in a Channel 2 fringe area. TV receivers are just not capable of slicing it that thin. But there are many areas that do not have Channel 2 service, and for these the 50-Mc. band is relatively free of TVI problems. If moderate power is used and the rig is designed so as to prevent harmonic radiation<sup>1</sup> there is a very good chance of avoiding TVI entirely.

If some is encountered it is easy to cure. The writer has operated on 50 Mc. consistently since long before television, much of the time with high power, without running into any TVI problems that could not be solved readily. If you live in a 40-family apartment house you may not want to try it, but if you can manage 100 feet clearance from your neighbors' TV antennas, operating on 6 should pose no threat to neighborhood peace. You may have to put a 300-ohm stub on here and there, but unless you're blessed with Channel 2 you'll need nothing more pretentious in the way of TVI-preventive measures than a few scraps of Twin-Lead. Even in Channel 2 areas, the problem is by no means hopeless, as W21DZ showed recently in *QST*.<sup>2</sup>

Here, then, is the 50-Mc. picture, presented in the frankest possible terms. As one of the band's long-time regulars, the writer feels — with several hundred other die-hards — that anyone who has not given 6 a real try has missed one of the great experiences that ham radio has to offer. We hope that in years to come many newcomers will share this opinion. To help them along the way, we've been working for some time on several transmitters and receivers designed especially for the beginner. You'll be seeing them in forthcoming issues of *QST*.

<sup>1</sup> Tilton, "TVI Hints for the V.H.F. Man," April, 1953, *QST*. Also 1954 and 1955 editions of *The Radio Amateur's Handbook*, Chapter 23.

<sup>2</sup> Ladd, "50-Mc. TVI — Its Causes and Cures," June and July, 1954, *QST*.



The transmitter covers 160 through 10 meters, and uses standard chassis and bottom plates to provide complete shielding for TVI. The panel is 7 by 19 inches.



## Easy Shielding for Ninety Watts

*The 'Bandbox' and a 6146 Pi-Network Amplifier*

BY RICHARD L. BALDWIN,\* WIIKE

• This is a neat little package combining Don Mix's "Bandbox" frequency-multiplying unit with a 6146 amplifier using a continuously-variable inductor in a pi-network tank. The construction is such that the unit is self-shielding for TVI — with only one very simple metal piece requiring fabrication.

**T**HIS RIG has two virtues which should recommend it to those who like to build their own gear. First, it is completely and rapidly bandswitched from 160 through 10 meters, without plug-in coils; and second, it is of a mechanical design that allows a maximum of TVI reduction with a minimum of sheet-metal work.

\* R.F.D. 1, Cumberland Center, Maine.

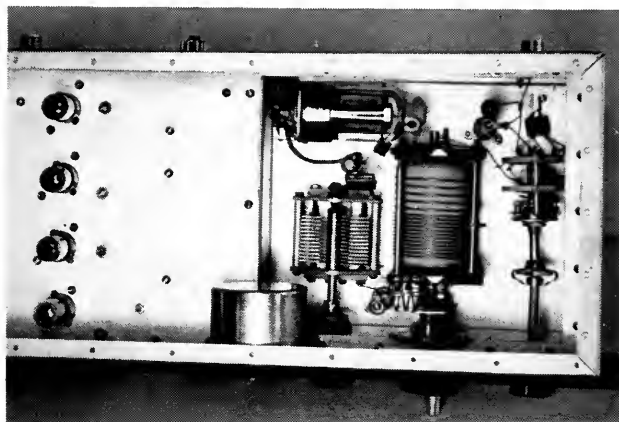
<sup>1</sup> Mix, "The 'Bandbox' — A Single-Control Frequency Multiplier," *QST*, April, 1952. See also p. 52, *QST*, September, 1952.

### Circuit

An inspection of the circuit diagram, Fig. 1, will show you that there is nothing new and tricky here. The front end of the transmitter consists of Don Mix's "Bandbox," slightly modified electrically by the addition of another switch section so that if a VFO with 160-meter output is available, that VFO output can be applied to the grid of the final tube. It was also modified mechanically to fit this particular layout. The final tube is the popular 6146, with a variable inductor and pi network so that no coils have to be changed when shifting bands.

TVI has been reduced to a minimum by complete shielding, by the use of shielded wire for all d.c. leads, and by appropriate by-passing of all leads leaving the chassis. A coil shield covers the meter, and the only possible "hole" is the socket on the rear panel for the power plug. But all leads there are by-passed and no r.f. can be detected leaking out.

The amplifier is set in a "dish" (see Fig. 3) in a cut-out section of the two back-to-back chassis. This view is looking down into the transmitter with the top plate off. The tubes in the "Bandbox" exciter section are at the left.



## Layout

Looking at the transmitter from the front, the exciter portion occupies the left half of the chassis, while the final occupies the right half. The panel controls, reading from left to right, are the bandswitch controlling the exciter, exciter tuning, the meter switch, plate capacitor for the 6146, variable inductor for the 6146, and the switch for the loading capacitors. The meter is in the upper center, while a chart in the upper left attempts to balance the extra counter dial on the variable inductor.

Along the rear of the chassis are the coax connector for VFO input, the power socket, and the coax connector for r.f. output.

Looking at the top of the transmitter, we see the tubes for the exciter standing at attention at the left, with the shield can for the meter front and center. The final is set in a "dish," with the variable inductor right in the center, the tube left rear, variable capacitor left front, and loading capacitor switch at the right. In order to obtain better operation at 10 meters and in order to cover 160 meters at all, inductance  $L_6$  is broken up into three sections.  $L_{6A}$

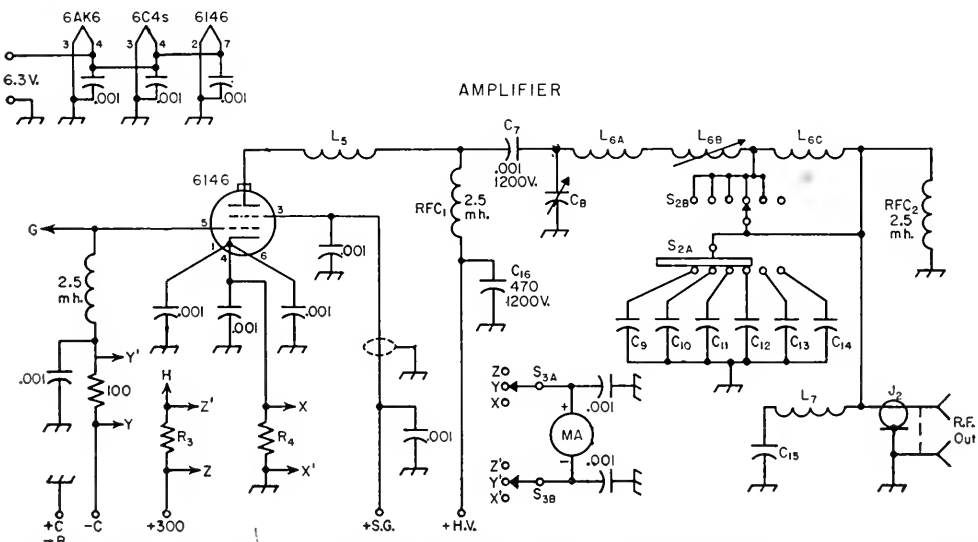
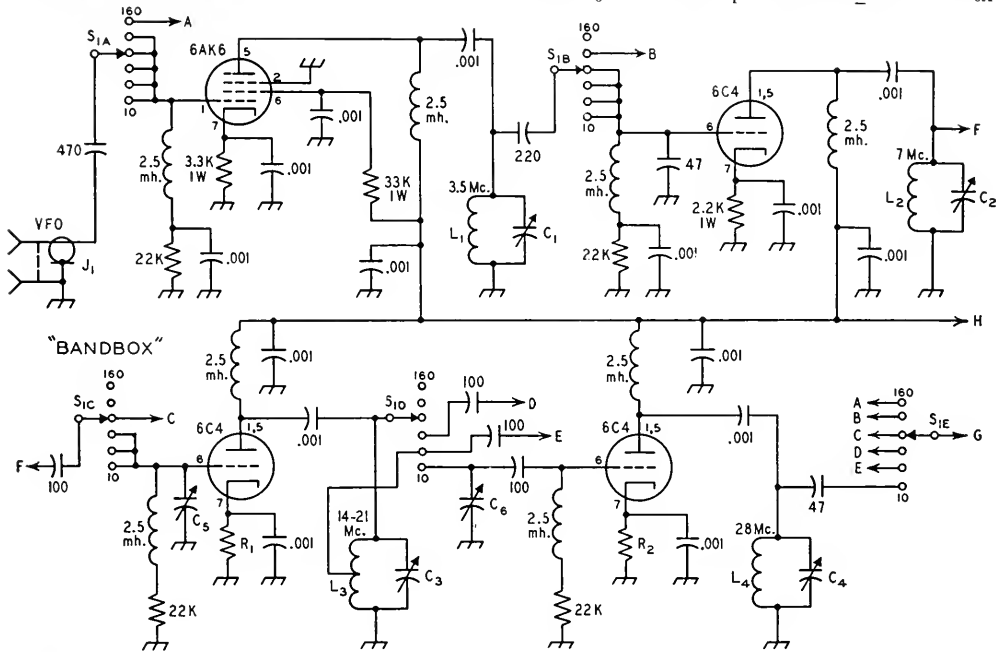


Fig. 1 — Wiring diagram of the transmitter. The section above the dashed line is the "Bandbox" frequency-multiplier unit. All resistors  $\frac{1}{2}$  watt unless otherwise specified. Capacitor values below 0.001  $\mu\text{f.}$  are in  $\mu\text{mf.}$  All 0.001- $\mu\text{f.}$  capacitors except  $C_7$  are 500-volt disk ceramic; others are mica.

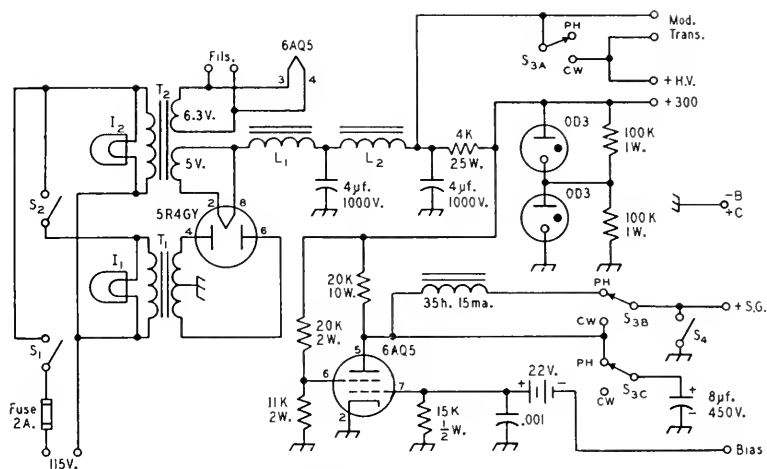


Fig. 2 — Power-supply and clamp-tube circuit.

$L_1$  — Swinging choke, 5-25 henrys, 20-200 ma. (Triad C-31A).  
 $L_2$  — Smoothing choke, 10 henrys, 200 ma. (Triad C-16A).  
 $S_3$  — 3-pole 2-position ceramic switch, nonshorting (Centralab 2507).

$I_1, I_2$  — 115-volt pilot lamp.  
 $T_1$  — Plate transformer; for 750 v. d.c., 225 ma. (Merit P-3159).  
 $T_2$  — Filament transformer: 5 v., 3 amp. and 6.3 v., 6 amp. (Stancor P-5009).

consists of four turns of B & W Miniductor No. 3009, and resonates in the 10-meter band when  $L_{6B}$  is shorted out by running the contactor all the way down to the end. Operation on 15 meters through 80 meters is accomplished with  $L_{6A}$  working in series with  $L_{6B}$ , with  $L_{6B}$  being adjusted for more and more inductance as we progress from 15 to 80 meters.  $L_{6C}$  consists of  $1\frac{3}{4}$  inches of B & W No. 3907, which, in conjunction with  $L_{6A}$  and  $L_{6B}$ , will resonate on 160 meters. It was removed for the photographs because it hid too many of the other components. It is customarily supported between the rear terminal on  $L_{6B}$  and the pillar insulator (National GS-3) located at the right rear of  $L_{6B}$ . On bands other than 160 meters it is shorted out by an extra wafer section ( $S_{2B}$ ) of the loading-capacitor switch.

The circuit of the power supply used in conjunction with the transmitter is shown in Fig. 2. A pair of 816s was used originally, but they generated a hash on 80 meters which would not clear up with any of the combinations of filter tried, and so they were replaced with the single 5R4GY. The clamp circuit is one that has been described several times in recent issues of *QST*.

The VFO that has been used with this rig has a couple of 6AG7s in a Clapp oscillator and buffer, and is keyed with a Millisec relay according to Goodman.<sup>2</sup>

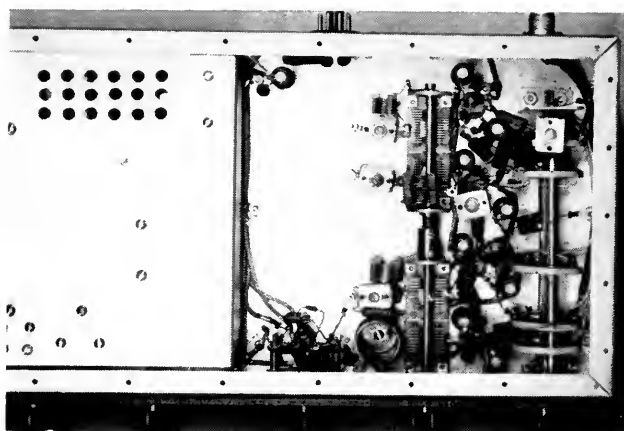
### Construction

In order to obtain complete shielding, two  $3 \times 8 \times 17$ -inch chassis were bolted together back to back, or top to top, depending upon how you look at it. The Bandbox exciter is then built in the left-hand portion of the resulting

<sup>2</sup> "Improved Break-In Keying," *QST*, March 1948.

$C_1$  — 65- $\mu$ f. variable in parallel with 100  $\mu$ f. silver mica.  
 $C_2$  — 35- $\mu$ f. variable in parallel with 3-30- $\mu$ f. mica trimmer and 47- $\mu$ f. silver mica.  
 $C_3, C_4$  — 25- $\mu$ f. variable in parallel with 3-30- $\mu$ f. mica trimmer.  
 $C_5, C_6$  — 3-30- $\mu$ f. mica trimmer.  
 $C_7$  — Mica.  
 $C_8$  — 300- $\mu$ f. variable, 0.026" spacing (National TMS-300).  
 $C_9, C_{10}$  — 100- $\mu$ f. mica  
 $C_{11}, C_{12}, C_{13}$  — 200- $\mu$ f. mica  
 $C_{14}$  — 500- $\mu$ f. mica  
 $C_{15}$  — 100- $\mu$ f. mica (see text).  
 $C_{16}$  — Mica.  
 $R_1$  — Two 4700-ohm 1-watt resistors in parallel.  
 $R_2$  — 4700-ohm 1-watt in parallel with 3300-ohm 1-watt.  
 $R_3, R_4$  — Meter shunts; see text.  
 $L_1$  — 12  $\mu$ h.; 24 turns No. 22 d.c.e., 1-inch diam., close-wound.  
 $L_2$  — 4.2  $\mu$ h.; 17 turns,  $\frac{3}{4}$ -inch diam.,  $\frac{1}{32}$  inch long (B & W Miniductor No. 3012).

$L_3$  — 1.8  $\mu$ h.; 12 turns,  $\frac{3}{4}$ -inch diam.,  $\frac{3}{4}$  inch long tapped 6 $\frac{1}{2}$  turns from ground end (B & W Miniductor No. 3011).  
 $L_4$  — 0.4  $\mu$ h.; 7 turns,  $\frac{1}{2}$ -inch diam.,  $\frac{7}{16}$  inch long (B & W Miniductor No. 3003).  
 $L_5$  — 8 turns No. 18,  $\frac{1}{4}$ -inch diam.,  $\frac{5}{8}$  inch long.  
 $L_{6A}$  — 0.3  $\mu$ h.; 4 turns,  $\frac{3}{4}$ -inch diam., 1 inch long (B & W Miniductor No. 3009).  
 $L_{6B}$  — 10- $\mu$ h. variable (Johnson 229-201).  
 $L_{6C}$  — 11  $\mu$ h.; 18 turns No. 16, 2-inch diam.,  $1\frac{3}{4}$  inches long (B & W No. 3907).  
 $L_7$  — See text (forms TV harmonic trap with  $C_{15}$ ).  
 $J_1, J_2$  — Coax connectors  
 $S_1$  — Ceramic switch; 5 sections, 6 positions.  
 $S_2$  — Ceramic switch; 2 sections, 6 positions; Centralab P1S section (for  $C_9$ - $C_{14}$ , inc.) and type X section (for  $L_{6C}$ ).  
 $S_3$  — Bakelite wafer switch; 2 poles, 3 positions.  
Note:  $C_1, C_2, C_3$ , and  $C_4$  are ganged. See Reference 1 or *The Radio Amateur's Handbook*, 1953 or 1954 edition, for method of adjusting tuned circuits for proper tracking.



The exciter section extends along one end of the chassis, as shown in this bottom view. The bottom of the amplifier dish is at the left. The switch at lower center is the meter switch.

enclosure, exactly as previously described by Mix, except for the extra switch section and except for a mechanical rearrangement so that the dials would line up symmetrically along the panel. The cut-out for the final is 7 inches wide and 8 inches long, and a shelf to support the components for the final hangs down  $2\frac{3}{4}$  inches below the cut-out. Fig. 3 shows the

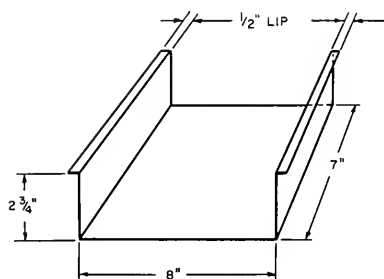


Fig. 3—The "dish" for the final amplifier. It is bent from aluminum sheet.

dimensions of this shelf, as its configuration is not clearly shown in the photos.

The 6146 is mounted on a small bracket at the left rear of the shelf. Capacitor  $C_8$  is in front of the tube, mounted on a couple of small aluminum spacers so that its dial will be in line with the others. Between  $C_8$  and the tube are  $RFC_1$  and  $C_7$ . Parasitic choke  $L_5$  is supported between the junction of  $C_7$ - $RFC_1$  and the tube plate cap.  $C_{16}$  is connected to the high-voltage lead at the power plug where the lead leaves the chassis. Coil  $L_{6A}$  shows up poorly in the photos, but is supported by a National GS-3 pillar insulator (mounted to the left and in front of the variable inductor) and the terminal of the variable inductor. It is at right angles to  $L_{6B}$ , the roller coil.

At the right rear edge of the variable inductor is the GS-3 insulator which normally supports  $L_{6C}$ , and directly behind that is the safety choke  $RFC_2$ . Switch  $S_2$  is at the far right; one section switches the loading capacitors which are clustered to the rear of the switch and the other

section shorts out  $L_{6C}$  on all bands other than 160 meters, as mentioned earlier. Just barely visible in the photograph is the coil portion of the harmonic trap  $L_7C_{14}$ .

Top and bottom plates are 8 by 17 inches, and are secured by  $\frac{1}{4}$ -inch 6-32 screws spaced every 2 inches around the edges of the chassis. The chassis material is rather light, but if care is used it may be drilled and tapped with good results. Just don't tighten up on the 6-32s too strenuously. The 7-inch panel is held to the chassis by the various tuning controls and panel bearings, and by the bolts which hold the meter and meter shield in place. The meter shield is an ICA No. 1540 coil shield, cut down so that it is only 2 inches high.

The only other piece of mechanical work that is at all unusual is the counter for the variable inductor. At the time this transmitter was conceived the only counters obtainable took up more room on the panel and behind it than was available, and so a homemade counter was contrived using Boston gears Nos. G142 and G148, some G29 pinion wire, two panel bearings, a couple of aluminum brackets, and a surplus dial. Fig. 4 shows the method of assembly. The

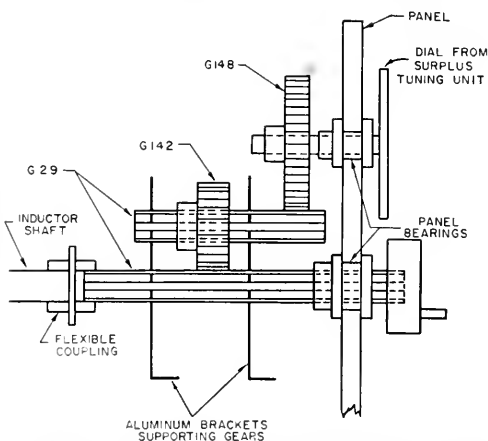
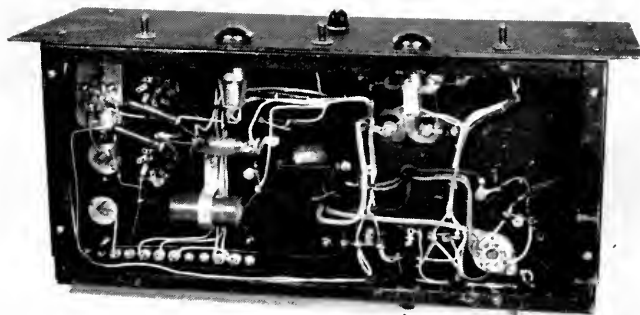


Fig. 4—Sketch of drive and indicator for the final-tank variable inductor. The gears are standard items.

Miscellaneous small parts in the power supply are mounted below chassis, as shown in this photograph.



counter dial on the panel was taken from a surplus tuning unit, and was mounted by drilling and tapping the shaft on which the G148 spur gear was mounted. Incidentally, the spur gears come with hubs which have to be drilled and tapped in order to allow fastening to the shafts.

Now for a few miscellaneous notes on the construction and wiring. You should do all necessary by-passing and other wiring at the 6146 tube socket before mounting it and its bracket in position. There is not enough room to get down between it and the edge of the shelf with any ordinary soldering iron. A series of  $\frac{1}{4}$ -inch holes is drilled below the tube in the shelf, in line again in the bottom plate and in the top plate, to provide ventilation for the 6146. The now-standard practice of using shielded wiring on the d.c. leads is followed in this rig, with plenty of bonds to the chassis at convenient points. The meter shunts were wound by trial and error, using a rheostat, battery, and full-range milliammeters to determine the shunts needed. The shunt for measuring exciter current extends the 10-ma. range of the meter to 100 ma., while the shunt for the 6146 plate current extends the range to 200 ma. No shunt is needed for the 6146 grid current. The panel markings are Tekni-Cals.

### Operation

Adjustment of the exciter has been fully covered by Mix, and so need not be detailed further. It might be mentioned, however, that the exciter worked right from the moment plate voltage was first applied, and the process of aligning it was very simple. Thus, if the speci-

fications in the original article are followed you will have no difficulty with that part of the circuit.

In the final the harmonic trap is adjusted by resonating the  $L_7$ - $C_{15}$  combination to your local TV channel. Do this by shorting the coax-connector terminals and coupling  $L_7$  to a grid-dip meter. In my case  $L_7$  consists of three turns of No. 18 wire wound to a  $\frac{1}{4}$ -inch diameter, while  $C_{15}$  is 100  $\mu\text{f}$ .  $L_7$  was then adjusted until the circuit hit Channel 6.

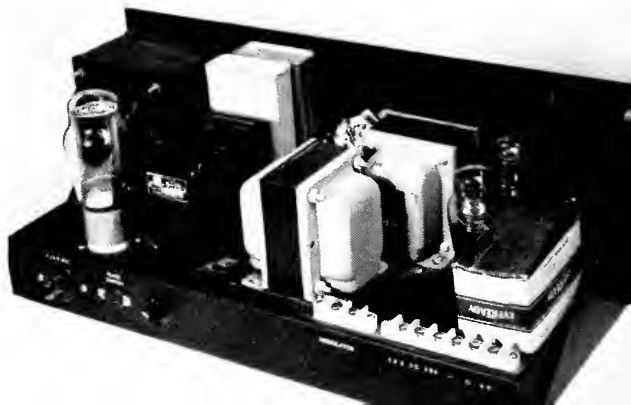
The values of the loading condensers were picked by going back to the early articles on the pi network. I had to make no further adjustment, and so in this case blind luck triumphed over science.

The 80-meter band is tuned with all of  $L_{6B}$  in the circuit, 40 is tuned with about 12 turns of  $L_{6B}$  in the circuit, 20 meters with about 7 turns, and 15 meters with about 5 turns. For 10 meters,  $L_{6B}$  is shorted out altogether by running the contactor all the way to the end of the coil. These adjustments could vary depending upon what kind of load your transmitter has to feed.

A word of caution about the 6146 is in order. It appears that this tube is particularly susceptible to overloads, and so you should exercise care not to allow it to operate off-resonance; otherwise, you will soon end up with a tube exhibiting grid emission.

This rig has been used by itself, with an antenna coupler, as a very nifty low-power transmitter. It was used with success during the 1953 and 1954 SS contests, and the TV receiver in the next room never knew it was on the air. It has also been used to drive a pair of triodes running a kilowatt input.

Major components of the power supply, which is built on an  $8 \times 17 \times 2$ -inch chassis. The voltage regulator tubes, clamp tube and bias battery are at the right-hand end in this view. The "plate switch" socket beside the 115-volt connector on the chassis lip is wired in parallel with the front-panel plate switch and is for remote control of the plate voltage.



# A One-Tube Receiver for the Beginner

## *The 6U8 in a Regenerative Receiver*

BY LEWIS G. MCCOY, W1ICP

• The easiest way to break into the receiver-construction game is to build a regenerative receiver. Here is a "one-tube" regenerative receiver that is easy to put together and has performance equal to any in its class. And, after all these years, it has an honest-to-goodness antenna coupling circuit.

JUDGING from the mail here at Headquarters, it would appear that one of the many questions facing the newcomer is whether to buy or build his first receiver and transmitter. The answer to that depends on whether one is interested in just operating or in learning about radio. If you want to understand radio, the only real way to acquire experience is by building your own equipment. At least at the beginning.

This article describes the construction of a simple one-tube regenerative receiver that will fulfill the basic requirements for communications work. The title of the article states that the receiver is a one-tube job. Actually, it uses two tubes in one envelope—envelope meaning the glass enclosure. The 6U8 is a triode-pentode, and in this receiver the pentode section is used as a regenerative detector and the triode portion as an audio amplifier.

With this receiver it is possible to hear amateur and commercial stations in the 2- to 20-Mc. range. This tuning range will enable the builder to listen to the two low-frequency Novice bands. Also, if one is interested in obtaining code practice, W1AW, the ARRL Hq. station, can be tuned in for its nightly code-practice sessions.

### *The Circuit*

The circuit used in this receiver differs in a few places from the usual regenerative-receiver circuit. For example, instead of the usual small antenna-coupling capacitor or inductor, provision

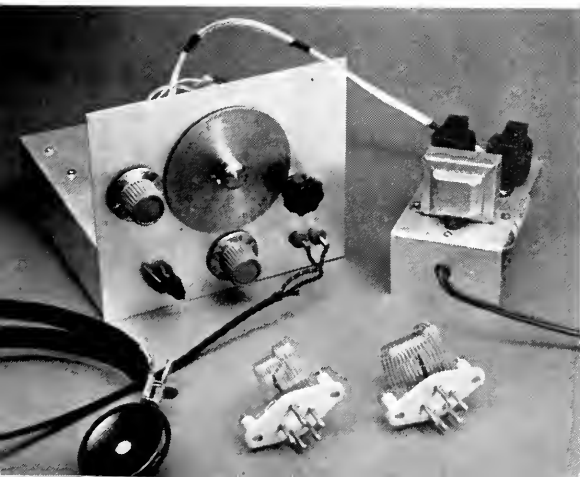
was included here for either a series- or parallel-tuned antenna circuit. This allows a wide range of coupling adjustments to be obtained, as is often necessary with regenerative receivers.

Referring to Fig. 1, the antenna coil,  $L_1$ , couples the signal to the detector tuned circuit  $L_2C_2C_3$ . The capacitor,  $C_2$ , is larger than  $C_3$  and is used as the "bandset" capacitor—once  $C_2$  is set for a particular frequency range,  $C_3$  is used as the "bandspread" tuning control. To facilitate using manufactured coils, the coil  $L_2$  is tapped to obtain a feed-back or "tickler" winding. Regeneration in the detector is controlled by changing the screen voltage obtained at the potentiometer  $R_1$ . An r.f. filter, using two capacitors and an r.f. choke, is placed in the plate circuit of the pentode detector to reduce r.f. appearing at the grid of the triode audio amplifier. Still further attenuation of r.f. at the grid is obtained through the use of a series resistor and a shunt capacitor right at the grid of the audio stage. To save a little money, the audio coupling choke,  $L_3$ , is made from an inter-stage audio transformer with the two windings connected in series. A high-inductance choke could be used here, but the series-connected transformer does a good job and is less expensive.

The headphones are connected directly in the plate circuit of the audio stage, and consequently the plate voltage appears at the terminals—you can get an electrical shock here if you aren't careful. Some receivers eliminate this hazard by feeding the plate through an audio choke and coupling to the headphones through a capacitor, but again in the interest of saving a few dollars this protective feature was not included. In any event, be sure to use "high-impedance" headphones with this receiver—the low-impedance headphones that have been available in surplus will not work well in this particular circuit.

### *Construction*

The receiver is built on a  $7 \times 7 \times 2$ -inch aluminum chassis, with the power supply mounted on



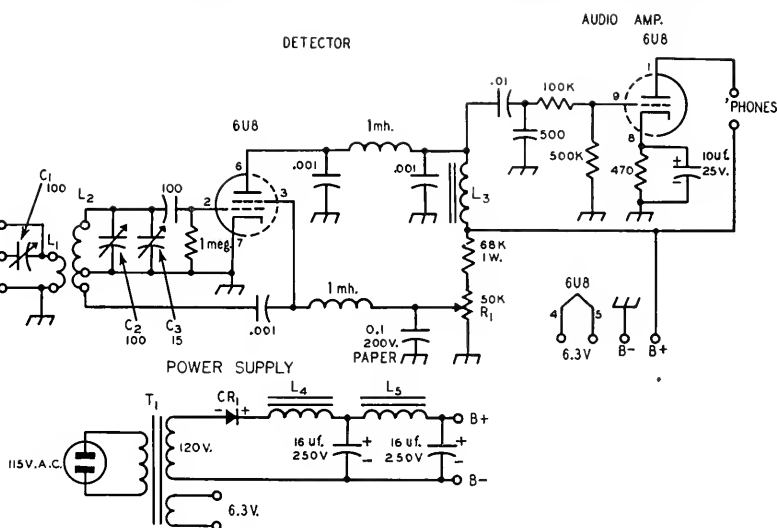
Front view of the receiver and power supply. The control at the upper left is the general-coverage tuning, center is bandspread, lower left the regeneration control, and the bottom center the antenna trimmer.

and the headphone tips are at the lower right. The knob at the upper left is for the general-coverage capacitor, and the one at the right the bandspread tuning. The dial shown in the photograph is the National type K. This has a rim drive and gives a desirable slow tuning rate.

The first step is to mount the coil and tube sockets. They are spaced 2 inches from the sides at the center of the chassis. Ground lugs should be mounted under the nuts that hold the tube socket and also under the rear nut holding the coil socket. Next, the panel holes are drilled.

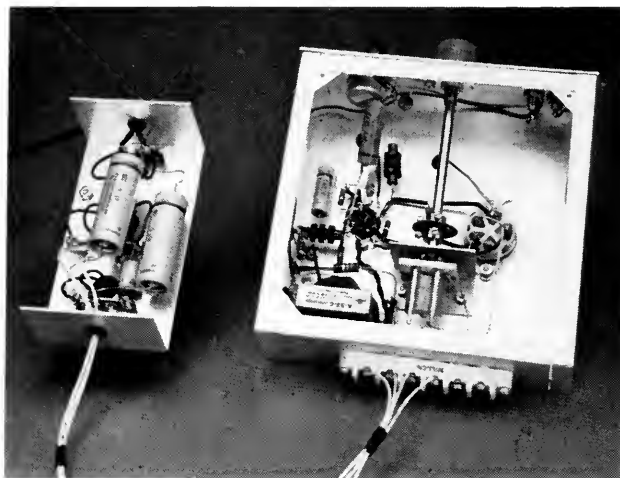
Looking at the photograph showing the panel front, the knob at the lower left is the regeneration control, lower center is the antenna trimmer,

The two capacitors,  $C_2$  and  $C_3$ , should then be



*Fig. 1* — Circuit diagram of the one-tube regenerative receiver. See page 138 for parts list.





Bottom view of the two units. At the lower left in the receiver is the interstage transformer  $L_3$ . To the right of  $L_3$  is the antenna-trimmer capacitor mounted on a right-angle bracket. Immediately in front of the bracket is the insulated shaft coupler which connects the through-shaft bushing to the antenna trimmer.

The selenium rectifier in the power supply is visible between the two electrolytic capacitors.

ins. allied on the panel. If the Type K dial is used, a template is furnished with the dial assembly to give the correct placement points for the dial and rim drive. When the potentiometer  $R_1$  and the pin jacks are mounted in place, they will hold the panel to the chassis. Be sure to insulate the pin jacks from the panel and chassis with fiber washers. The through-shaft bushing is measured and cut to size, making allowance for the insulated coupler. The receiver is now ready for wiring.

### Wiring

If this is your first construction project, there are a few tips about wiring and soldering that will help you do a good job. First, be sure the end of the wire to be soldered is completely clean of insulation or enamel. Solder should not be depended on to hold the connection. Whenever possible, wrap the wire around the connection before applying solder. Hold the tip of the iron against the work until the work is hot enough to melt the solder. Where most beginners make a mistake is in holding the solder to the iron tip and not getting the connection hot enough for the solder to melt and hold. Don't use any more solder than necessary to make the connection. After a connection is soldered, dispose of the loose bits of solder and wire to avoid short circuits to other connections.

Although it is not shown in the diagram, it is important that a separate ground lead be connected to the rotors of  $C_2$  and  $C_3$  and the lead brought below the chassis to a common grounding point at the tube socket. This will help make the receiver stable and reduce hand capacity.

There are five leads coming from the interstage transformer: red, blue, black, and two green. The red lead and green lead that are directly opposite each other are connected together. After the leads are soldered and taped, the end of the black lead is also taped. These leads are then rolled up and tucked in the corner of the chassis. The remaining blue and green leads then become those used for wiring the series-

connected transformer into the circuit. One is connected to the junction of the 0.01- $\mu$ f. disk capacitor and the 1-millihenry r.f. choke and the other lead is connected to the B+ voltage terminal.

The Barker & Williamson coils are mounted on five-prong plugs, although only four of the contacts are used. The link mounted at one end of the coil is  $L_1$  and the coil proper is  $L_2$ . To make the tickler tap, a short piece of hook-up wire approximately 3 inches long is soldered to the fifth prong on the plug. The piece of wire is then run through the middle turns of the coil and soldered to the tap point. For the 80-meter coil, the tap is connected to the 8th turn in from the link end. To get the tap wire through the middle turns of the coil, it will be necessary to bend two or three turns of the coil in towards the center of the coil. This will provide sufficient clearance for the tap lead. It is also necessary to bend in the 8th turn to make the tap connection. Be sure that none of the bent turns touches adjacent turns.

For maximum bandwidth on 40 meters, it is necessary to remove nine turns from the 40-meter coil. The turns are taken from the end opposite the link end of the coil. The tickler tap is made on the 4th turn end from the link end.

To bandwidth the 20-meter coil, two turns are removed from the end opposite the link end. The tap is placed on the 4th turn from the link end. In all three coils, the tap lead should be insulated where it passes through the coil turns.

### Power Supply

The power-supply components can now be wired. There are two important points that beginners should keep in mind when wiring the supply. The first is that the electrolytic capacitors should be wired with the leads marked with a minus sign, or negative, connected to the chassis. The plus sign, or positive, connects to the choke leads. Likewise, the selenium rectifier is marked with a plus sign, and this lead is connected to the

(Continued on page 136)

# A Compact Two-Tone Test Generator

## Dual A.F. Phase-Shift Oscillators for Modulation Checking

BY ROBERT F. TSCHANNEN,\* W9LUO

• This unit provides two audio frequencies of your choice for checking the performance of a linear amplifier. In case you use any of the various two-tone techniques that require only one audio frequency, or want a low-distortion tone for a.m. testing, just use one-half of the circuit diagram.

THE true performance of a single-sideband exciter and linear amplifier is difficult to predict without a few pieces of test equipment. Probably the most important item of test equipment for this purpose is the oscillograph; however, a most useful and helpful companion unit is a low-distortion audio source — better still, a pair of audio sources.

The "Two-Tone Test Generator" described below is designed to provide two independent low-distortion audio test signals. The unit is small and compact and uses only two tubes. No special components are used in the construction of the unit. If the generator is carefully made and adjusted, the total harmonic distortion can be as low as 0.1 per cent.

### The Basic Circuit

The basic circuit of a phase-shift oscillator is shown in Fig. 1. Operation depends upon producing 180-degree phase shift in the RC network consisting of three capacitors and three resistors; sufficient gain must be produced by the oscillator tube to make up for the loss in the network. For

the circuit shown, a gain of 29 times is required to sustain oscillation (Reference 1, bibliography). The frequency of oscillation is determined by the equation

$$f = \frac{10^3}{2\pi\sqrt{6RC}} = \frac{10^{12}}{15.4RC}$$

where  $R$  is in ohms and  $C$  is in micromicrofarads. If the oscillator tube has a gain less than 29, oscillation will not begin; if excessive gain is obtained, appreciable distortion may be produced.

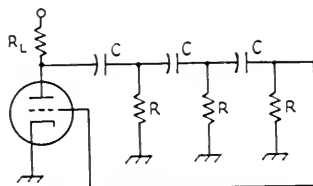


Fig. 1 — The basic phase-shift oscillator circuit.

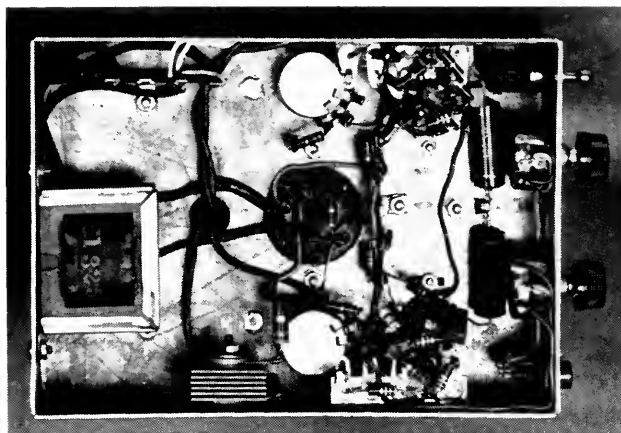
The phase shift through the network at harmonic frequencies is always less than 180 degrees and in some cases approaches zero. This gives rise to negative feed-back which reduces the gain at harmonic frequencies; therefore, essentially a pure sine wave results. Maximum harmonic reduction occurs at the point where the system is just able to sustain oscillation.

### General Circuit Description

A single 6AN8 tube is used as oscillator and output section for each channel of the generator. The pentode section functions as the oscillator

The two-tone test generator is a compact and inexpensive unit and provides two audio signals of different frequencies and equal amplitudes for testing any type of s.s.b. generator. Distortion is extremely low if proper care is used in adjustment.





Arrangement of parts below chassis. The two oscillator-buffer circuits are identical in circuit but not in component values. The three electrolytic condensers in the power supply are contained in a single can-type unit (Mallory 311.9) thus conserving space underneath.

proper; the triode section operates as a cathode follower output. A half-wave selenium rectifier followed by considerable filtering provides good d.c. for the oscillators. The complete schematic is shown in Fig. 2.

The 1000-ohm controls in the cathode circuits of the pentode stages are used for controlling distortion. The controls permit adjustment of the oscillator tube gain to the point where oscillation will just be sustained. This also corresponds to the point where minimum distortion occurs. Two additional 1000-ohm controls in the cathodes of the triode cathode followers provide control of outputs from either channel.

The  $R$  and  $C$  component values for the networks shown in the schematic of Fig. 2 are approximately correct for the generation of 400- and 1000-cycle tones. Other values are given in Table I.

It is important that the linearity of the cathode follower be good since otherwise distortion may be added by this stage. The use of a low- $\mu$  triode tube such as the triode portion of the 6AN8 permits the handling of higher grid swings without distortion. Since the signal handled is small, the possibility of distortion becomes negligible. The effective output impedance of the cathode follower is approximately equal to

$$\frac{10^6}{g_m}$$

in shunt with the cathode resistance to ground (where  $g_m$  is the transconductance in micromhos). The output impedance is therefore of the order of only several hundred ohms. This is desirable since output signals may readily be coupled into a combining network without appreciable interaction. The tapped-down take-off point from the plate of each oscillator tube reduces external loading on the oscillator and

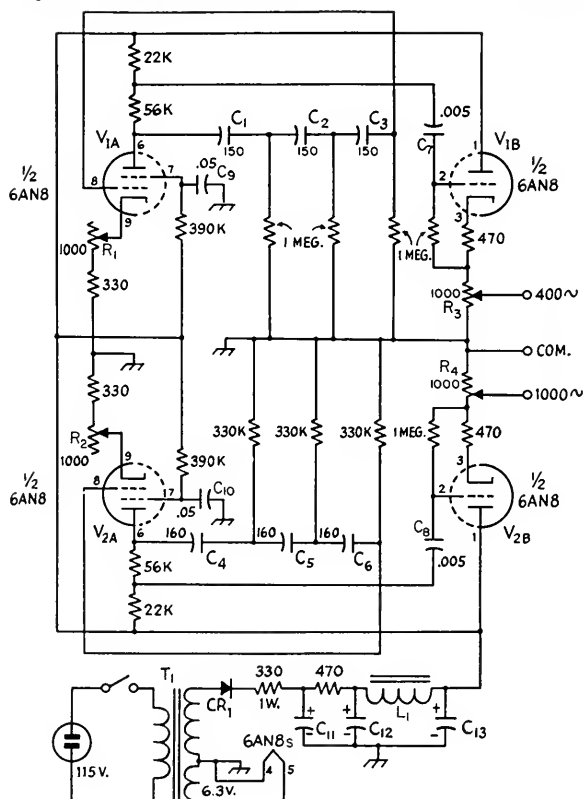


Fig. 2 — Circuit of the dual a.f. test oscillator. Resistors are  $\frac{1}{2}$  watt, 10 per cent tolerance, unless otherwise specified. Capacitance values below 0.001  $\mu$ f. are in  $\mu$ mf. Potentiometers are linear-taper 1-watt composition.

C<sub>1</sub>-C<sub>6</sub>, inc. — Silver mica, 5 per cent tolerance.

C<sub>11</sub>, C<sub>12</sub> — 120- $\mu$ f. 250-volt electrolytic.

C<sub>13</sub> — 40- $\mu$ f. 250-volt electrolytic.

L<sub>1</sub> — 5 henrys, 50 ma. (Stancor C-1325).

CR<sub>1</sub> — 75-ma. selenium rectifier.

T<sub>1</sub> — 125 volts, 50 ma.; 6.3 volts, 2 amp. (Stancor PA-8421).

also reduces the output level to the point where the cathode-follower grid circuit can handle the signal without distortion.

When used for lowest distortion, the output of either channel is of the order of 1 to 1.5 volts r.m.s. Output levels of 8-10 volts r.m.s. are obtainable if a few per cent distortion is tolerable. The increased output capability is obtained by readjusting the oscillator cathode resistance.

The total "B" current drain of both oscillators and output stages is about 16 ma. Line-voltage variations do not greatly influence the

TABLE I		
Freq. (c.p.s.)	R	C μmf.
250	1 meg.	260
300	"	216
350	"	186
400	"	162
500	680 K	191
600	"	159
800	"	119
1000	390 K	166
1250	"	133
1500	"	111
2000	270 K	120

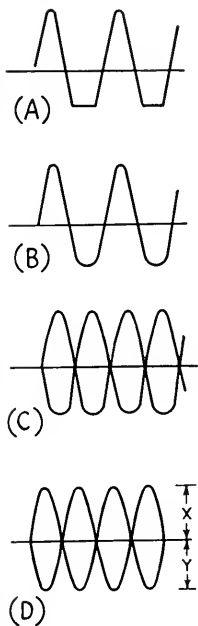


Fig. 3 — Improper operating conditions are shown by 'scope traces. A — Excessive oscillator tube gain. B — Excessive oscillator tube gain, but not as much as in A. C — Same as B except with change in 'scope sweep speed to facilitate estimating second-harmonic distortion by the degree of asymmetry ( $X$  greater than  $Y$ ). D — Optimum symmetry ( $X = Y$ ), minimum even-order harmonics, low distortion in output.

oscillator frequency; therefore voltage stabilization is not required. Larger screen by-pass and coupling capacitors do not add particularly to the performance of the unit since fixed-frequency operation is used.

Typical voltage readings taken with a d.c. v.t.v.m. are as follows:

- 1) B+ at output of filter = +120 to +130 volts.
- 2)  $E_{sg}$  = +30 to +40 volts.
- 3)  $E_p$  = +55 to +80 volts.
- 4)  $E_k$  (pentode) = 0.2 to 0.3 volt.
- 5)  $E_k$  (triode) = 6 to 7.5 volts.

### Construction

The chassis layout of the phase-shift oscillator is not critical. The entire unit is constructed on a  $5 \times 7 \times 1\frac{1}{2}$ -inch chassis. The grid leads of the oscillator tubes are preferably kept short and dressed away from a.c. supply and filament leads. One side of each filament of the 6AN8 tubes is grounded. The photographs of the chassis will assist the builder in making a suitable layout. The small power transformer is capable of supplying as many as four individual oscillators. If desired, a 6X4 rectifier may be substituted in

place of the selenium rectifier; in this case the 330-ohm 1-watt current-limiting resistor in series with the rectifier may be removed.

Miniature silver mica capacitors were used in the phase-shift networks for compactness; however, conventional micas may be used successfully if space is available. The coupling capacitors  $C_7$  and  $C_8$  may be Hi-K disk ceramic or paper types. Components for the phase-shift network are mounted on terminal strips or boards for rigidity and neatness. The capacitors  $C_1$  through  $C_6$  are not visible in the bottom view since they are beneath the terminal strips which are located on each side of the chassis. The controls  $R_1$  and  $R_2$  are located on each side of the electrolytic filter capacitor. The output controls, a.c. switch, and output tip jacks are on the front flange of the chassis. The layout shown will provide good accessibility to nearly all components.

### Adjustment & Checking

After the wiring has been completed and checked the unit may be turned on and each output observed on a 'scope. If no output appears, adjust the cathode resistor of the oscillator to just slightly beyond the point where oscillation starts.

With the values of cathode resistances shown on the schematic, it should normally be possible to stop oscillation near one end of the control and produce high (but slightly distorted) output near the other end of the control. At the point where the distortion becomes noticeable, the wave will usually have an appearance similar to that shown in Fig. 3A or 3B, which indicates even-harmonic distortion (principally second). If a distortion meter or wave analyzer is available it will be simple to adjust each cathode control to the point where lowest distortion is obtained. Since such equipment is seldom available to the ham or experimenter, a reasonable means of minimizing the distortion is to apply the signal under test to the vertical plates of a 'scope and adjust the horizontal sweep speed until a pattern similar to Fig. 3C is obtained. The distortion control can now be rotated until dimensions  $X$  and  $Y$  are as nearly equal as possible (see Fig. 3D). In other words, if  $X$  and  $Y$  are made equal, any asymmetry due to second harmonic distortion is negligible.

(Continued on page 120)

# The All-Electronic "Ultimatic" Keyer

## Part II — How It Works

BY JOHN KAYE,\* W6SRV

• Part I (QST, April, 1955) of this article described what the key does and how it can be built. Here is the explanation of the circuits and pertinent test data. Part I is required, since it carries the circuit diagram.

THE electronic Ultimatic is best considered as two separate units, a code generator and a selector-memory-sequencor (SMS). The generator is composed of a time base, two character-generating triggers, and a relay-control tube or an optional d.c.-output tube for direct control of vacuum-tube keyers. The SMS comprises a twin-lever key, two memories, two interlocked-sequencor circuits, two multiple-character holding circuits, and two sequence-seizure circuits. This SMS structure is completely symmetrical. One side only will be discussed. Each paragraph concerning it can also serve to describe the other side by substituting "dot" for "dash" and vice versa and considering the corresponding circuit components. Refer to Part I for the circuit diagram. To extend the stability range, grid-current loading is used in several places. For this reason, some of the voltages to be cited will differ from those calculated from straight voltage-divider action of resistor strings.

### Time Base

The multivibrator,  $V_1V_2$ , generates a sufficiently-square wave at its cathodes from which  $C_2R_4$  differentiates alternate positive and negative pulses for operation of the generator triggers. The "mark/space" ratio of this type of oscillator has been found to be substantially independent of plate voltage over a wide range, and consequently, no voltage regulation is required. The elevated grid return of  $V_1$  provides a mark/space ratio of 45/55 with  $R_3$  at ground, increasing to 90/10 before failure as the arm is moved toward the cathodes. A capacity of 0.05 $\mu$ f. at  $C_1$  gives a minimum speed below 5 w.p.m. and a maximum above 100. Heaven forbid anyone turning it loose on me!

### Relay Output

During spacing, the relay is energized because the grid of  $V_3$  is held at ground potential at the junction of  $R_{12}$  and  $R_{13}$ . The normal "back" contact is used to key the external circuit. On "mark" the junction of  $R_{12}$  and  $R_{13}$  drops to -15 volts, cutting off  $V_3$ . Relatively heavy spring tension on the relay minimizes armature travel

time. When the grid of  $V_3$  returns to ground potential for spacing, the current through  $V_3$  is sufficient to open the contact promptly. Slower armature travel at this time, caused by the stiff spring, is of no consequence. With 0.004-inch armature travel, this method of relay operation results in practically zero variation in the mark/space ratio to, fantastic as it may sound, well above 100 w.p.m.

### Idle Code Generator

$V_5V_6$  and  $V_7V_8$  are cathode-coupled triggers, with  $V_6$  and  $V_7$  conducting in the idle condition. Voltages of +15 and +12 stand on  $R_7$  and  $R_{15}$ , respectively. When the output is to remain spacing, both sequencors,  $V_{10}$  and  $V_{11}$ , are cut off, with cathodes held at +1.7 and +.9 by  $R_{22}$  and  $R_{23}$ , to compensate for the negative contact potentials in the control claspers  $D_1$ ,  $D_2$  and  $V_4$ . Positive pulses from  $C_2R_4$  are clamped at +.9 to the grid of  $V_8$  by  $D_2$  and  $R_{16}$ . The junction of  $R_{10}$  and  $R_{11}$  holds the grid of  $V_4$  at its cathode potential of +1.7, clamping positive pulses to the grid of  $V_5$  at +2.2 volts. These pulse amplitudes are too low to affect the triggers. Negative pulses are not affected by the dot control  $V_4R_6$ , but are grounded out by  $D_1R_{16}$ .

### Dot Generation

When the output is to be a dot,  $V_{10}$  is made conductive by SMS action, establishing +10 volts at  $R_{24}$ . This effectively cuts off  $V_4$ , whose grid does not rise above +8 volts at  $R_{10}R_{11}$ . The first succeeding positive pulse from  $C_2R_4$  rises to +10 volts at the grid of  $V_5$  to transfer conduction to that tube. The resultant drop across  $R_8$  transmits a 60-volt negative pulse toward the grid of  $V_7$  via  $C_4$  and  $R_9$ . This cuts off  $V_7$  and transfers conduction to  $V_8$ . The junction  $R_{12}R_{13}$  stabilizes at -15 volts to cut off  $V_3$ , releasing the relay for marking output.

The following negative pulse cuts off  $V_5$  and returns conduction to  $V_6$ . As  $V_5$  cuts off, a positive pulse is transmitted via  $C_4$  to the grid of  $V_7$ , to return conduction to that tube. The junction of  $R_{12}$  and  $R_{13}$  returns to ground potential, and  $V_3$  pulls up the relay for spacing output.

Even if the key is held closed, with a constant +10 volts standing on  $R_{24}$ , the output cannot again go to marking until the next positive timing pulse, ensuring a full half cycle of spacing output to complete the dot.

### Dash Generation

When the output is to be a dash,  $V_{11}$  is made conductive by SMS action, and +10 volts

\*2296 West Nicolet, Banning, Calif.

stands on  $R_{25}$ . The first positive pulse from  $C_2R_4$  rises to +10 volts at the grid of  $V_8$ , transferring conduction from  $V_7$  to  $V_8$  and the output to marking. The following negative pulse toward the grid of  $V_8$  is grounded by  $D_1$ , and  $V_8$  remains conductive.

Conduction in  $V_8$  reduces the potential at  $R_{15}$  to +2.2 volts. The voltage at the junction of  $R_{10}$  and  $R_{11}$  drops to -0.5 to cut off  $V_4$ , whose cathode now stands at +0.9 volts. (The cut-off voltage is low because the plate voltage is only about 10 volts.)  $C_5R_{14}$  delays this drop until well after the first positive pulse has decayed at the grid of  $V_5$ . The second positive pulse can now trip  $V_5V_6$  to  $V_5$  conduction.  $V_3$  continues to conduct, of course. The second negative pulse cuts off  $V_5$ , which returns conduction to  $V_7$  and the output to spacing. The output cannot again go to marking until the next positive pulse, ensuring the half cycle of spacing to complete the dash after  $1\frac{1}{2}$  cycles of marking output.

When conduction is first transferred from  $V_7$  to  $V_8$ , a 19-volt negative pulse is transmitted from the grid of  $V_7$  toward the plate of  $V_5$  via  $C_4$ , but  $R_9$  limits it to insufficient amplitude to upset stable conduction in  $V_6$ . If SMS action has transferred sequencor conduction to  $V_{11}$  by the time of the second positive pulse in the dash, the elevation of the cathode of  $V_4$  is only incidental, since the drop at  $R_{10}R_{11}$  has already cut off  $V_4$ .

### Automatic Spacing Characters

As in the relay model, interletter and interword spacing characters are obtained by allowing one or two positive pulses to go by. Closure of a key at any time following a passed-up positive pulse produces marking output beginning at the next positive pulse.

### Memory Actuation

The dot-memory trigger  $V_{13}V_{14}$  idles with  $V_{13}$  conducting. This is the opposite tube of the pair from that in the code generators, facilitating the use of readily-derived positive memory-clearance pulses and a simple sequencing structure. While idle,  $C_{12}$  discharges and  $C_{13}$  charges through  $R_{31}$ . Closure of the dot key lifts the grid of  $V_{14}$  on charging current to  $C_{12}$  to the +10-volt value standing at  $R_{37}R_{38}$ .  $C_{13}$  discharges immediately and ensures  $C_{12}$  action despite a possibly scratchy contact at the key. The comparatively slow (2 millisecond) charge rate of  $C_{13}$  through  $R_{31}$  prevents unwanted memory actuation from contact scratch as the key is released. The grid of  $V_{14}$  rises from -13 volts and stabilizes at +10 volts with  $V_{14}$  conducting. The key may be immediately opened and the dot selection will be stored in the actuated trigger until cleared by appearance of the dot at the output.

### Memory Clearance

The dot memory is cleared under control of  $D_3R_{34}$  by a positive pulse to the grid of  $V_{13}$ ,

generated by  $C_{11}R_{36}$  from the  $V_3$  plate swing as the output goes to marking. To prevent spurious memory retrip,  $D_7$  grounds the negative pulse generated as the output goes to spacing.

Only one sequencor tube can conduct at a time. If the output character following the time of dot storage is to be a previously-selected dash,  $V_{11}$  conducts and only +1.7 volts stands at  $R_{24}$ . The clearance pulse toward the dot memory is clamped to that amplitude by  $D_3R_{34}$ , insufficient to clear the memory. When  $V_{10}$  is conductive for dot output, the pulse is allowed to rise to +10 volts at the grid of  $V_{13}$  and return conduction to  $V_{13}$  to clear the memory. The dash memory  $V_{15}V_{16}$  behaves identically, with clearance under the control of  $V_{11}D_6R_{35}$ .

### Sequence Interlock

When the dot memory is idle and the dot key is open, the junction of  $R_{30}$  and  $R_{32}$  applies -13 volts to the grid of  $V_{10}$ , via  $R_{21}$  and  $R_{31}$ , to cut off the tube. Tripping of the dot memory applies +10 volts from  $R_{30}R_{32}$  toward the grid of  $V_{10}$ . If  $V_{11}$  is being held conductive by a positive selection potential from the dash memory or key, its plate current through  $R_{13}$  lowers the potential at  $R_{19}R_{20}$  to -7 volts. The positive potential directed toward the grid of  $V_{10}$  by a dot selected under this condition is clamped by  $D_3R_{21}$ , and the grid of  $V_{10}$  is held below cut-off. This guarantees prior transmission of an earlier selected dash.  $C_7$  stabilizes the negative interlock voltage against spurious releases by plate voltage fluctuations caused by line-voltage changes and distributed capacitive couplings. This is necessary at very low line voltages, where the interlock potential drops to around -3 volts.

With the dash memory clear and the dash key open,  $V_{11}$  is cut off by -13 volts at  $R_{33}R_{40}$ , and  $R_{19}R_{20}$  stands at +12 volts. This allows the +10-volt dot selection potential to reach the grid of  $V_{10}$  via  $R_{21}$ . The cathode of  $V_{10}$  rises to +10 volts to start a dot on the next positive time-base pulse, and permits the memory clearance pulse to reach the grid of  $V_{13}$ . Conduction through  $V_{10}$  and  $R_{27}$  lowers  $R_{28}R_{29}$  to -7 volts, to clamp at  $D_4R_{26}$  any subsequently selected dash until after the dot starts. Additionally, by thus locking out  $V_{11}$  and holding  $R_{25}$  and the cathode of  $D_6$  at +0.9 volts, clearance of the dash memory (when actuated after dot storage but before that dot starts) is prevented.

For a series of dots, the key is held closed and +10 volts from  $R_{37}R_{38}$  holds  $V_{10}$  conductive via  $R_{21}$  (and  $V_{11}$  locked-out) after the dot memory clears at the start of the first dot, until the key is released or the sequencor is "seized" by subsequent actuation of the dash memory. The similar structure of the dash sequencor behaves identically under interlock control of the dot sequencor, to provide single or multiple dashes.

### Sequence Transfer

Assume a dot and a dash, selected in that order before any output starts, and the keys

(Continued on page 122)

# • Recent Equipment —

## The Sonar CD-2 Transmitter-Receiver

As its name implies, the Sonar CD-2 was designed especially for civil defense radio service. As one of the few v.h.f. amateur-band pieces of gear presently approved by the Federal Civil Defense Administration for matching funds, it is of more than ordinary interest. To qualify for FCDA approval, v.h.f. equipment must comply with fairly stiff specifications as to frequency stability and selectivity.

Achieving the required stability in the transmitter was probably no great problem; crystal control and reasonable care in mechanical and electrical design take care of that. But adequate selectivity in a 2-meter receiver runs to some appreciable complication, and when selectivity is achieved, oscillator instability is likely to be something of a headache. A glance at the block diagram, Fig. 1, will show how these matters are handled in the CD-2.

The receiver uses ten tubes. The front end has a 6BK7 series caseode, for low noise figure, followed by a 6AK5 pentode. Self-tuned coupled circuits are used between the second half of the caseode and the 6AK5 grid, and between the 6AK5 plate and the first mixer. Coupling between these circuits is adjusted to give the desired flat response across the band, and the series of circuits gives reasonably high attenuation of signals outside that band. Oscillator stability is assured through the use of a voltage-regulated oscillator-doubler arrangement, with a self-tuned circuit in the doubler plate lead, and very light coupling between the oscillator and doubler.

Output from the first mixer is at 10.7 Mc., and there is one stage of i.f. amplification at this frequency. Then follows a 6U8 mixer-oscillator,



The Sonar CD-2 transmitter-receiver case is designed especially for civil defense station needs. The drop front has a plywood insert to make a writing surface. Space for log, message blanks, microphone cables and other accessories is provided, and the cover and front lock together to prevent unauthorized use.

the latter crystal-controlled, converting to 455 kc. Two stages of i.f. at 455 kc. work into a conventional diode-triode combination that performs the functions of detection, a.v.c., noise limiting and audio amplification. The receiver ends up in a 6AQ5 power audio stage, where a choice of speaker, 'phones-with-speaker, or 'phones alone is afforded.

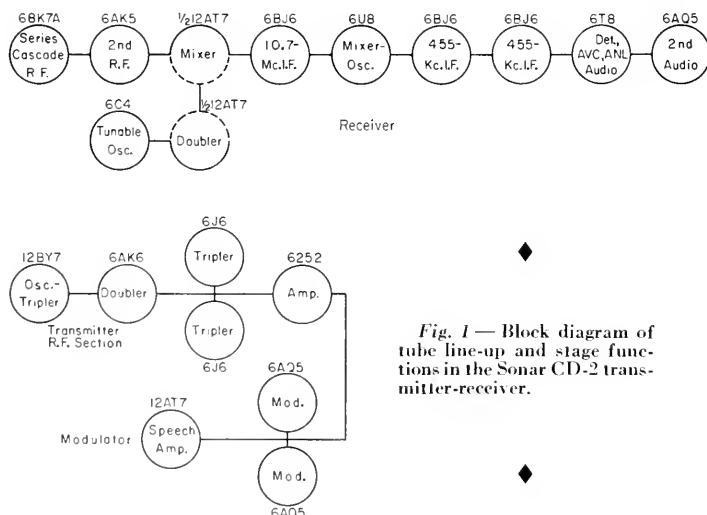
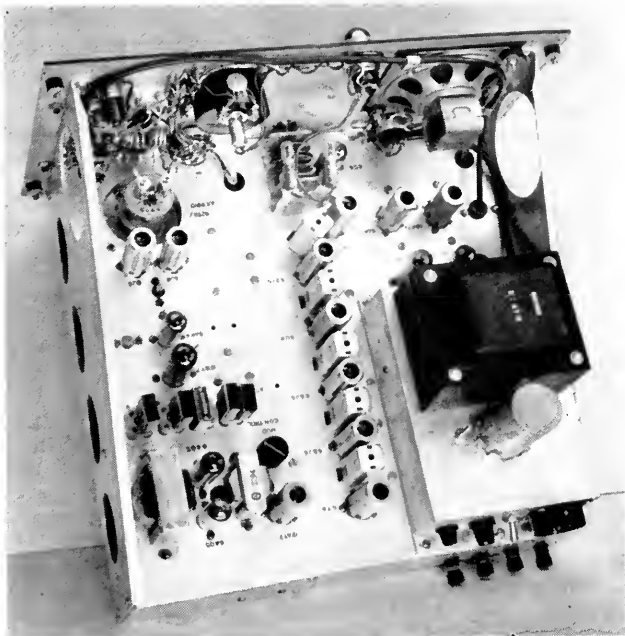


Fig. 1 — Block diagram of tube line-up and stage functions in the Sonar CD-2 transmitter-receiver.

The transmitter line-up consists of a 12BY7 crystal oscillator-tripler, using 8-Mc. crystals, a 6AK6 doubler, a pair of 6J6s in push-pull-parallel tripling, and a 6252 as a straight-through amplifier on 144 Mc. Inductively-coupled double-tuned circuits are used in the last three stages to provide essentially flat response across the band and good attenuation of unwanted oscillator-multiplier frequencies. The rated



Interior of the CD-2. Transmitter components are at the left; receiver and power supply on the right.



output of 17 watts seems quite conservative and is readily developed.

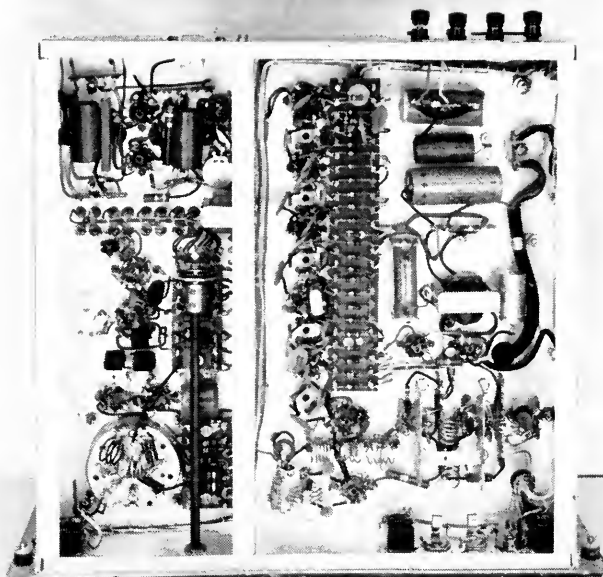
Modulation is supplied by a pair of 6AQ5s, driven by a 12AT7. A Type F1 carbon button microphone is used, and there is provision for either push-to-talk or toggle-switch control of the send-receive operation. A small amount of r.f. output is coupled off at the antenna connection to an r.f. voltmeter to provide for tuning up. Indication of transmitter tuning is shown on a meter, which doubles as a tuning meter for reception, and in addition there is a red jewel light that indicates both output and modulation. The circuit used for these purposes is reproduced in Fig. 2.

### *Tuning & Adjustment*

In keeping with its intended service, the CD-2 is designed so that a minimum of adjustment is required in normal operation. Alignment adjustments of both transmitter and receiver are preset, and should not require adjustment except in case of parts failure or other damage. In the case of the receiver,

the operator merely turns the calibrated dial, and adjusts the audio level to suit conditions. Maximum downward swing of the meter indicates proper tuning of a signal.

The transmitter has provision for eight crystal-controlled channels, selection being made with a single front-panel switch. The only tuning adjustments are the final plate tank and the antenna series-tuning capacitors. A front-panel "calibrate" switch applies screen voltage to the crystal oscillator, when the station is in the



Bottom view of the Sonar transmitter-receiver. Receiver and power supply occupy the large section.

"receive" position, to permit checking the operating frequencies and the receiver calibration against each other. The harmonic from the crystal oscillator in the 144-Mc. band is strong enough to make an appreciable dip show on the tuning meter as the receiver is tuned across the operating frequency.

The CD-2 housing and accessories are designed for its rôle as a civil defense control station.

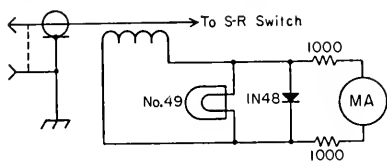


Fig. 2 — Tuning indicator circuit used for checking transmitter adjustments in the CD-2. In the complete circuit, the meter is also switched to indicate strength of the received signal.

The drop front and hinged top lock together with a cut key, so that unauthorized use can be prevented. The bottom portion of the case has ample space for log, message blanks, spare cables and other small accessories. The front cover has a large plywood insert, to provide a writing surface for field use. The cover can also be removed readily, to save space in a permanent installation. Carrying handles are provided on the sides of the case. The shelf on which the

chassis rests is copper plated, to provide good contact with the chassis, and it is made of expanded metal for full ventilation. The front panel has a shaded desk light that can be turned on or off by a toggle switch.

The power supply works on either 6-volt d.c. or 115-volt a.c. input, separate cables being plugged into a single receptacle on the rear wall of the chassis. The socket is reached through a hinged door in the back of the cabinet. Selenium rectifiers are used, this being the first instance we've seen where they have been applied to amateur gear of this power rating. The result should be superior regulation, and an appreciable saving in drain when the rig is run from a 6-volt source. An operating check of the unit showed the total drain from a 6-volt storage battery to be 20 amperes on receiving and 33 on transmitting. Extended use with storage-battery power should not be attempted unless a satisfactory means of charging is at hand, as output drops rapidly after the first 5 minutes of use from a fully-charged battery.

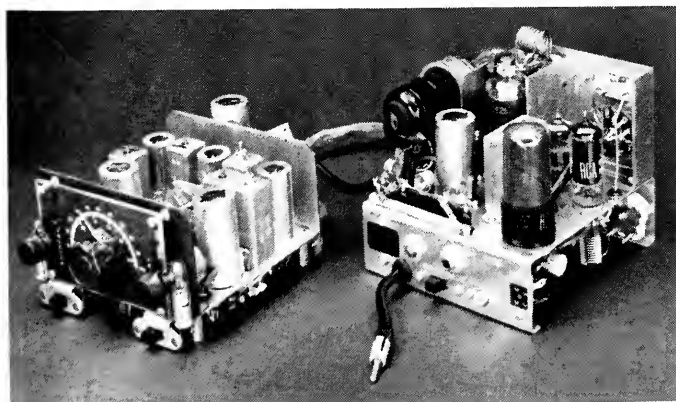
The manufacturer supplies the CD-series gear for any 4.5-megacycle segment of the spectrum from 50 to 180 Mc., so a CD-6 is also available for use in the amateur 50-Mc. band. Both amateur band units may be expected to find considerable acceptance in areas where c.d. planning is well organized, and supported by local or state-wide governmental agencies. — E. P. T.

## The Gonset 6-Meter Communicator

**I**F lack of suitable ready-made gear has been a factor in the present rather low state of activity on the 6-meter band, here's a complete package that should go a long way toward injecting new life into what could be one of our most interesting slices of the r.f. spectrum. Certainly the 2-Meter Communicator has become one of the most familiar features of the v.h.f. scene. This has come about because it combines in one small convenient unit many features that make for pleasant and effective 2-meter work.

The new 6-meter model is physically an almost

exact duplicate of the popular 2-meter job. It is built, insofar as possible, around the same components and subassemblies that are used in the 2-meter rig, and it has the same useful gadgets. These include a tuning eye that works on both transmitter and receiver; a crystal spotter, for checking transmitter frequency and receiver calibration; an adjustable squelch, for quieting the receiver during stand-by periods; universal power supply, for both mobile and home-station use; the option of either carbon or crystal microphone input; provision for use of the audio system



The double-conversion receiver unit, left, and combined transmitter and audio system, right, are little more than good-sized handfuls.



The 6-Meter Communicator by Gonset is physically an exact duplicate of its 2-meter counterpart. Individual adjustment of all transmitter stages is made through holes in upper left side of the front panel, proper setting being indicated by closure of the tuning eye. Receiver has squelch-level, volume and noise-limiter controls, lower left.

for public-address work; and many other features.

In addition, there are innovations that help the 6-Meter Communicator cope with conditions different in several respects from those encountered in 2-meter operation. The receiver is a double-conversion job, providing considerably better selectivity than the single-conversion 6-Mc. i.f. in the 2-meter receiver. The tuning range is extended one megacycle below the edge of the band, permitting monitoring of the mobile services in the 49-Mc. region for signs of band openings. Enough use of these frequencies is made in most parts of the country so that something will be heard almost any time that sporadic-*E* or *F*<sub>2</sub>-layer skip is present. There is a built-in low-pass filter, connected permanently in the antenna lead, to reduce harmonics from the transmitter and spurious responses in the receiver.

For obvious manufacturing reasons, the transmitter has the same tube line-up as the 2-meter one, but there is one less multiplier stage. A 6CL6 crystal oscillator-multiplier, with either 8- or 12-Mc. crystals, drives a 12AV7 parallel doubler to 50 Mc. The final stage is a 2E26, delivering an output of about 6 watts. (We measured better than 6 watts with a Micromatch into a matched load.) The modulator has a 12AX7 amplifier working into a 6V6GT. This also serves as the receiver audio system.

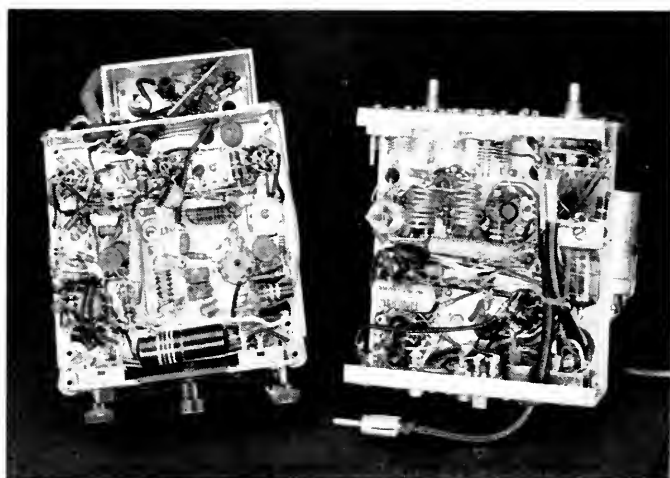
The receiver front end has a 6BQ7A cascode r.f. amplifier and a 12AT7 mixer-oscillator, with 11-Mc. output. The receiver oscillator is on the high side, so there is no problem with 28-Mc. images. Mixer output is 11 Mc., and there is one stage of i.f. amplification, a 6BH6, at this frequency. Then follows a 6BE6 converter to 1500 kc., and a 6BJ6 i.f. amplifier. The functions of detector, noise limiter, a.v.c. rectifier and first audio amplifier are combined in a 6TS, which feeds the audio system. A subminiature 6BG7 dual triode handles the squelch. Our noise generator shows that the noise figure of the 6-Meter Communicator is better than is required for good weak-signal reception.

The power supply is identical to the 2-meter unit, having two 6X4 rectifiers, and provision for either 6-volt d.c. or 115-volt a.c. input. Connections for these two types of operation are made by separate cables supplied with the unit.

A variation from the 2-Meter Communicator is seen in the antenna furnished. The 19-inch whip is replaced by a polyethylene-insulated half-wave Zepp that can be rolled up and carried in a pocket. The quarter-wave whip idea is less effective with the 6-meter rig, as there is insufficient metallic mass in the cabinet to serve as a ground-plane at this lower frequency. The manufacturer also offers 6-Meter yagi antennas that can be used individually or in stacked pairs.

Cabinet appearance, power supply and audio system are identical to the 2-Meter Communicator. The 6-meter model is supplied for either 6- or 12-volt operation. — E. P. T.

Bottom views of the receiver and transmitter used in the 6-Meter Communicator. Outboard unit on back of receiver is cascode r.f. amplifier. Receiver and transmitter use common audio system.



# Happenings of the Month

## BOARD MEETING

In May the Board of Directors of the American Radio Relay League will meet to examine the record for 1954, and to come to decisions charting a continuing course for the future. The director of your division is *your* voice in League affairs. Communicate to him your views on matters of the day so that he may be informed, as is required of him in the By-Laws, "as to conditions and activities in his territorial division and as to the needs and desires of the members therein in order that he may faithfully and intelligently represent the true interests of such members."

## TECHNICIANS GET 50 MC.

In mid-March FCC released its decision in Docket No. 11157, dealing with Technician Class privileges: the 50-54 Mc. band is opened to that class of license effective April 12th; FCC dismissed its proposal to open also the 144-Mc. band to Technicians. The text of the order follows:

1. As a result of its consideration of petitions for rule making filed by James M. Price and Tom A. Walker, the Commission adopted the Notice of Proposed Rule Making in this proceeding, and it was published in the Federal Register on September 11, 1954, 19 FR 5917. The Notice proposed amendment of Section 12.23(d) to permit operation by Technician Class amateur operators in all amateur frequency bands above 50 Mc. which would have the effect of adding the 50-54 Mc. and the 144-148 Mc. bands to the privileges presently available to the Technician Class licensee. The petitions of Messrs. Price and Walker proposed addition only of the 50-54 Mc. band to the existing privileges for the Technician Class operator.

2. Comment on the proposed amendment was submitted by some 18 amateur organizations and over 125 amateurs individually. In regard to the 50-Mc. band, there appears to be substantial expression of approval of provision for Technician Class operator privileges therein.

3. As evidenced by the comment received, there appears to be considerable controversy as to whether technicians

should be allowed to operate in the 144 Mc. band. Because of the opposition expressed by the American Radio Relay League, and because it does not find the arguments expressed in the comments otherwise decisive, the Commission is hereby dismissing that portion of the proposed amendment having to do with technician privileges in the 144 Mc. amateur frequency band.

4. This amendment is issued pursuant to authority contained in Sections 4(i) and 303(f), (g), and (r) of the Communications Act of 1934, as amended. IT IS ORDERED, That effective 3:00 a.m., EST, April 12, 1955, Section 12.23(d) of Part 12, Rules Governing Amateur Radio Service, IS AMENDED as set forth in the attached Appendix.

FEDERAL COMMUNICATIONS COMMISSION  
*Mary Jane Morris*  
Secretary

Adopted: March 9, 1955

Released: March 10, 1955

## APPENDIX

SECTION 12.23(d) OF PART 12, RULES GOVERNING AMATEUR RADIO SERVICE, IS AMENDED AS FOLLOWS:

(d) Technician Class. All authorized amateur privileges in the amateur frequency band 50-to-54 Mc. and in the amateur frequency bands above 220 Mc.

## QST ARTICLE AWARDS

The Executive Committee has announced its selection of three outstanding articles which appeared in *QST* during 1954, and awarded the authors cash prizes of \$300, \$200 and \$100. Single-sideband, as might be expected from its rapid development in 1954, was the subject for the No. 1 spot — the judges were unanimous in making the first award to Warren B. Bruene, W0TTK, for his November article, "Distortion in Single-Sideband Linear Amplifiers." A special, and hitherto untreated, phase of TVI ran a close second — the next award was to F. E. Ladd, W2IDZ, for his two-part article in June and July,

On March 19th, 200 VEs representing all of Canada met in Montreal to honor Canadian Director Alex Reid, VE2BE, who on December 31, 1954, became the first director to complete 25 years of continuous service on the ARRL Board of Directors. Amateurs from all parts of Canada joined to present Alex with a single-sideband exciter unit and accessory gear, as a token of appreciation. Here (*l. to r.*) are: ARRL General Manager Budlong, WIBUD; Mrs. Gordon Lynn; Director Reid; Mrs. Reid; ARRL President Dosland, W0TSN.



"50 Mc. TVI — Its Causes and Cures." Antennas, as last year, provided the third subject — the award going to William B. Wrigley, W4UCW, for his February article "Impedance Characteristics of Harmonic Antennas."

### CHAMBERS' 25TH

On March 6th, C. Vernon Chambers, *QST* Technical Assistant, became the seventh member of the present ARRL Hq. staff to reach the 25-year mark.

"Vern" came to Hq. as an office boy, but the inevitable happened — the bug bit, and he shortly became W1JEQ. His interest and development ability made him a logical candidate for



W1JEQ

lab work, and he turned out a number of pieces of gear for *QST*, with special attention to low-power equipment for the beginner. He was associated with Ross Hull in the development of u.h.f. gear for the *Handbook* and carried that work to completion after Hull's untimely death. Vern then took over the ARRL Technical Information Service until World War II interrupted with both Army and civilian service in the field of guided missiles.

Chambers' postwar projects for both *QST* and the *Handbook* have included a goodly number of items at beginner level, but have ranged into many other fields as well — mobile gear, development of high-power r.f. chokes, and all sorts of general transmitting designs. His bandswitching rig in January 1954 *QST* brought more response from amateurs than perhaps any other article postwar.

When we use on Vern the old saw, "The second 25 years are the hardest," it isn't really funny: he has that much longer to go before reaching retirement age!

### OPERATION IN GREENLAND

For some months negotiations have been in process for the authorization of amateur operation in Greenland by U. S. citizens. Permission has now been granted, under an agreement with the Danish government, and the U. S. military

is to issue detailed rules and regulations as well as issue call signs from the block KG1AA through KG1LZ.

### NOVICE TALKING BOOK

The Division for the Blind, Library of Congress, through the facilities of the American Foundation for the Blind, has produced a new Talking Book, "The Radio Amateur's Novice Examination, Questions and Answers." Excised from ARRL publications, and with code practice material especially written and taped by Hq., the package consists of eight 12-inch record sides. It is available to qualified blind readers through the 28 regional libraries in the usual manner (see list page 30, January 1953 *QST*). Thomas B. Hedges, W3QQS, assistant chief of the Division, contemplates expanding the Talking Book program to higher grades of amateur license if interest warrants.

### A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. All you have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4 1/4 by 9 1/2 inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner. (Bold-face type indicates change since last *QST* listing.)

- W1, K1 — J. R. Baker, jr., W1JOJ, Box 232, Ipswich, Mass.
- W2, K2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
- W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.
- W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
- W5, K5 — Oren B. Gambill, W5WI, 2514 N. Garrison, Tulsa 6, Okla.
- W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
- W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.
- W8, K8 — Walter E. Musgrave, W8NGW, 1294 E. 188th St., Cleveland 10, Ohio.
- W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wisc.
- W0, K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.
- VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
- VE2 — Harry J. Mabson, VE2APH, 122 Regent Ave., Beaconsfield West, Que.
- VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.
- VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
- VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
- VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.
- VE7 — H. R. Hough, VE7HR, 2316 Trent St., Victoria, B. C.
- VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.
- VO — Ernest Ash, VO1A, P. O. Box 8, St. John's, Newfoundland.
- KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.
- K1H6 — Andy H. Fuchikami, K1H6BA, 2543 Namaau Dr., Honolulu, T. H.
- KL7 — Box 73, Douglas, Alaska.
- KZ5 — Gilbert C. Foster, KZ5GF, Box 407, Balboa, C. Z.

# 21st ARRL Sweepstakes Results

## Part I—C.W.

BY PHIL SIMMONS, W1ZDP

SAYS W5VNW: "Thanks for 40 hours of solid enjoyment. As the operator of a fixed, low-power station, the Sweepstakes is my choice of all the contests." Says W1UTA: "I like the SS because it offers good practice in operating procedure, the thrill of raising new sections, an opportunity to learn how the rig really performs, but best of all, the chance to study the personality of a good cross-section of Hamdom. I have observed with a grin the leisurely fellow whose clock is five minutes slow, the hurry-hurry boy who doesn't wait for a 'roger,' and the operator who CQs 15 times before you find you've already worked him." Says W0BUR: "I like the absence of the cut-throat dog-eat-dog competition that marks some other contests." Says W4CVM: "Conditions were about as near perfect as I can remember them. There seemed to be more of the 'old ham spirit' this year, and all of the regulars were on hand: W3BES, W4HA, W9IOP, W1FTX, W4KFC, W4CIU and many others." Says W8APC: "Judging from the serial numbers



Jack Bryant, W5TFB, was stricken by SS-itis at an early age. Now 17, Jack already has stacked three consecutive North Texas wins, was tenth high nationally and top W5 in the '54 doings.



being sent the second week end, the entire population of the state of Connecticut will be needed to check the logs!"

The foregoing colorful contestimonials show why 1796 entrants (1394 c.w.) enjoyed themselves immensely (and why contest-checker W1CUT, ex-W5TQD, almost went back to Texas). They indicate, too, why the 1954 SS

moves into the record books as the biggest ever held, dwarfing previous highs registered in 1939 and 1953. Gripping about contest rules and poor conditions was all but nonexistent as scores rocketed to adding-machine proportions and 84 hard-working section and Novice winners earned certificates for brasspounding.

We're pleased to revive a popular prewar SS feature which listed, among other items, the equipment and bands of the section leaders. Aided by some fast slip-stick fumbling, one finds that there is real thought-food here; e.g.:

1) About 85 per cent of the 72 section winners utilized the trusted 20–40–80-meter band combination (although five of them scooped up extra credits on 15 meters).

2) Seventy-seven per cent fell in the 100-watts-or-less category, while the rest ran high power.

3) The *average* winner racked up 590 contacts in 66.6 sections for 97,450 points, was active 35 hours with 175 watts input.

4) Low-power champ was 25-watt Oklahoman W5WZV.

5) One-band champ was South Texan W5WQN with 704 QSOs on 7 Mc.

The set-ups in the tabulation typify the "new look" in SS circles, as compared with the May, 1940 *QST* version, which recorded such bottles as

◆  
Md.-Del.-D.C. leader W3JTK settled for 180,540 points, ranked fifth amongst the 1394 c.w. entrants with a 100 per cent home-brew rig. The gadget at the upper right, a photoelectric-keyed CQ SS wheel, gave a good account of itself, Jack reports.



**QST for**

860s, T-40s, HK-254s and 211s in vogue in those days. (And you just can't hardly get them no more!) Rifle through your old-time *QST*s and see for yourself what the previous generation of SS enthusiasts worked with.

Now here's a foursome that knows the business

by heart! Each sends code reminiscent of a W1AW Qualifying Run and sports a clean, ether-wrenching signal. Each salted away over 1100 contacts and attained, for the first time in SS annals, a final score in excess of 200,000 points. Congratulations are in order, then, to W4KVX

## C.W. WINNERS, 21st A.R.R.L. SWEEPSTAKES CONTEST

Section	Call	Score	Transmitter	Watts Input	Receiver	Bands Used
E. Penna.	W3GHH	147,502	6BA6-6AQ5-2E26-813	95	HQ129X	80, 40, 20
Md.-Del.-D. C.	W3JTK	180,540	VFO-807-813s	100	Super Pro (modified)	80, 40, 20
S. N. J.	W2GND	85,313	32V3	100	HR060	80, 40, 20
W. N. Y.	W2SSC	133,175	Sig. Shifter-809	99	75A3	80, 40, 20
W. Penna.	W3LMM	104,512	BC610E	700	NC240D	80, 40, 20
Illinois	W9ERU	157,230	32V1	100	75A1, SX43	80, 40, 20
Indiana	W9IOP	208,506	VFO-6AQ5-4-65A	100	75A3, DB23	80, 40, 20
Wisconsin	W9RQM	143,080	VFO-813	90	HR050T	80, 40, 20
No. Dakota	W0ARB	103,599	6AG7s-2E26-814	100	SX71	80, 40, 20
So. Dakota	W0SMV	19,936	6AG7s-2E26-813	350	HQ129X	80, 20
Minnesota	W0YCR	139,650	VFO-807s	95	Super Pro	80, 40, 20
Arkansas	W5MSH	92,400	6V6-6L6-812A	100	NC240D	80, 40, 20
Louisiana	W5KC	141,468	32V3	100	HRO 7	80, 40, 20
Mississippi	W9APY/5	72,371	6AG7s-6AQ5-807-4-250A	100	BC348, BC453, SOJ	80, 40, 20
Tennessee	W4TJI	91,803	Sig. Shifter-1625s-814s	450-140	S76, DB22A	80, 40, 20
Kentucky	W4KVX	209,353	Sig. Shifter-813	80-100	Super Pro (BC453 2nd i.f.)	80, 40, 20
Michigan	W8DUS	113,971	32V2	100	75A3, DB23	80, 40, 20
Ohio	W8LQA	146,213	VFO-807-35T	100	HQ129X	80, 40, 20
E. N. Y.	W2IFP	80,010	6AG7s-807-813s	95	BC312, Q5er, RME10-20	80, 40, 20
N. Y. C.-L. I.	W2IVS	117,775	12AU7-5AU6-5763s-6146	95	NC240D	80, 40, 20
N. N. J.	W2TPJ	80,404	PTO-6AQ5s-807s	100	BC224	80, 40, 20
Iowa	W0NWX	131,850	Lysco 600-HT20	99	SX88	80, 40, 20
Kansas	W0BCI	109,784	32V3	95	SX28	80, 40, 20
Missouri	W0LLU	64,103	6AU6-6AG7-807	30	SX71	80, 40, 20, 15
Nebraska	W0URB	109,395	VFO-Viking II	95	SX71, FL8A	80, 40, 20
Connecticut	W1BIH	101,250	VFO-Bandbox-6146	80	HQ129X, Q5er, FL8A	80, 40, 20
Maine	W1IKE	81,453	VFO-Bandbox-6146	90	75A3	80, 40, 20
E. Mass.	W1IAP	106,225	310B (exciter-amp.)	100	75A2	80, 40, 20
W. Mass.	W1JYH	119,340	310B-4-125A	100	HR05	80, 40, 20
N. H.	W1ARR/1	102,935	32V2	95	75A2	80, 40, 20
R. I.	W1CJH	64,431	VFO-813	90	75A1	80, 40, 20
Vermont	W1RWP	58,476	BC457A-6L6s-814s	150-250	BC342J, Q5er	80, 40, 20
Alaska	KL7EVR	43,370	6SJ7-6AC7-6AG7-1E27	95	BC348Q	40, 20
Idaho	W7TYG	14,006	VFO-6AG7-1625s	100	Homebuilt super	80, 40
Montana	W7KVU	202,210	5100	100	75A3, DB23	80, 40, 20, 15
Oregon	W7GEB	116,253	310B-813	100	75A2	80, 40, 20
Washington	W7NLI	126,114	VFO-1E27	100	NC200	80, 40, 20
Hawaii	KH6IJ	32,670	4-250As p.a.	1000	HQ129X	40, 20
Nevada	W7KEV	168,448	VFO-807-4-65A	100	HQ129X	40, 20
Santa Clara V.	W6HOC	127,294	6AK6s-6AG7-6AQ5s-1D32	95	Super Pro	80, 40, 20
East Bay	W6TT	78,768	4-250As p.a.	600	75A3	80, 40, 20
San Francisco	W6BIP	72,781	6K7-6SK7-6L6-6AG7s-6L6-813-VT127As	500	SX28, Q5er	80, 40, 20, 15
Sacramento V.	W6MYT	27,775	ARC5-807-1-125As; ARC5-807-T40s	125; 650	SX28A	80, 40, 20
San Joaquin V.	W6MPG	47,439	Sig. Shifter-1625s-304TL	750	SX25	40, 20
No. Carolina	W4VHH	69,370	6V6-6L6-809	100	HQ129X	80, 40, 20
So. Carolina	W4TL	68,741	HT18-6146s	100	HR05	80, 40, 20
Virginia	W4KFC	203,850	VFO-807-257B	100	75A2	80, 40, 20
W. Virginia	W8PQQ	52,488	VFO-304TLs	700	75A2	80, 40, 20
Colorado	W0EWH	79,275	6AG7s-6L6-2E22-826s	100	SX71	80, 40, 20
Utah	W7QDM	85,844	6AG7s-807s	90-95	BC348	80, 40, 20
Wyoming	W7HRM	69,438	VFO-807-813	300	NC200, DB20	80, 40, 20
Alabama	W4RAL	64,654	VFO-12A6-128L7-12A6-1625s	95	SX28	80, 40, 20
E. Florida	W4LVV	101,756	310B-813	95	HRO	80, 40, 20
W. Florida	W4WKO	109,743	VFO-813	95	HR07A	80, 40, 20
Georgia	W4FCB	62,712	Viking II	150	HQ129X	80, 40, 20, 15
West Indies	KP4AAC	31,625	813s p.a.	90	HR050, BC453, Q5er	40, 20
Canal Zone	KZ5NB	4900	6AG7-6V6-807s	35	Homebuilt 8-tube super	20
Los Angeles	K6CEF	130,123	5814-6AU6-5763s-6146	100	75A3	80, 40, 20
Arizona	W4KMF/7	82,800	BC459-6L6s-814	100	HQ129X, Pana-laptor	40, 20
San Diego	W6EPZ	142,076	4-250As p.a.	100	75A1	40, 20
Santa Barbara	W6ULS	119,653	32V2	95	75A1, preamp.	80, 40, 20, 15
No. Texas	W5TFB	152,479	HT18-HT20	100	S76, Hetrofl	80, 40, 20
Oklahoma	W5WZV	41,120	TBS50	25	SX28	80, 40, 20
S. Texas	W5QNZ	121,440	6AK5s-5763-2E26-4-65As	100	SX25, BC348, Q5er	40
New Mexico	W5QNZ	126,936	VFO-829-304TL	1000	HR060 (plus i.f. strip)	80, 40, 20
Maritime	VE1AR	103,850	VFO-6AG7-814-810s	90	HQ129, Q5er, SOJ	80, 40, 20
Quebec	VE2BX	56,560	5763-6C4-6AG7-2E26-807W	75	SX25	80, 40, 20
Ontario	VE3AUU	62,235	6C4-6AQ5-807s; 6C4-6AG7-2E26-813	95	HQ129X	80, 40, 20
Manitoba	VE4MX	45,900	6AG7-6L6-2E26-812A	100	HQ140X	80, 40, 20
Saskatchewan	VE5CW	44,756	VFO-Viking II	115	HQ129X, DB22A	80, 40, 20
Alberta	VE6ZR	42,776	BC221-6AC7s-807	70	SX28	80, 40, 20
B. C.	VE7ZK	62,245	6C4-6AQ5s-6146	75	NC240D	80, 40, 20



for his all-time record-smashing 209,353-point tally, and to W9IOP, W4KFC and W7KVU for their totals of 208,506, 203,850 and 202,210, respectively.

And for their savvy and downright stick-to-it-iveness, plaudits and salaams to these others who broke 125,000: W3JTK 180,540, W7KEV 168,448, W3EIS 165,638, W9ERU 157,230, W9YFV 154,030, W5TFB 152,479, W3GHM 147,502, W8LQA 146,213, W3FRY<sup>1</sup> 145,726, W8BTI 144,540, W9RQM 143,080, W6EPZ 142,076, W5KC 141,468, W3AEL 140,875, W0YCR 139,650, W3JBC 134,502, K6BLI<sup>1</sup> 133,590, W2SSC 133,175, W0TKX 133,043, W3CTJ 132,313, W0NWX 131,850, W9NPC 131,823, W3BES 130,488, W3GRF 130,315, K6CEF 130,123, W4PNK 129,634, W9PNE 129,330, W3JTC 128,845, W6HOC 127,294, W5QNZ 126,936, W7NLI 126,114, W8EV 125,925.

Section-hunting remains the favorite pastime of a goodly share of the gang, and it's quite an art. Here is the sharp-eared crew that bagged all 73 ARRL sections in '54: W1s EOB JTD ZDP, W2FEB, K2BZT, W3s ADZ ALB BES CTJ FRY JBC JNQ JTC KT, W4s KVN YFA, W5TFB, W6s BIP EPZ HOC MUR PYH ULS UTV YK, K6s BLL CEF, W7s GEB KEV KVV PQE, W8s DUS EV, W9s IOP RQM YFV, W0TKX. Note that all U. S. licensing areas made the grade. Saskatchewan, Yukon/N.W.T. and Idaho would seem to be the toughest; 17 of the 37 experts named one of the three as the last section snagged. But K2BZT, who made the "clean sweep" in just 257 contacts, and ex-W1AW op WIJTD, who did it in 310, are the two who worked the *mostest* with the *leastest*. Choosy W0QDF likewise merits honorable mention for getting 72 out of a mere 74 QSOs.

Heartening indeed are the many friendly new faces that crop up yearly in the special Novice competition which the Sweepstakes affords. When three or more KN/WN people enter logs from a given section, the leader nabs an appropriately-endorsed Novice certificate. The following yearlings earn a burst of applause, and the certificate as well, for graduating *magna cum laude* from their first venture into contest capers: W1s BLD CDD, KN2HXR, WN3ZKH, WN5HIS, KN6EVR, W1s SRK TGB, W1s GBC HAH IGV, WN0SQE. See you in the '55 SS *minus* the "N," fellows!

<sup>1</sup> Multioperator station.

## Sidelights

Lavish antenna systems were brought into play by the 200-grand quartet. W4KVX relied on 280- and 405-foot zepps, a 7-Mc. ground plane, and a 14-Mc. beam; all four were suspended from or mounted on telephone poles. W9IOP found an end-fed 136-foot wire, a 40-meter ground plane, and a 20-meter rotary to his liking; and so did W4KFC, who utilized an identical bunch of skyhooks. Out west, W7KVU made that huge signal even huger with such paraphernalia as (1) for 80 meters, a wire 12 wavelengths long and a half-wave zepp; (2) a 7-Mc. ground plane and zepp; (3) 3-element wide-spaced rotaries for 15 and 20. . . . Lament from multips W3s WIE WIF at close of festivities: "Brother, are we tired." (Boys, you weren't alone!) . . . W8CUP says his FL8A filter saved the day. . . . W2BRC got 43,935 and W2CJM 13,069 points with attic antennas. . . . W2MUM pounded bases for the Order of BO (Boiled Owls). . . . Overheard on 20 the last Sunday: WIJYH



Budding contester Dick Brandt, KN2HXR, E. N. Y. Novice winner, got the most markers registered by a KN/WN in SS competition — over 10,000. For further news of Dick's operating sojourns, see the Novice Round-up results on page 50.

explaining the rules to W1KGH/VE8. After Rog had paved the way, the mob descended. . . . K2ENO broke in a new SX-24 and got 7 additional states. . . . Anchor man for Ohio Valley Amateur Radio Association was 2-watt W8BAE. . . . Those who swapped messages with Iowan W0NWX unwittingly nailed F08AJ/W0. Bob was using the transmitter-inhaler combo of the famous Clipperton DXpedition (July, 1954, QST). . . . W0FVD is positive his code speed improved as a result of struggling with weak sigs in the QRM. . . . In '53 WN1YMA made 34 QSOs, in '54 W1YMA got 741! How's that for improvement! . . . W4LVV found conditions good except for one weird 90-minute spell on 20 meters when it was impossible to raise anyone although incoming signals were strong. . . . W6OAY is confident QSLs will come through from several new states worked. . . . W3BQU/5 landed 23,490 points with a 24-watt transformerless rig. A voltage doubler juiced the p.p. 117L7s in the crystal oscillator circuit. Dimensions: a pocket-sized 4-by-4 inches. . . . KV4BK, ex-7CO (1912), 6RX (1920), and W5RX (1947), enjoyed the "other side of the fence" despite fierce QRM. QRT for 20 years, Charles

## NOVICE C.W. WINNERS, 21st A.R.R.L. SWEEPSTAKES CONTEST

Section	Call	Score	Transmitter	Watts Input	Receiver	Bands Used
Mid.-Del.-D. C.	WN3ZKH	5003	Viking II	75	HR05	80, 40, 15
Illinois	WN9GBC	3250	807s p.a.	70	SX42	80
Indiana	WN9IGV	6695	6AG7-6L6-807	60	NC125	80
Wisconsin	WN9HAH	2640	AT1	35	S76	40
Michigan	WN8SRK	468	AT1	15	SX71	80
Ohio	WN8TGB	3313	AT1	30	NC98	80, 40
E. N. Y.	KN2HXR	10,036	AT1	35	S40B	80
Iowa	WN0SQE	3413	Ranger	65	S7C	80, 40
Connecticut	WN1CDD	3503	Globe Scout	50	S40B	80, 40, 15
E. Mass.	WN1BLD	5740	TB850	50	HQ129X	80
Los Angeles	KN6EVR	8229	Viking II	75	NC173	80, 40
No. Texas	WN5HIS	2719	Lysco 600	50	SX28A	80, 40, 15

returned to top c.w. form rapidly in the SS. . . . Alaskan pace-setter KL7EVR apologizes for his difficult-to-read log transcribed at 16,000 feet during a KL7-to-W7 flight. . . . A 2-tube regen job performed the receiving chores for W6FAR. . . . W4KFC's 1183 stations worked in '53 is still tops. . . . With the same 30-watter he had last year as a Novice, W9YOS was tickled to multiply his score by 3. . . . W4KVX employed a card logging system complete with automatic time stamp and numbering machine to assist in avoiding or nullifying repeat QSOs as they occurred. . . . W8OTK thanks the boys for QRsing for him his first time out. . . . W7PQE got ten KL7s but had to cajole VE5 and K116 non-SSers into swapping preambles. . . . Complete break-in system (March, 1954, QST) — using tubes for antenna-switching and receiver-quieting — worked great at W7GEB. . . . We can thank WIRWP for increased Vermont activity. Stan has been carrying on a feverish one-man campaign to get better representation from that elusive section. . . . W4KMF/7 avows the competition in Arizona is considerably less rugged than it was in Virginia. . . . W5WZV captured his first SS scalp since 'way back in '36 and '37 when he earned Philippine honors as KAIUS. . . . W1WAI snared his 48th state, learned much about when to work which bands. . . . W1IAP used a receiver-controlled VFO on 7 Mc. . . . W9RQM's XYL presented him with a new junior op during the SS. . . . The last 25-cycle power areas were being converted to 60 cycles near VE3ACB and intermittent power leaks held down his score. . . . W4KFC tells a little tale about a newly-recruited Potomac Valley member, W1NQML Sparkie was calling a Vermont when his key actually fell apart, whereupon he scooped up a screwdriver, finished the call with the blade, and landed the Vermont station! . . . "My first SS in 19 years. The last time I entered, as W2BMX, I won for E.N.Y. with two crystals, 152 contacts. Needless to say, I was feeling my way in this one. Just wait 'til next year!" — W4CXA. . . . "What a wonderful time! The SS seems to get better every year. Conditions were the best that I can remember, and operating proficiency and signal quality were better than ever before. Chirps, yoops and clicks were at a low ebb, making operating a distinct pleasure. . . . Some sort of award should be given to the XYLs who are the backbone of a good score. Where would we be without the hot coffee, special meals at off-hours, and plentiful supply of sharp pencils and log sheets. Yes, they deserve a big hand for their help!" — W7KTV. . . . "Surprised to end up with the same number of contacts (199) in 21st as in 20th SS. Also was lucky enough to have Vermont and VE8 reply to my CQ machine." — W6BIP. . . . "Wonderful contest! Found 21 Mc. wide open but nobody there; 14 Mc. best band out here." — W7GEB. . . . "The 20-watt transmitter that gets RST 599 1000 miles away on 3.5-Mc. SS eve, when the customary handful of stations are tuning up for the event, is fairly ineffective in the melee starting at 1800 EST the next day, but 75 to 100 watts does the job FB. You can get the contacts with lower power but you have to work hard and be discouragingly patient. Every year, though, I'm back with more determination than ever." — W8DM. . . . "First contest and it was a barrel of fun." — W8IRO. . . . "My object each year has been to work all sections. Thought I had it this time when a VE8 answered but discovered too late that I had missed Sacramento Valley. Oh well, maybe next year!" — W8ZJM. . . . "Wow, what a battle! Heard the W6s working W1QMM (Vt.) on 20 but couldn't find him. My family is beginning to speak to me again!" — W3LMM. . . . "Gained valuable operating experience and learned how to tune up the rig in a hurry." — W0TLD. . . . "Conditions excellent the first session and almost as good the second. Sections I usually have trouble logging were in abundance, but there seemed to be a dearth of KZ5, VE5 and VE8 participants. This was my twelfth SS." — W0YCR. . . . "Bettered

previous scores made as W3UVB and W8YJE and finally went over 100,000 points. No repeat contacts thanks to my first use of ARRL Operating Aid No. 6." — W4CYV. . . . "My second SS and pleased to better last year's score considerably. A foolproof break-in system is a must!" — VE2CB.

Next month — be the good Lord willing! — we'll bring you a symposium of club and 'phone highlights, including an A3 equipment tabulation and such photographs as we can muster. Di-dah-di-di-di!

## C. W. SCORES

### Twenty-First Sweepstakes Contest

Scores are grouped by Divisions and Sections. . . . The operator of the station first-listed in each Section is award winner for that Section unless otherwise indicated. . . . Likewise the "power factor" used in computing points in each score is indicated by the letter A or B. . . . A indicates power up to and including 100 watts (multiplier of 1.25, c.w.), B over 100 watts (multiplier of D). . . . The total operating time to the nearest hour, when given for each station, is the last figure following the score. . . . Example of listings: W3G1HM 147,502-831-71-A-39, or, final score 117,502, number of stations 831, number of sections 71, power factor of 1.25, total operating time 39 hours. . . . An asterisk denotes Novice certificate winners in sections where at least 3 Novice logs were submitted. . . . Multioperator stations are grouped in order of score following single-operator station listings in each section tabulation, with calls of participants in parentheses.

#### ATLANTIC DIVISION

##### Eastern Pennsylvania

ATLANTIC DIVISION							
Eastern Pennsylvania							
W3G1HM	147,502-	831-71-A-39	W3MJJB	20,800-	208-40-A-27		
W3JRC	134,502-	737-73-A-38	W3TJW	18,602-	217-43-B-27		
W3C'TJ	132,313-	725-73-A-35	W3I'OE	17,588-	201-35-A-11		
W3RHS	130,188-	719-73-A-39	W3V'NQ	17,588-	202-35-A-26		
W3C'PS	116,200-	661-70-A-40	W3D'FJ	17,438-	155-45-A-21		
W3EQA	112,590-	626-72-A-39	W3D'YL	15,502-	169-46-B-14		
W3JNQ	111,325-	610-73-A-38	W3YVJ	15,050-	210-29-A-21		
W3DLR	103,680-	576-72-A-36	W3K'FQ	14,880-	135-48-B-10		
W3ALB	99,280-	511-75-A-30	W3ZJC	12,480-	156-32-A-24		
W31'NX	82,283-	177-69-A-27	W3OCU	12,000-	120-40-A-6		
W3ADZ	81,030-	141-73-A-30	W3HTR	11,750-	100-47-A-24		
W3H1LK	75,098-	185-62-A-40	W3GSD	11,550-	140-33-A-4		
W3KT	75,008-	411-73-A-30	W3WHJ	10,153-	133-31-A-21		
W3BIP	71,120-	436-68-A-38	W3Q1L	9975-	133-30-A-11		
W3C'PY	69,300-	396-70-A-30	W3YDV	8080-	101-40-B-8		
W3KDP	66,185-	427-62-A-26	W3DWR	6900-	120-23-A-10		
W3MWV	64,508-	423-61-A-39	W3TDF	5606-	100-23-A-14		
W3LEZ	63,860-	412-62-A-17	W3C'LC	5394-	98-29-B-6		
W3NOH	62,865-	381-66-A-14	W3UUA	5280-	88-24-A-3		
W3E'W	56,871-	267-71-A-25	W3F'NX	4518-	70-20-A-6		
W3ISE	55,500-	370-60-A-31	W3ZTF	4420-	72-26-A-5		
W3C'ID	54,431-	325-67-A-30	W3OY	3750-	60-25-A-8		
W3ARK	51,116-	382-68-B-33	W3GAG	3575-	65-22-A-7		
W3RAF	51,693-	357-58-A-32	W3TMN	3341-	52-27-A-15		
W3MDE	47,925-	270-71-A-32	W3U'NX	3150-	70-18-A-11		
W3M'WL	45,360-	320-72-B-28	W3YLL	3140-	56-21-A-6		
W3TYW	43,734-	307-59-A-40	W3JLB	2900-	62-21-A-18		
W3MDO	42,075-	281-60-A-34	W3W'YU	2678-	61-18-A-15		
W3TPC	33,810-	322-42-A-34	W3ANZ	2600-	50-26-B-15		
W3QHD	32,873-	245-54-A-37	W3HOG	2250-	60-15-A-17		
W3C'H1	32,688-	262-50-A-16	W3YLL	1381-	33-17-A-14		
W3RRI	32,336-	378-45-B-40	W3W'YU	245-	14-7-A-3		
W3ADE	31,175-	215-58-A-18	W3PNL	175-	10-7-A-1		
W3SOH	30,070-	194-62-A-24	W3ZPT	15-	3-2-A-1		
W3C'GS	28,875-	210-55-A-19	W3VXP	10-	4-1-A-3		
W3FEN	27,945-	233-46-A-24	W3FRY	(W3s BE LYF)	145,726-	801-73-A-33	
W3KFK	27,840-	233-48-A-32	W3OVV	(W3s KT OVV)	54,060-	318-68-A-18	
W3SQX	24,558-	209-47-A-13	W3KIJ	(W3s KH YEK,	W3GVV)	23,449-	242-39-A-35
			W3ZCV	(W3s ZCV)	W3EAN	(W3-EAN ZBN)	
					22,000-	250-44-B-11	

With this spiffy layout, John Ryan, W7KVU, brought home a blistering 202,210 points and the Montana wallpaper. When he feels like creating additional db. for DX chasing, John uses the B & W 5100 to excite p.p. 4-400As at one kw.

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W3JTK. 180.540-1003-72-A-39  
 W3E18. 165.638-947-70-A-40  
 W3AEL. 140.875-805-70-A-40  
 W3GRF. 130.315-780-67-A-40  
 W3JTC. 128.845-706-73-A-40  
 W3PQB. 119.801-696-68-A-40  
 W3KDP. 112.338-644-70-A-40  
 W3IKN. 111.325-730-61-A-40  
 W3DVO. 111.176-645-69-A-40  
 W3E1E. 104.363-606-69-A-40  
 W3CQO. 93.680-589-64-A-38  
 W3M1C. 89.780-538-67-A-39  
 W3DRD. 86.620-488-71-A-32  
 W3M1F. 81.520-511-64-A-37  
 W3U1E. 77.350-442-70-A-39  
 W31YE. 70.850-436-65-A-32  
 W3KLA. 70.805-497-57-A-40  
 W3VOS. 67.780-445-61-A-36  
 W3HVM. 64.725-435-60-A-39  
 W3WV. 60.860-449-68-B-26  
 W3TNZ. 60.605-392-62-A-27  
 W3QOQ. 45.430-415-44-A-33  
 W3C1Q. 45.203-387-65-A-33  
 W3MPR. 32.535-333-65-A-33  
 W3HTK. 36.988-270-55-A-25  
 W3VAN. 33.104-187-71-A-14  
 W3FDJ. 27.613-236-47-A-22  
 W3HDV. 27.349-218-51-A-28  
 W3V1V. 26.831-203-53-A-22  
 W3C1Z. 22.126-162-56-A-17  
 W3JZY. 22.244-166-67-B-23  
 W3VJV. 19.570-207-38-A-33  
 W3NHA. 19.129-207-47-B-20  
 W3H1N. 14.513-215-27-A-29  
 W3HRV. 12.226-157-39-A-17  
 W3V1E. 11.780-121-35-B-14  
 W3YAG. 11.701-127-37-A-26  
 W3UZS. 11.610-109-43-A-23  
 W3MSK. 11.500-100-46-A-19  
 W3WU. 9.910-106-34-A-16  
 W3VEB. 8.500-101-34-A-11  
 W3B1X. 8.100-11-30-A-13  
 W3RYX. 7.880-100-40-B-11  
 W3WAF. 7.183-115-26-A-18  
 W3VBO. 6.540-112-24-A-24  
 W3RRT. 6.126-86-29-A-19  
 W3WBI. 6.040-64-10-A-15  
 W3N3KH. 5.903-75-29-A-31  
 W3ROJ. 4.290-74-24-A-5  
 W3WBJ. 4.205-60-29-A-18  
 W3N3YA. 2.138-48-18-A-35  
 W3N3AQ. 6.65-21-14-A-22  
 W3CQD. 3.60-10-7-A-3  
 W3UTK. 3.5-10-7-A-3  
 W3FQE. 1.35-9-6-A-6  
 W3N3GP. 23-4-3-A-3  
 W3N3VVR. 5-2-1-A-1  
 W3CQF (W1RJN, W2HEI, K2BRY, W38 RJN, W38 RJN)  
 W3SE. 11.780-401-58-A-38  
 W3TCO (W3TCO, W3KEZ)  
 W3TCO. 447.353-537-A-37  
 W3TNN (W3TNN, W3TNN)  
 W3TNN. 41.160-294-56-A-37  
 W3W1E (W3W1E, W3W1E)  
 W3W1E. 26.686-293-37-A-40

## Southern New Jersey

W2GND. 85.313-528-65-A-40  
 K2ERC. 80.798-513-63-A-39  
 W2ZQK. 76.130-511-60-A-40  
 K2CFR. 74.120-511-60-A-40  
 W2CAG. 72.106-538-69-B-34  
 W2OXA. 56.160-352-64-A-26  
 W2HDW. 52.138-489-43-A-39  
 W2PAA. 52.096-407-64-B-23  
 W2DAJ. 43.036-371-58-B-23  
 W2ZWV. 42.430-368-14-A-14  
 W2LYL. 37.965-239-47-A-13  
 W2SDB. 26.780-206-52-A-22  
 W2YPA. 20.008-151-53-A-4  
 W2PNA. 16.720-176-38-A-4  
 W2QDY. 16.050-214-30-A-27  
 W2QKJ. 14.070-184-12-A-4  
 W2UAP. 14.000-140-40-A-15  
 W2W1W. 12.240-136-36-A-26  
 W2HAZ. 6.660-76-34-A-7  
 K2EWR. 5.130-108-19-A-18  
 W2EBW. 4.125-63-33-B-11  
 W2DMU. 4.030-63-33-B-11  
 W2LTI. 2.380-56-17-A-9  
 W2VMX. 1.040-33-16-B-5  
 K2WAO. 260-13-10-B-5  
 W2HBE. 119-10-5-A-2  
 K2BHQ (W2BHQ, K2BHQ)  
 W2BHQ. 87.650-412-62-A-40  
 KN2IJC (KN28 IJC, KN28 IJC)  
 KN2IJC. 810-29-12-A-36

## Western New York

W2SSC. 133.175-761-70-A-39  
 W2FEB. 69.204-476-73-B-40  
 W2NZA. 52.390-403-52-A-34  
 W2FJA. 52.054-332-63-A-31  
 W2VJO. 42.679-300-57-A-34  
 K2CAL. 42.126-284-40-A-40  
 W2ENW. 30.100-215-56-A-25  
 W2KEC. 23.460-231-51-B-19  
 K2EVP. 21.275-185-46-A-19  
 K2CUE. 21.080-273-31-A-18  
 W2Y1W. 20.395-199-41-A-18  
 W2F1U. 19.763-337-34-A-36  
 W2WOE. 18.275-170-43-A-12  
 W2EJM. 13.090-154-34-A-32  
 K2G1J. 12.813-127-41-A-16

W2QBB. 8586-80-54-B-22  
 W2OVP. 6683-100-27-A-14  
 K2BDI. 6355-82-31-A-9  
 W2KRW. 4928-73-27-A-4  
 K2GWN. 4181-80-22-A-15  
 W2CTA. 3100-50-31-B-6  
 K2GVN. 2600-50-26-B-11  
 W2MTA. 2580-44-24-A-29  
 W2KEL. 2496-52-24-B-7  
 W2RBY. 1845-42-18-A-3  
 W2ZRC. 1680-42-20-B-4  
 KN2GKK. 1509-41-17-A-38  
 W2DRN. 1120-29-16-A-8  
 K2HRE. 938-25-15-A-15  
 K2DGG. 578-21-11-A-4  
 W2PFI. 158-9-7-A-2  
 W2DKS. 152-10-8-B-1

## Western Pennsylvania

W3LMM. 104.512-736-71-B-40  
 W3PWN. 103.155-598-69-A-36  
 W3V1V. 82.209-625-67-B-38  
 W3NRE. 73.220-523-56-A-39  
 W3NKM. 30.003-241-50-A-29  
 W3CER. 25.180-260-49-B-11  
 W3WTC. 24.765-200-52-A-28  
 W3KQD. 23.010-177-52-A-10  
 W3UGV. 15.157-129-47-A-17  
 W3NUG. 13.760-172-40-B-17  
 W3ZVR. 13.660-163-32-A-32  
 W3JH1. 10.563-163-26-A-4  
 W3IDO. 10.200-102-40-A-23  
 W3VEJ. 10.000-100-40-A-24  
 W3N3DA. 7.608-97-34-A-27  
 W3CKS. 5.555-102-28-A-9  
 W3AKG. 4.55-14-13-A-3  
 W31OV. 2.1-9-B-4  
 W3VKD. 1.18-3-3-B-1

## CENTRAL DIVISION

## Illinois

W9ERU. 157.230-875-72-A-40  
 W9YFV. 154.030-844-73-A-40  
 W9NPG. 131.823-787-67-B-38  
 W9PNE. 129.330-720-72-A-40  
 W9AM. 104.649-647-21-A-39  
 W9B1H. 113.580-631-72-A-39  
 W9WFS. 106.650-598-72-A-28  
 W9KLD. 106.380-597-72-A-38  
 W9WJV. 105.471-618-69-A-39  
 W9TKR. 101.228-620-66-A-38  
 W9W1L. 101.450-502-72-A-39  
 W9MEM. 80.550-627-66-B-34  
 W9QCG. 67.875-462-60-A-40  
 W9LUO. 58.184-409-59-A-32  
 W9WHF. 54.366-357-61-A-37  
 W9WQE. 42.750-302-37-A-37  
 W9W1V. 34.694-229-61-A-17  
 W9MRQ. 32.508-301-54-B-22  
 W9O1J. 32.190-222-58-A-17  
 W9YLS. 30.750-246-50-A-17  
 W9AGM. 30.740-212-58-A-17  
 W9EET. 30.375-226-54-A-26  
 W9TPV. 29.412-259-67-A-15  
 W9KMN. 29.290-202-58-A-19  
 W9CLH. 29.250-266-45-A-36  
 W9ZJS. 28.710-250-58-B-32  
 W9OIN. 27.088-197-55-A-32  
 W9WYB. 26.500-200-53-A-17  
 W9W1L. 25.633-239-43-A-20  
 W9TZC. 25.033-180-47-A-20  
 W9BSC. 20.627-183-47-A-35  
 W9ZSQ. 20.445-176-47-A-31  
 W9HRQ. 15.980-136-47-A-27  
 W9HEC. 15.413-137-45-A-24  
 W9W1G. 15.150-168-37-A-20  
 W9YBV. 5.265-143-43-B-12  
 W9N1L. 15.180-165-46-A-19  
 W9ZOU. 13.443-145-38-A-23  
 W9QXN. 12.793-121-43-A-14  
 W9YDQ. 11.594-133-35-A-18  
 W9WPE. 11.298-135-42-B-21  
 W9DDR. 11.264-176-32-B-37  
 W9YOV. 11.025-105-42-A-21  
 W9YYG. 10.280-131-32-A-17  
 W9ZQC. 9.945-117-34-A-4  
 W9YRS. 9.563-132-30-A-25  
 W9LET. 9.090-102-36-A-17  
 W9CKC. 8.000-100-32-A-14  
 W9NCF. 5.500-100-22-A-38  
 W9H1W. 5.270-69-31-A-14  
 W9YSV. 5.193-72-31-A-23  
 W9HOO. 4.945-88-25-A-11  
 W9H1H. 4.492-74-31-B-13  
 W9H1B. 4.256-76-28-B-8  
 W9TRC. 3.728-65-23-A-8  
 W9TDO. 3.328-61-22-A-9  
 W9NGB. 3.250-50-26-A-21  
 W9REV. 3.150-50-26-A-4  
 W9ZMJ. 3.025-25-22-A-15  
 W9ZQC. 2.790-38-31-A-4  
 W9N1R. 2.778-58-22-A-39  
 W9H1S. 2.695-43-28-A-11  
 W9A. 2.574-40-26-B-7  
 W9DRN. 2.563-41-25-A-9  
 W9NFB. 2.540-41-25-A-9  
 W9EDH. 1.936-45-22-B-5  
 W9FDY. 1.575-35-18-A-10  
 W9FTV. 7.15-22-13-A-6  
 W9G1G. 6.33-23-11-A-6  
 W9H1H. 3.16-15-11-A-6  
 W9H1H. 2.86-15-11-A-6  
 W9A1O. 2.15-7-A-5  
 W9JAT. 2.36-7-A-5  
 W9QCP. 2.00-10-8-A-3  
 W9H1A. 1.80-10-8-A-5



John Driscoll, W2SSC, heard 761 stations reply during a 39-hour operating stint, consequently latched onto the Western New York certificate with no strain. He was W2 leader, too.

W9TJT. 165-11-6-A-6  
 W9N1KJ. 158-11-6-A-4  
 W9N9GQ. 8-4-1-A-3  
 W9TJT. 114.660-642-72-A-40  
 W9OCB (W9S DMO OCB)  
 104.975-620-68-A-40  
 W9OKI/9 (W9S LMP OKI)  
 33.198-271-49-A-22  
 W9AQJ (W9S AQJ OKQ)  
 30.250-220-55-A-20  
 W9VYD (W9S VYD WDR)  
 5375-86-25-A-24

## Indiana

W9IOP. 208.506-1151-73-A-39  
 W9PEY. 113.275-702-65-A-34  
 W9UMU. 92.400-567-66-A-40  
 W9YXX. 70.060-452-62-A-40  
 W9UKG. 68.340-411-67-A-40  
 W9N1H. 54.000-375-72-B-35  
 W9S1R. 52.920-420-63-B-36  
 W9DGA. 52.615-310-68-A-16  
 W9ZMN. 12.054-141-12-B-27  
 W9NCG. 49.280-308-64-A-28  
 W9AZM. 43.225-268-65-A-37  
 W9FGN. 36.468-257-58-A-39  
 W9VAY. 17.945-195-37-A-40  
 W9ZMN. 12.054-141-12-B-27  
 W9MWM. 10.450-115-38-A-17  
 W9N1G. 6.695-105-26-A-26  
 W9NHRV. 5.025-71-30-A-30  
 W9N9C. 2.090-46-19-A-14  
 W9N1KJ. 23-3-3-A-1  
 W9PMT (W1TVL, W3QLU, W8S DSO MNV)  
 32.395-296-55-B-1

## Wisconsin

W9RQM. 143.080-784-73-A-35  
 W9G1W. 100.909-563-71-A-40  
 W9W1N. 97.268-590-66-A-39  
 W9VOD. 93.150-548-69-A-32  
 W9WRK. 73.500-420-70-A-38  
 W9OT. 72.160-452-64-A-25  
 W9GLD. 70.725-410-69-A-30  
 W9SZT/9. 47.600-300-64-A-22  
 W9W1H. 42.625-280-62-A-27  
 W9WAN. 42.330-333-51-A-35  
 W9UDK. 40.900-300-55-A-25  
 W9D1K. 37.570-305-52-A-35  
 W9H1M. 36.338-255-57-A-28  
 W9YZA. 27.720-201-56-A-27  
 W9VZK. 26.063-248-15-A-19  
 W9CXY. 25.579-179-57-A-35  
 W9ZDM. 20.273-162-61-A-23  
 W9PFA. 17.523-163-43-A-25  
 W9NKK. 16.280-148-55-B-24  
 W9HFL. 14.677-155-38-A-20  
 W9W1H. 14.677-155-38-A-20  
 W9H1D. 12.700-127-40-A-19  
 W9CCO. 12.300-128-41-A-24  
 W9H1H. 11.655-126-37-A-14  
 W9FDN. 9.975-105-38-A-12  
 W9KZU. 9.500-100-36-A-11  
 W9YOS. 8.840-104-34-A-29  
 W9CXY. 8.124-109-39-B-14  
 W9DVB. 7.605-85-36-A-15  
 W9VZP. 5.925-79-30-A-14  
 W9W1L. 5.920-74-32-A-6  
 W9W1W. 5.148-77-36-B-13  
 W9PFA. 5.148-77-36-B-13  
 W9AEM. 4.100-69-24-A-7  
 W9W1U. 3.421-62-23-A-22  
 W9QGR. 3.161-61-28-B-7  
 W9H1T. 3.404-74-23-B-7  
 W9H1T. 3.404-74-23-B-7  
 W9H1H. 2.640-51-22-A-25  
 W9DPM. 2.470-38-26-A-11  
 W9JSE. 2.405-37-26-A-9  
 W9CFN. 1.600-35-26-B-16  
 W9H1A. 1.445-34-17-A-27

W9N9GHJ. 1235-40-13-A-22  
 W9CFO. 1106-31-15-A-7  
 W9N9GHY. 959-33-13-A-27  
 W9N9DUG. 429-18-10-A-4  
 W9LSK. 175-10-7-A-1  
 W9U1Q. 75-6-5-A-1  
 W9MGT. 3-1-1-A-1  
 W9N9KJ. 3-1-1-A-1  
 W9B7M (W9B7M, W9N9GWS)  
 7069-100-28-A-31

## DAKOTA DIVISION

## North Dakota

W9OAB. 103.599-630-67-A-40  
 W9EOZ. 73.775-456-65-A-32  
 W9CQA. 10.620-120-36-A-13  
 W9K2T. 6160-70-44-B-14  
 W9QGP. 2190-37-24-A-5

## South Dakota

W9SMY. 19.936-180-56-B-10  
 W9TLD. 10.900-110-40-A-1

## Minnesota

W9YCR. 139.650-804-70-A-39  
 W9TKX. 133.043-729-73-A-39  
 W9W1N. 62.672-413-64-B-31  
 W9JNC. 35.438-264-54-A-14  
 W9PDN. 34.810-236-59-A-12  
 W9LON. 32.341-216-55-A-27  
 W9H1L. 29.588-257-52-B-35  
 W9PHI. 17.538-157-46-A-24  
 W9FUX. 12.150-123-40-A-19  
 W9HPV. 7.480-88-34-A-28  
 W9QDL. 6.400-82-32-A-10  
 W9WAB. 4.875-65-30-A-10  
 W9QBW. 3.125-50-25-A-5

## DELTA DIVISION

## Arkansas

W5MSH. 92.400-578-64-A-36  
 W5MUN. 55.390-387-58-A-37  
 W5B1J. 28.554-218-53-A-29  
 W5WUW (W5B1J, W5WUW)  
 10.865-107-41-A-11

## Louisiana

W5KC. 141.468-797-71-A-38  
 W5MCT. 124.740-699-72-A-40  
 W5W1C. 106.265-629-68-A-40  
 W5W1M. 42.853-291-61-A-25  
 W5NDV. 41.374-281-59-A-30  
 W5B1. 19.110-156-49-A-11  
 W5TRQ. 12.495-123-42-A-16

## Mississippi

W9APY/5. 72.371-463-63-A-22  
 W5ONL/5. 35.105-240-59-A-16

## Tennessee

W4THJ. 91.803-657-71-B-35  
 W4D1J. 55.644-563-65-A-40  
 W4VOS. 52.620-488-68-A-40  
 W4CYM. 71.400-422-68-A-34  
 W4UOA. 65.505-398-66-A-37  
 W4U1O. 63.860-412-62-A-40  
 W4WQT. 57.505-430-61-A-10  
 W4OCG. 50.750-350-58-A-22  
 W4DMT. 46.050-308-60-A-30  
 W4SCE. 30.113-220-55-A-36  
 W4UVP. 21.438-175-49-A-28  
 W4B1W. 16.675-150-46-A-40  
 W4TPI. 12.146-119-41-A-10  
 W4ACG. 5063-86-25-A-29  
 W4TIE. 1760-32-22-A-6  
 W4WON. 1020-26-16-A-5  
 W4UWA. 338-15-9-A-1  
 W4N4GFV. 3-1-1-A-1



# Results—1955 Novice Round-up

BY ELLEN WHITE, W1YYM

**M**ORE PARTICIPANTS, more operating savvy, and more fun for all personified the Novice Round-up, '55 style. With over 200 WN/KN competing Novices available to QSO, high tallies proved the rule, not the exception. After all, "... There is certainly no lack of operating ability on the part of the WNs. In most cases, excellent technique and a knowledge of operating procedure equal to that of the higher classes were exhibited." — W5VNV

After a quick look-see at how you placed in your section, you may wish to compare your score with the following call-area leaders. In this summary, only contact and section totals are given; full details may be found in the complete tabulation.

WN1CKA 180-45	KN6EVR 110-13
KN2HXR 219-42	WN7YAO 126-50
WN3ZKH 245-47	WN8SYZ 140-40
WN4FRO 139-47	WN9GWS 185-44
WN5FJN 173-61	WN0VKI 295-55

Two of the tougher states to acquire while working for WAS are Utah and Rhode Island. Not so in the NR! On our left, representing Rhode Island, WN1BIS supplied a multiplier for 134, while WN7WSS from the Beehive State (Utah) was a choice one for 115. In the words of KN6HAN, "The contest brought out a lot of the rarer ones!"

## Sidelights

From down Virginia way, W4YZC reports some of the best signals emanating from WN1ACD, KN2HXR, WN3ZKN, KN4ASU/4, WN8SWB, WN9GWS and WN9GBC. From the West Coast, San Joaquin Valley leader KN6HFA reports outstanding signals from W1MX, WN0VKI, KN4ANW, WN5FJN, W4VRT and W1WPO.

Giving testimony to sharp ears for faraway sections, the following licensees racked up 45 or more of those juicy multipliers. In descending order are eight star performers: WN5FJN, WN0VKI, WN7YAO, WN9GBC, WN7WSS, WN3ZKH, WN4FRO and WN1CKA. Not only

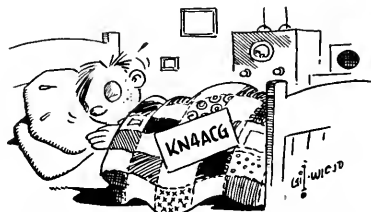
<sup>1</sup> W1QIS, W1WPR, W1YYM ops. <sup>2</sup> W1YFM, W4YHD, W5ZID ops. <sup>3</sup> W0IIAW, opr.

that, but "during the contest I worked my first ZL and an XE" reports WN1CKA.

"After having taken part in two SS contests, I believe that the NR is about four times as difficult a test of operating ability." — W1SSZ. Yet, in spite of QRM, QRP, QSB and homework, twelve of the boys came through with 150 or more QSOs. Well-earned plaudits to WN1CKA, KN2HXR, KN2ICU, KN2JKC, WN3AML, WN3ZKH, WN4GFT, WN5FJN, WN9GWS, WN9HFB, WN9ICE and WN0VKI.

## Round-up Remarks

"My copying has improved; the NR helped me recognize numbers at faster speeds." — KN2JGU. . . . "Between the kitchen, the store, the 'phone and the neighbors I managed to get in 35 hours of operating time. Had good technical



"I'D LIKE TO CATCH UP WITH THE GUY THAT GAVE ME THE FLU ON THE NEXT TO THE LAST NIGHT OF THE CONTEST."

advice from OM W7HMQ. Bring on the Field Day." — WN7WHV. . . . "My ears are still red after being broken in by a brand-new set of headphones." — WN9ILE. . . . "Found some snappy operators for future FD and SS contests." — W5OMK. . . . "That WN1AND — what a beautiful fist!" — W1VNX. . . . "FB 60% QSL percentage." — W1AW. . . . Our nominee for the neatest log keeper (indicating 35-v.p.m. certification): KN4ASU/4.

## Non-Novice High Scorers

Again this year, many non-Novice stations supplied a helping hand. Calls shown in bold-face are those of last year's participating WN/KN operators, returning in '55 to help the new licensees. The following scores are shown in alphabetical order. W1AW 3321,<sup>1</sup> W1BDI 720, W1CDD 1218, W1GKJ 900, W1JYH 3132,

Equipment of aid to WN7WHV (Puyallup, Wash.) in acquiring 162 QSOs in 41 sections consists of a Lyco 600 for 21 Mc. topped by a Communicator for monitoring the Pierce County c.d. frequency, a Ranger for 40 and 80 (beneath the RME 23 preselector), and an HRO-50 with Selectoject. Alice collects elephants too!

**QST for**



W1MX 11,328,<sup>2</sup> W1RFC 1392, W1SAD 1520,  
W1SSZ 1580, W1VNX 1817, W1WPO 7600,  
W2LS 1344, W2MTA 736, K2AFQ 186, K2DEM  
21, K2DNW 45, K2EDH 4192, K2EIU 4480,  
K2EPP 352, K2GDE 3240, K2GMI 1281,  
K2HVN 5285, W3FY 3480, W3NRE 6300,  
W3RRI 1173, W3WAF 819, W3YHU 1206,  
W4BXV 3382, W4BZE 8600, W4IA 798,  
W4OMW 924, W4WRM 247, W4YZC 930,  
W4ZYV/2 6, W5VNW 1100, W5WUR 2400,  
W6PCA 360, K6AUZ 616, K6BBD 128, K6CUX



238,<sup>3</sup> W7PQJ 63, W7VIU 1152, W7VWS 63,  
W8JDN 5510, W8MSK 704, W8NGU/5 3255,  
W8NMM 3848, W8NWH 1026, W8OMK 2320,  
W8OTI 4012, W8QXQ 5586, W9CLH 3232,  
W9KLD 2263, W9SZR/9 3696, W9WAN 6300,  
W9WJV 6270, W0JFG 525, VE3BSW 440.

#### ATLANTIC DIVISION

##### Eastern Pennsylvania

WN3AML 7995-205-39-36  
WN3YTM 5850-135-39-39  
WN3ZTB 5313-151-33-34  
WN3ZRQ 4860-152-30-37

##### Mid.-Del.-D. C.

WN3ZKH 11,515-245-47-31  
WN3ZSR 2398-109-22-20  
WN3ZGN 1007-38-19-7  
WN3ZJV 270-20-9-28

##### Southern New Jersey

KN2JKC 8040-186-40-35  
KN2KDO 2068-94-22-36  
KN2JGU 1596-74-19-17  
KN2JHW 1520-65-19-25  
KN2JWZ 120-10-8-11

##### Western New York

KN2JVN 1260-48-20-26  
KN2JAD 768-38-16-14  
KN2JDP 459-27-17-12  
KN2JWG 360-24-15-7  
KN2JZT 114-6-6-1  
KN2JVH 28-7-4-5

##### Western Pennsylvania

WN3ZHQ 5705-143-35-29  
WN3ZQW 5168-127-34-27  
WN3ZGL 1416-59-24-15

#### CENTRAL DIVISION

##### Illinois

WN9HFB 7421-161-41-10  
WN9ICE 7224-153-13-37  
WN9GBC 6550-131-50-34  
WN9JDJ 5796-123-42-  
WN9LBZ 2100-75-28-28  
WN9GCV 644-26-14-16  
WN9MAK 207-13-9-13  
WN9KMK 140-10-7-10  
WN9JFE 42-4-3-2

##### Indiana

WN9HHN 5499-126-39-37  
WN9HNJ 3367-91-37-35  
WN9ICL 2100-60-28-11

##### Wisconsin

WN9GWS 9020-185-44-39  
WN9DCG 2673-81-33-24  
WN9KHW 2268-84-27-36  
WN9HAH 2044-73-28-24  
WN9GYE 60-12-5-2  
WN9JDO 56-8-7-14  
WN9KFW 16-8-2-7

#### DAKOTA DIVISION

##### Minnesota

WN9UKY 768-33-16-25

#### DELTA DIVISION

##### Arkansas

WN5IED 2201-71-31-10



Leading the Ninth call-area listings is reason enough for the pleased look of WN9GWS! This Milwaukee Radio Amateur Club member sports an SX-71 and 6AG7-807 rig. Antennas are coax-fed half waves on 80 and 40. Ron's fine score summed up 185 contacts in 11 different ARRL sections. (Photo by W9MIOT)

##### Louisiana

WN5GAI 3990-100-38-24  
WN5FSN 1200-35-24-10

##### Mississippi

WN5DRP 3536-80-31-27  
WN5FPI 912-38-21-3

##### Tennessee

WN4FRO 7473-139-47-25  
KN4ACG 5031-110-39-23  
KN4AOJ 2910-82-30-23  
KN4ACF 640-25-16-14  
WN4GFV 368-23-16-10

WN8RSK 2610-80-29-35  
WN8SAQ 2511-81-31-27  
WN8SWB 1650-60-22-16  
WN8RMF 1632-68-24-35  
WN8TDL 1564-48-23-25  
WN8TJF 1550-62-23-23  
WN8QIZ 1430-55-26-36  
WN8SRG 931-39-19-10  
WN8UPH 882-42-21-19  
WN8SCW 714-27-17-8  
WN8TTO 558-31-18-  
WN8TJJ 279-16-9-11

#### HUDSON DIVISION

##### Eastern New York

KN2HXR 9618-219-42-32  
WN8RGF/2 3906-106-31-23  
KN2HOU 3074-93-29-19  
KN2IQL 1850-74-25-30  
KN2KET 1302-93-14-21  
KN2JQZ 1080-54-20-22  
KN2GZB 147-21-7-4

##### N. Y. C.-L. I.

KN2ICU 7421-166-41-23  
KN2IBH 3683-112-29-21  
KN2HMG 1659-64-21-15

(Continued on page 140)

During the first week of the contest, WN0VKI paused to rebuild his 5763-4D32 rig. Result? Seventy-five watts and fine operating ability (plus an HRO-60) garnered 295 QSOs for Dick! This contest leader from Omaha worked 47 of the 48 states in his first 4 months on the air. Vermont is still the elusive 48th.

May 1955





## HAMFEST CALENDAR

**ALABAMA** — The Birmingham Amateur Radio Club will hold its annual Hamfest at the State Fair Grounds, Birmingham, Sunday, May 15th. For further information and tickets write P. O. Box 603, Birmingham, Ala.

**GEORGIA** — The Atlanta Radio Club hamfest will be held May 28th-29th. The place for the Saturday night Dutch supper is Joe's Steak House on the four-lane highway near Marietta. Guests will be accommodated at the Marietta Motel and other motels nearby. The Sunday hamfest will be at Robertson's Tropical Gardens on West Paces Ferry Road at the *Chattahoochee River*. Barbecue chicken will be served, and refreshments will be available. Tickets are \$3.00. Tickets and motel accommodations may be handled through Jack Farr, W4TJS, 572 Wells Ave., Hapeville, Ga., or Tom Moss, W411YW, 1009 Connally Drive, East Point, Ga.

**INDIANA** — Clifty Falls picnic, sponsored by the Madison Amateur Radio Club, will be held at Poplar Grove, Clifty Falls State Park, Madison, on Sunday, May 15th, 10 A.M. to 4 P.M. No registration fee; the only cost is a 10 cent charge for admission to the state park. This is a family affair, so load up the lunch basket, XYL and the kids for a big time. Only a short drive from Cincinnati, Louisville or Indianapolis. Plenty of shelter, so come rain or shine. For further information contact W9QOT, R.F.D. No. 6, Madison, Ind.

**ILLINOIS** — Sunday, May 22nd, Fourth Annual Mississippi Valley Hamfest at Rock Island County Conservation Grounds on Big Island, Milan. There is a new road along the Canal fellows so the going will be smooth. There will be plenty of good food and fun for all. Advance registration tickets are \$1.25 or \$1.75 at the gate. For advance registrations write Harry Studer, W9RYU, R.R. No. 1, Milan, Ill.

**ILLINOIS** — Starved Rock Radio Club Hamfest, June 5th, at a beautiful new and larger site, overlooking the *Illinois River* at the South edge of Ottawa, Ill. Follow Rt. 23 south through Ottawa, cross *Illinois River* bridge, go up hill, and turn left at Center Street eight blocks to CIO picnic area. Site features large dining hall and kitchen, new auditorium, meeting rooms and space for display of equipment. For the ladies and children, special attractions, all modern facilities, lots of picnic tables, playground equipment, swimming pool, etc. The usual good program and features of previous hamfests. Registration \$1.00 if postmarked before May 28th, \$1.50 at hamfest. Listen on 3940, 3920 and 3515 kc. for late news or write W9MKS, Utica, Ill. for details and advance registrations.

**KANSAS** — The Hi Plains Amateur Radio Club sixth annual Hamfest will be held at Plains, May 22nd. Registration will be \$1.00. A covered-dish luncheon will be served at noon, and everyone is invited to attend. Please bring a covered dish and service for your own group.

**KANSAS** — The Central Kansas Radio Club, Salina, 7th annual Hamfest will be held June 5th. Starting at 10 o'clock till (?); all inquiries should be addressed to Howard Baker, 404 Woodlawn, Salina, Kans.

**MISSOURI** — The Greater St. Louis Radio Amateur's annual Hamfest will take place May 22nd. Games, entertainment for adults and children. Refreshments obtainable on grounds. Admission, adults \$1.00, children free. Creve Coeur Farmer's Club.

**NEW MEXICO** — The Amateur Radio Caravan Club of New Mexico, Albuquerque chapter, will sponsor the 5th annual New Mexico State Hamfest on Saturday and Sunday, June 4th and 5th, in Albuquerque. Stations will be on 29.6 Mc. and 3838 kc. to direct mobiles into Albuquerque. Registration will begin Saturday, June 4th; \$2.50 in advance and \$3.00 at the gate. All amateurs and their families, both in and out of the State of New Mexico, are invited to attend. For further information contact the club at 107 Washington St., S.E., Albuquerque, N. M.

**NEW YORK** — The Rochester Amateur Radio Association will hold its annual Western New York Hamfest Saturday May 21st in the Doud American Legion Post at 898 Buffalo Road (Rt. 33) near the western city limits of Rochester. The tops in speakers and honored guests as usual. Whether your special interest is mobile, DX, traffic, v.h.f., u.h.f., c.d., hi-fi, or renewing old acquaintances, don't miss this one! Registration from 1 P.M. to 5 P.M.

Banquet at 7 P.M., \$3.75 per person as always. For advance registration write to RARA, P. O. Box 1388, Rochester 3, N. Y.

**NEW YORK** — The New York Radio Club is holding its third annual Picnic and Transmitter Hunt at Bethpage State Park, Long Island, N. Y., on Sunday, May 22nd, starting at 11 A.M. Women and children free; all OMs \$1.00. All hams are welcome and a good time is assured.

**OKLAHOMA** — The North Fork Amateur Radio Club of Western Oklahoma will hold its Third Annual Hamfest and Picnic at the Quartz Mountain State Park and Lugert Lake on May 21st and 22nd. Registration fees will be \$2.50. For further information contact Jay Thompson, W5ZZP, Sayre, Okla.

**PENNSYLVANIA** — The Breeseshooter's Tri-State Hamfest will be held on Sunday, May 22nd, at the Lodge, North Park, Pittsburgh, Penna. Registration free. Come one, come all!

**RHODE ISLAND** — The Providence Radio Association will again hold the largest Rhode Island gathering of amateurs, its annual Dinner Dance at Johnson's Hummocks on May 14th at 8 P.M. Entertainment for all.

**TEXAS** — The South Texas Emergency Network will have its tenth annual Convention in Kerrville on May 27th-29th. There will be a barbecue, two dances, two water carnivals, three transmitter hunts, a swap session, and the usual banquet and business sessions. There will be many entertainment and educational features.

## FEED-BACK

In Hadlock, "Improved Audio Circuit for the 50-Mc. C.D. Unit," page 36 of the March issue, Fig. 2 should show a 0.1-megohm screen dropping resistor for the left-hand section of the 6U8.

In Fig. 2 of Thomason, "Mobile S.S.B. Receiver for 80 and 40," in March *QST*, a connection should have been shown between the cathode of the 6BSQ7 and junction of the 0.15-megohm and 2700-ohm resistors and 15- $\mu$ f. capacitor.

A not-too-serious error got past us in "A 5-Band Antenna Coupler," by McCoy, in April *QST*. In Fig. 2, a jumper should be shown between Pins 2 and 4 in "D." If the jumper isn't used, only half of the total capacitance is available.

## Strays



At the request of the local government, VP2DL, Windward Islands, B.W.I., broadcast a debate put on by native officials. The program was transmitted on a non-ham frequency and met with much enthusiasm. *L. to r.:* His Honor, Mr. Josse, Asst. Administrator; Government Secy, Hugh Grell, VP2DL; Missionary Merritt Hoath, VP2DL; and Mr. William Surbrook, VP2DA.





# Hints and Kinks

## For the Experimenter



### LUCITE REPLACEMENT FOR WINDOW GLASS

A SHEET of  $\frac{1}{8}$ -inch lucite, cut to size and used as the replacement for a cellar windowpane, provides an easily worked surface for mounting feed-line feed-through insulators, etc. Mount the lucite in place with regular glazier's tacks and putty. Save the window glass for the day when it becomes desirable to return it to the frame.

— E. M. Fry, K2CW

### FULL RANGE SPEED CONTROL FOR SEMIAUTOMATIC KEYS

A HIGHLY successful method of controlling the speed of a bug or semiautomatic key is shown in Fig. 1. With this system, it is possible to slow down the dot frequency instantaneously to any desired rate.

The drawing is more or less self-explanatory. The only parts added to the original key are a hairpin-shaped piece of iron wire and one or more small cylindrical Alnico magnets such as those used in speaker manufacture. The hairpin is held in place under the thumbscrew which normally holds the sliding weight in position and the magnet or magnets hold themselves in the cradle formed by the hairpin.

The hairpin can be made from a section removed from an iron coat hanger. Before mounting the hairpin, move the regular weight up to

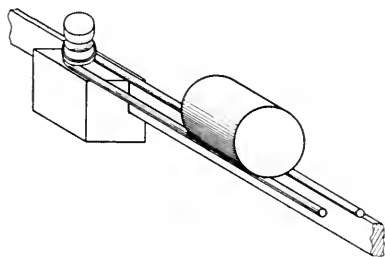


Fig. 1—Detail drawing of the speed-control for bugs or semiautomatic keys.

the maximum speed position. When the cradle is locked in position, orientate it with the open end facing toward the rear of the key. Thus, by merely removing the magnet or magnets, top speed is available without need for loosening any screws. To come down to a slower speed, put a magnet or two on the cradle (preferable sizes are those having a diameter measuring between  $\frac{3}{4}$  and  $1\frac{1}{4}$  inches) and slide same to the most effective position. Even with the heaviest combination of weights on my bug, and while keying at the rate of less than six dots per second, I can

get over 50 cleanly formed dots before the bug comes to rest.

For a few weeks after this idea was first put to work, I had the extra magnets lying around on the desk where they were easily misplaced. When I finally remembered the basic properties of magnets, I simply placed them against the front panel of my receiver where they stay put until wanted.

— Cyrus T. Read, W9AA

### PROTECTION OF TETRODE SCREEN GRIDS

ONE of the disadvantages of using a fixed screen supply is the excessive screen dissipation that occurs when plate voltage is unintentionally removed from the tube. This drawback of the fixed-supply system can be overcome by feeding the screen through the contacts of a normally open s.p.s.t. relay as shown in Fig. 2. Voltage for the relay is obtained from the

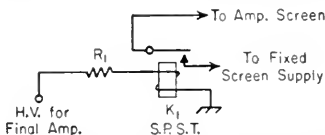


Fig. 2—Protective circuit for fixed screen-supply operation.

high-voltage plate supply through the dropping resistor,  $R_1$ . The value of resistance and the wattage rating of  $R_1$  will be determined, using Ohm's Law, by the resistance of the relay winding and by the output voltage of the h.v. supply.

The most desirable feature of the system is that it is automatic. If the plate voltage is removed from the tube because of a blown fuse, defective component or the unintentional opening of a control switch, the relay opens and breaks the screen voltage lead.

— Don Priebe, W8MQQ

[EDITOR'S NOTE: This circuit is quite similar to the one described by W0NCV in *QST* for December, 1952. However, in the event of an opening in the relay winding, W8MQQ's arrangement does not affect operation of the power-supply bleeder as would be the case with the previously-described installation.]

### HOMEMADE RUBBER STAMPS

IN "Hints and Kinks," *QST*, November, 1954, there appeared a brief article on homemade QSL cards printed with a rubber stamp. This prompts me to call attention to an article entitled, "You Can Make Your Own Rubber Stamps," presented in the September, 1954, issue of *Popular Science*.

— Herbert Sinofsky, W2GKS



# Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

## PIRATE G

44 Hawkhurst Road  
Coldean, Brighton  
Sussex, England

Editor, *QST*:

I am being inundated with QSL cards, mostly from W hams, purporting to be confirmation of 3.5-Mc. contacts (c.w.) over the past few months and nearly all during the hours 0100-0400 GMT. All report high signal strength — which gives me an impression that the station making these contacts may be on the American continent. At any rate, they are all "pirate" contacts as I do not work 3.5 Mc. and *never* work during the "little hours"! . . .

. . . Their cards sent to me reporting the "contacts" with my station are being held for evidence for the G.P.O. here! Incidentally, my name is Cyril and nearly all the cards sent address me as Carl so I guess my "pirate" is using that name on the air.

— C. T. Fairchild, G3YY

## THIRD-PARTY TRAFFIC

MARS/Amateur Station K3WBJ  
Walter Reed Army Med. Center  
Washington 12, D. C.

Editor, *QST*:

If one listens on 20 meters he is certain to hear Stateside stations handling traffic with the DL4s, Gs, C8s, Fs and others. Most Stateside amateurs do not realize that FCC prohibits third-party traffic with foreign countries, excepting Liberia, Cuba, Canada, Chile, Peru, Ecuador, and those stations operating beyond the continental U. S. A., such as KZ, KP, KG, KL, KA, etc., who are licensed by FCC.

The only way traffic can be passed to the U. S. A. from Germany is on MARS frequencies where the German station becomes a U. S. military station using military calls issued by chief Army or Air Force MARS, Pentagon, Washington, D. C.

It is possible that the Stateside amateur does not know this or is too kind-hearted to reply "Sorry OM, but we are not supposed to handle traffic with DL4 stations."

To those who are accepting 'phone-patch traffic and written messages from DL4 amateurs, I say let's do our duty and follow the rules of FCC — no traffic from Germany on the amateur bands.

— Pfc. Merle W. Wynn, W1DLO

[EDITOR'S NOTE — Message traffic for U. S. military personnel overseas is permitted only with amateur stations identified by properly authorized call signs having a one- or two-letter prefix beginning with W or K.]

## NOT THIS WAY

1595 N. Virginia St.  
St. Paul 3, Minn.

Editor, *QST*:

. . . In tuning across 14 Mc. I hear a weak ET3 in Ethiopia. When he finishes his CQ I call him, but he comes back to a W1. After giving the W1 his report and expressing delight in working the W1 again, he turns it back to the W1. This W1 immediately opens the formalities with the words "Say, I worked you two months ago and I still haven't got your QSL — how come? Also, if you run across that ET2 in Eritrea, tell him I haven't got his, either."

If I had been the ET3, I would have thereupon turned off the rig and slunk away, but the ET3 gamely comes back and says, "Say, OM, mail delivery in this country is really very poor compared to the U. S. A. We consider if we get a letter from your country in two months that that would be

normal delivery time. I also been off the air since last working you as my 837 oscillator failed and I just managed to bum a substitute from a passing camel caravan." He then turns it back to Soft-hearted John, the W1 station, whose first words of sorrow, condolence, and understanding go like this:

"Well, if mail delivery in your country is so lousy as to take 2 months, you'll probably be getting my card any day so how's about mailing me your card airmail today?" I never did hear the ET3 come back to that bit of genius so maybe even he forgot he was a gentleman.

To my mind a suitable cartoon to illustrate how bad this QSL mania has become would be one like "Gil" made up years ago of a big bandit with a blackjack in his hand hovering over a small cringing citizen and overheard the words "Gimme your handle"; but in this case substitute the words "Gimme your QSL."

. . . I wonder how many U. S. hams understand the value to a foreign ham of postage. Eight cents is plenty but even to me 25 cents for airmail is pretty strong between paydays. I looked up the ET3 and he was listed as an Air Force man so I would presume even he ate off crockery and not gold plate. (Ethiopian Air Force man, that is.)

Every time a DX station calls CQ, hordes of U. S. stations call him and flood him with QSLs. He no doubt already has hundreds of U. S. cards, but being a gentleman, he is obliged to mail his in return and postage can become an important item. Include return postage coupons to defray the return postage and to help remind him to QSL. If he happens to be wealthy, he can turn the postage money over to his favorite charity.

Don't lose your head if a foreign ham doesn't QSL. Who knows — maybe he is having labor trouble with the fellows that turn his tread-mill-powered generator like the OQ5 in the Belgian Congo I read of years ago. After all, it's not quite as bad as having a doctor tell you that you have cancer.

— Cliff Proetz, W0PDN

## 'PHONE-BAND C.W.

133 Cherry Ridge Rd.  
Peoria, Ill.

Editor, *QST*:

I read the letters sent in by W5UWQ and W4UWA (March 1955, p. 46) and I agree with both of them, to a certain extent.

Contrary to what most 'phone addicts seem to think, c.w. is not "a thing of the past"; it plays just as large a rôle in ham radio as 'phone does. I will admit, however, that some c.w. operators are inconsiderate enough to work in the 'phone bands, and I agree that these bands should be set aside for 'phone only.

As for s.s.b., the letter from W8HKE (right below the other two letters) hits the nail on the head. I hope most of the anti-s.s.b. men read it carefully.

Let's face it; all three are here to stay. Instead of arguing about which one to eliminate we should try to get 'phone and c.w. separated, and convince those d.s.b. guys that s.s.b. is doing more good than harm.

— Bill Wildfong, W9IWC

58 Throop Ave.  
Auburn, New York

Editor, *QST*:

In reply to W5UWQ's letter griping about c.w. on the 'phone bands — I agree with him completely. However, I feel that something should be done about the overlapping of the VE 'phone band and the American Novice band on 80

(Continued on page 144)

# YL NEWS and VIEWS

BY ELEANOR WILSON,\* W1QON

## Additional YL Clubs

The following augments information on YL clubs given in this department last month:

**Canal Zone QRMarys** — YLRL unit; organized 1952; seven members (all of the Canal Zone YLs); meets bimonthly at members' homes; no dues; president KZ5DG, Grace Dunlap, Box 28, Balboa Heights, C. Z.; issues the Canal Zone QRMary-Go-Round Certificate.

**San Diego Young Ladies Radio League** — YLRL unit; organized 1947; seven members; meets second Friday of the month at the American Red Cross Building, 3650 5th Ave., San Diego, Calif.; no dues; president, W6OLP, Alice McCleary, 1524 Missouri St., San Diego 9.

**NYL Club** — Composed of wives and feminine relatives (licensed and nonlicensed) of members of the Black Hills ARC, Rapid City, S. Dak.; organized 1948; meets monthly in members' homes; dues \$1.25 a year; purpose is to assist the Black Hills ARC with its annual hobby show and to aid in its recreational program.

## Sentiments on C.W.

What is c.w. to me? It is a magic key that opens many mysterious doors — an ethereal bridge forged of countless dits and dahs, borne aloft on the wings of light, space, and divine mystery . . . a sparkling want that spans great distances or hops backyard fences to afford its disciples a brief glimpse into the lives of others. . . . It is a lilting language which commands either detached respect or frank and warm love, depending upon whose mind it touches. . . . C.w. is a subtle bonding agent that delicately welds two strangers into an intimate oneness for a fleeting moment . . . a delightful, tantalizing and yet thoroughly satisfying mistress to all her lovers.

These thoughtful words were copied by OM W6KMJ, Dan Peterson, of Long Beach, during a recent 40-meter QSO with W6OQY, Betty Entner, of Coronado. Dan, impressed by Betty's "beautiful bug fist" and devotion to c.w., shares her sentiments with us with the hope that they may strike a spark in the hearts of many struggling YL Novices and inspire them toward the mastery of the necessary 13 w.p.m. for their General Class license.

\*YL Editor, QST. Please send all contributions to W1QON's home address: 318 Fisher St., Walpole, Mass.

## COMING YL GET-TOGETHERS

May 20th-22nd — LARK Convention,  
W9 YLs, Alorton Hotel, Chicago.  
Write W9MYC.

June 24th-27th — First YLRL International Convention, Hotel Miramar,  
Santa Monica, Calif. W6UHA, general  
chairman.

## YLs You May Have Worked

Lenore Kingston Conn, W6NAZ, has been a familiar face and voice to countless amateurs and to the general public as well for some 15 years. Licensed in 1939 (as W9CHD, later W2NAZ), she has combined her multiple radio activities with years of free-lancing as a radio actress and a commercial announcer for radio and TV.



Considered "a sort of 'pioneer'" in TV, she started work in that medium in 1941. Lenore is a member of the Los Angeles YLRL and a charter member of the YLRL (Vice-Pres., 1947). She is currently editing a second edition of the YLRL Directory, which will contain information on more than 500 YLRL members. She also edited the first edition in 1948. Married to W6MSC, technical director for NBC-TV, Lenore divides her hobby time at her Sherman Oaks QTH between c.w. and 'phone, primarily on twenty. Lenore's friends testify that she is a conscientious worker and deserves the success she has enjoyed in her vocation and avocation.

## Keeping Up with the Girls

The annual luncheon and installation of officers of the N.Y.C. YLRL took place Feb. 19th at a downtown restaurant. YLs who attended were new officers W2IQP, Pres.; W2IGA, V.P.; W2MYV, Secy.; Helen Zuparn, Treas.; and members JF2s EEO, EUL, JZX, OWL, PZA, QGK, QWL, TBU, K2AFR, and KN2DPN. . . . Three KZ YLs plan Stateside vacations this summer: KZ5KA, Kay (W9RIH), KZ5PL, Pat; and KZ5DG, Grace (W6DLU). KZ5DG worked all but six of her 240 contacts in the YL-OM contest on 15 'phone. . . . WSHWX, Lillian, hasn't missed a session of the 40-meter YLRL net since its inception in 1953. . . . W4YYJ, Lois Anne, has her 25w.p.m. Code Proficiency Certificate. . . . VE3DEA, Denny, attended a ham gathering in Scotland and enjoyed meeting 150 OMs, some of whom she has QSO'd on 20 'phone since returning home to Toronto. . . . During the Mothers' March of Dimes for polio, W4UDI and W4UDQ relayed to mobiles who picked up money at various collection points in Memphis, Tenn. Lenette and D. B. also assisted with relays in a welcome-home reception for the National March of Dimes poster child. . . . W1ZOL, Leta, of Bangor, Me., has assembled a Johnson Ranger and is enjoying 40 meters. . . . W1LYR continues to handle considerable traffic for Presque Isle and vicinity. Along with W1UZR, Rita, and W1YTE, Isabel, Hazel checks into the Sea Gull Net daily. . . . W1YYM, Ellen, of Hq., reports that about 6 per cent of participating Novices in the 1955 Novice Round-up were YLs — by call: WN1COL, KN2s INQ, KER, WN3YTM, WN4HYV, KN6s EIG, HTC, HWH, WN7WHV, WNSUAP, JN0s UZM, VGE, VVY. . . . W4RLG, Frances, YLRL chairman of the Fourth District, is home after almost a year in a hospital. . . . Two new harmonics announcements: a boy in February to W3RXV, Peg, editor of YLRL Harmonics, and OM W3RXW; a girl in January to W4HHI, Joanne.

(Continued on page 148)

# Armed Forces Day Program—May 21st

**T**he Army, Navy and Air Force invite all U. S. amateur radio operators to participate in the Armed Forces Day Program for 1955. The amateur activities are jointly sponsored by the Army Signal Corps, Air Force Directorate of Communication, and the Naval Communications Division.

A receiving contest will be open to anyone who can copy International Morse Code at 25 w.p.m. Listeners who submit a perfect copy of the transmission will receive a Certificate of Merit, attesting to their code-copying proficiency, from the Secretary of Defense.

A military-to-amateur transmitting and receiving test will be conducted for all holders of valid U. S. amateur radio licenses. Headquarters stations of the Army, Navy and Air Force will establish radio contact with amateur stations and will acknowledge these contacts with special QSL cards. Each service headquarters station will QSL separately so amateurs will have an opportunity to qualify for three different QSLs.

In addition, a radioteletype transmission will be sent from MARS Headquarters and from official Navy stations. Any amateur station capable of receiving radioteletype transmissions is invited to copy the special message. A special letter of acknowledgment will be awarded to each amateur who participates.

MARS directors and Naval Reserve organizations are being urged to feature radio activities at their military installations as part of this year's plan for inviting the public to visit the Armed Forces "at home" in 1955.

## C.W. Receiving Competition

The c.w. receiving competition will feature a message from the Secretary of Defense. All individuals, amateur operators and others, are eligible to participate. A Certificate of Merit will be issued to each participant who makes perfect copy.

Transmissions will be at 25 w.p.m. on the following schedules:

May 21st	Station	Frequencies (Kc.)
1900 (EST)	WAR	14,405; 20,994
1900 (EST)	NSS	121.95; 4390; 9425; 12,804; 17,050.4; 22,491
1900 (EST)	AIR	3347; 6997.5; 143,460
0600 (GCT) (0100 EST May 22, 2200 PST May 21)	WAR	14,405; 20,994
2200 (PST)	NPG (Navy Radio, San Francisco)	114.95; 6428.5; 9277.5; 12,966; 17,055.2
0100 (EST) (May 22)	AIR	3347; 6997.5; 143,460
1100 (GCT) (2000 Item May 21)	NDT (Navy Radio, Yokosuka)	2287.5; 4545; 9427.5; 13,471.5; 16,445; 23,010

Each transmission will commence with a five-minute CQ call. It is not necessary to copy more than one station, and no extra credit will be given for doing so. Transmissions should be submitted

"as received"; do not correct possible transmission errors. Punctuation will be spelled out and should be copied as sent. Copies should be mailed to Armed Forces Day Contest, Room BE-1000, The Pentagon, Washington 25, D. C. Time, frequency, and call letters of the station copied should also be included.

## Military-to-Amateur Test

Military stations WAR, NSS and AIR will be on the air between 1800 and 2400 EST on 21 May 1955, to contact and test with amateur radio stations. The military stations will operate on spot frequencies outside the amateur bands as follows:

	Frequencies (Kc.)
WAR (Army Radio Washington)	4025 (A-3) 6997.5 (A-1)
NSS (Navy Radio Washington)	4010 (A-1) 7375 (A-1) 14,385 (A-1)
AIR (Air Force Radio Washington)	3347 (A-1) 7635 (A-3) 14,405 (A-3)

Contacts will consist of a brief exchange of location and signal report. The military station will not be permitted to handle traffic nor exchange messages.

## Radioteletypewriter Receiving Competition

The radioteletypewriter receiving competition will feature a special joint message from the Chief Signal Officer, USA; the Director, Naval Communications, USN; and the Air Force Director of Communications. A letter of acknowledgment will be sent to each amateur participant who submits a copy made from the radioteletype transmission of this message. Transmission will be at 60 w.p.m. on the following schedules:

May 21st	Station	Frequency (Kc.)
1300 (EST)	NDC (Norfolk, Va.) AIR (Washington, D. C.)	7375 7915
1300 (CST)	NDS (Great Lakes, Ill.) A4USA (Atlanta, Ga.)	7375 5760
1300 (MST)	NDF (New Orleans, La.) or NDW2 (Salt Lake City, Utah)	7375
1300 (PST)	A5USA (Fort Sam Houston, Texas) NDW (Treasure Island, Calif.) AF6AIR (Hamilton AFB, Calif.)	14,405 7375 14,405

Each transmission will commence with a period of ten minutes of test and station identification to permit amateurs to adjust their equipment. At the end of the test period, the message will be transmitted. Copy should be submitted "as received" to Armed Forces Day Contest, Room BE-1000, The Pentagon, Washington 25, D. C. Time and call of station copied and name and call of amateur receiving the transmission should be included.



CONDUCTED BY EDWARD P. TILTON, WHDQ

THE best 50-Mc. season in years could be about to begin. Interest in the band, lagging for some time, shows every sign of coming back strong. How well it comes back will depend on how well we respond to the opportunity that is inherent in the opening of the band to Technician Licensees, effective April 12th. Conditions are almost sure to be better than for several years, and for the first time we have a real incentive that will attract new hams. Now it's up to 50-Mc. enthusiasts the country over to make the most of this chance to sell the band, and keep it sold.

Why has 50-Mc. interest lagged? We have to go back to the resumption of activity following World War II for all the factors. One certainly was war-surplus gear, or the lack of it. Right at the most opportune time for the good of the 2-meter band, just as we were changing over from 112 to 144 Mc., thousands of SCR-522s and other surplus gear for the new band were dumped on the market. You could get on 2 for next to nothing, and v.h.f. men by the thousands snapped up the chance.

But the 6-meter band enjoyed no such bonanza. During the first months on the air, we had to make the shift from 56 to 50 Mc., at a time when there was no gear, surplus or new, for the new frequency. What we had we made ourselves, and it is a credit to amateur radio that we managed to show several hundred active stations on 50 Mc. almost at once. The 6-meter band was intriguing territory, and it attracted quite a few operators who were interested in more than just routine QSOs, though it was good for that kind of hamming, too.

Then came TVI. First in the New York area, then elsewhere as new TV stations appeared on Channel 2, 50-Mc. men found the going too rough for many of them. Since the lifting of the TV allocations "freeze" and the resultant open-

ing of many new Channel 2 stations around the country, the number of active 50-Mc. stations has dropped off from its already none-too-healthy level.

TVI in Channel 2, from 50-Mc. transmitters, is undoubtedly one of the more difficult problems hams have had to face, but there are redeeming factors, even here. Not the least of these is the less avid interest in TV on the part of the general public. Televiewing is more general than ever, of course, but with more than one channel available in nearly all localities, interference in one of them is not the life-and-death matter it once was. Remember, too, that it is usually a receiver fault; if your rig is "clean" you can stay on the air. And we are learning that the Channel 2 problem is not insurmountable. W2IDZ showed the way in a two part article in June and July, 1954, *QST*; an effort that won him second place in the "Outstanding *QST* Article of the Year" contest for 1954, incidentally.

How bad is the problem, anyway? It's rough, if you live in a weak-signal Channel 2 area, with a forest of TV antennas around you, but there are several tricks that can be employed advantageously, in addition to the filters described by W2IDZ. It's a local problem, mainly, so you can help things a lot by using a high antenna, to keep the main radiation pattern from warming up neighboring TV arrays. Low power works



This antenna system could be the means of achieving the long-sought goal of 144-Mc. DX up the Pacific Coast. A 30-foot parabola mounted on a dolly, so that it can be rolled around on the flat roof, it is erected on a 1200-foot elevation directly above Hollywood. The lights of the Los Angeles area stretch out for 20 miles toward Long Beach in this night shot by KN6GLG. K6EGP is seated at the left, W6COH climbs the framework on the rear of the reflector, and K6BNW is at the right. W6MJ, who sent the picture in, says that a kilowatt rig will be feeding the array this spring.



wonders, and fortunately, operating on 6 with no more than a few watts can be real fun.

If you don't have Channel 2 to worry about, 6 is likely to be one of the most TVI-free bands we have. What interference you do encounter is easily cured, in almost all cases except where Channel 2 is involved. In many areas, the extensive shielding and filtering, now so commonly practiced in low-frequency circles, may be wholly unnecessary. Thousands of U. S. hams could operate around the clock on 50 Mc. without the slightest worry about TVI. The main thing is to get them to try it!

A series of *QST* articles for the 50-Mc. newcomer begins in this issue. Technician licensees in all parts of the country will be building 6-meter gear in the coming months. One of them may be your neighbor, or a member of your radio club. Like any other beginner, he may need help. When he gets ready to go on the air he'll need someone to talk to. It's some time since we've had an opportunity to develop new activity on 6. Let's not mull this one!

### Here and There on the V.H.F. Bands

The best West Coast 2-meter DX in several years is reported this month by K6CAL, San Diego. Her 146.5-Mc. signals were heard by W6SKX/mm at a distance of more than 600 miles out in the Pacific, at 2037 PST, Jan. 28th. The report was delayed until the completion of a round trip by the *Hawaiian Rancher*, the ship on which W6SKX makes the run to K116-land regularly. Cliff has also heard the Bay Area repeater station, K6GWE, at distances of more than 300 miles.

Such reports point up the fact that conditions along the Pacific Coast may be very favorable for long-distance v.h.f. propagation. The K6GWE antenna is a simple nondirectional affair, and the 16-element beam at K6CAL/W6IBS was aimed at Los Angeles during the 600-mile reception, so the signal was heard off its side. How long will it be before home stations in San Diego or Los Angeles work into the Bay Area, or farther? We feel that such an event still awaits only the use of high power, big antennas, c.w. techniques, and selective low-noise receivers on regular schedules.

A likely prospect for such DX is the set-up shown in the adjoining photograph. This 30-foot parabola should provide the antenna gain (though we feel that the dipole is in the wrong position!) and the members of the Two Meter and Down Club who are in back of project say that there will be a high-powered rig feeding the big array this spring. This would seem to have what it takes to work K6GWE, W6AJF, or any of the other good set-ups in the Bay area, and it shouldn't stop there. With W6JIP, W7OKV and others around Portland using high power, and W7LHL reported to be nearly ready to go with a kilowatt rig in Seattle, why stop at the Bay area?

It's less than 1000 miles from Los Angeles to Seattle. Portland is about 850 miles. San Diego to San Francisco is less than 500 miles. Are these impossible distances on 144 Mc. in 1955? Having had a good look at the terrain along these paths last fall, we still feel that the best possible equipment and techniques will turn the trick within a month of the first time they're tried. We hope that there is provision in that Hollywood array for going to horizontal polarization, and that there will be a keying jack in that high-powered rig!

An attractive prospect for 2-meter DX off the Atlantic Coast is Bermuda. W3YJH sends word that VP9BM is to be on 2 regularly with 100 watts, a low-noise converter and a rhombic centered on Philadelphia. Address: M/Sgt. J. W. Wenglar, 1934 AACs Sqdn, APO 856, Postmaster, N. Y.

Another buddy of W3YJH (when they were DL4CK and DL4XS on 144 Mc.) is getting set to make a name for himself on 144 Mc. in North Africa. Jo visited us during the winter, full of plans for high power, rhombics, hot converters and other 2-meter DX necessities. Then he was about to hop off for Casablanca, and we're standing by to hear from him

## 2-METER STANDINGS

Call States Areas Miles			Call States Areas Miles			
W1RFU	19	7	1150	W6BAZ	3 2 320	
W1HDQ	19	6	1020	W6NLZ	3 2 360	
W1CCH	17	5	670	W6MMU	2 2 240	
W1IZY	16	6	750	W6GCG	2 2 210	
W1EJC	15	5	475	W6QAC	2 2 200	
W1UIZ	15	6	680	W6EXH	2 2 193	
W1KCS	15	5	600			
W1AZK	14	5	650	W7VMP	4 3 417	
W1MNF	14	5	600	W7JUC	3 2 247	
W1BCN	14	5	650	W7LEE	3 2 240	
W1DJK	13	5	520	W7YZU	3 2 240	
W1MMN	10	5	520	W7JUC	2 2 140	
				W7RAP	2 1 165	
W2ORI	23	8	1000			
W2UK	23	7	1075	W8BFQ	29 8 850	
W2NLY	23	7	1050	W8WXY	28 8 1200	
W2AZL	21	7	1050	W8WJC	25 8 775	
W2QED	21	7	1020	W8RNH	22 8 690	
W2BLV	19	7	910	W8DN	22 7 675	
W2OPQ	19	6	—	W8SVI	21 7 725	
W2DWJ	17	5	632	W8SHW	20 8 850	
W2AOC	17	5	600	W8SVI	20 7 690	
W2UTH	16	7	880	W8WRN	20 8 670	
W2PAU	16	6	740	W8BAX	20 8 685	
W2PCQ	16	5	650	W8JWV	18 8 650	
W2LHL	16	5	550	W8EP	18 7 800	
W2CFT	15	5	525	W8ZCV	17 7 970	
W2DFV	15	5	550	W8JWV	17 7 630	
W2AMJ	15	5	550	W8WSE	16 7 830	
W2QNZ	14	5	400			
W2BRV	14	5	590	W9EHN	23 7 725	
				W9FVJ	22 8 850	
W3RUE	23	8	950	W9EQC	22 8 820	
W3NKM	19	7	950	W9EHL	21 7 690	
W3IBH	19	7	650	W9UCH	21 7 750	
W3BNC	18	7	750	W9ZHL	21 7 —	
W3FFH	18	7	—	W9BPV	20 7 1000	
W3TDF	17	6	720	W9KPS	19 7 660	
W3KWL	16	7	720	W9MUD	19 7 640	
W3LXA	16	7	720	W9JEM	19 6 —	
W3TDF	16	5	570	W9LF	19 6 —	
W3GKP	15	6	800	W9ALU	18 7 800	
				W9JGA	18 6 720	
W4HHK	26	8	1020	W9WOK	17 6 600	
W4AO	23	7	950	W9MBI	16 7 660	
W4PCT	20	8	800	W9GAB	16 6 750	
W4JFV	18	7	830	W9BOV	15 6 670	
W4MKJ	16	7	665	W9LEE	15 6 780	
W4UMF	15	6	600	W9DSP	15 6 760	
W4ONC	14	7	500	W9JNZ	15 6 560	
W4JHC	14	5	720	W9DDG	14 6 700	
W4WCB	14	5	740	W9EAN	14 7 880	
W4TCR	14	5	720	W9QKM	14 6 620	
W4UBY	14	5	435	W9UIA	12 7 540	
W4IKZ	13	5	720	W9ZAD	11 5 700	
W4JFU	13	5	720	W9GTA	11 5 540	
W4ZBU	10	5	800	W9JBF	10 5 760	
W4UDQ	10	5	850			
W4DWU	8	6	625	W9EMS	26 8 1175	
W4TLA	7	4	850	W9IHD	24 7 870	
				W9GUD	22 7 1065	
W5RCY	21	7	925	W9ONQ	17 6 1090	
W5JTI	19	7	1000	W9INI	14 6 830	
W5ANL	10	5	1400	W9QAL	14 5 725	
W5CWW	10	5	1180	W9TJF	13 4 —	
W5AJC	10	4	1260	W9ZJB	12 7 1097	
W5MWW	9	4	700	W9WZG	11 5 760	
W5ML	9	3	700			
W5ABN	9	3	780	VE3AIB	20 8 890	
W5BERD	8	3	570	VE3DIR	18 7 790	
W5BXN	7	3	700	VE3BQ	14 7 790	
W5VY	7	3	1200	VE3DER	13 7 800	
W5FEK	7	2	580	VE3BPP	12 6 715	
W5ONS	7	2	950	VE2AOK	12 5 550	
				VE3AQQ	11 7 800	
W6ZL	3	3	1400	VE1QY	11 4 900	
W6WSQ	3	3	1390	VE7FJ	2 1 365	

any day that he is ready to take on all comers for a shot at the 2-meter DX record.

In the spring, the young man's fancy lightly turns to thoughts of expeditions to choice v.h.f. locations. Here are two trips that are well along in the planning stages. W8JWV and W8GUZ have been dreaming this one up all winter. They will operate W8JWV/4 from the summit of Mt. Mitchell, in North Carolina, the night before and during the June V.H.F. Party, the 7th, 8th and 9th. A 16-element array will be used on a 75-watt 2-meter rig with an 829B final. Operation will start around 1900 EST, June 7th. Mimeographed notices have already been sent out to a considerable mailing list, and final details will be sent just prior to the Party.

And here's one to delight the hearts of searchers after 50-Mc. WAS. W2QCY has decided that something has to be done about the lack of 6-meter stations in certain Western States. Roy is planning to load his panel truck with 6-meter gear and take off for Nevada, Utah and possibly other states that are keeping scores of 50-Mc. men from achieving WAS. This expedition will be well equipped as to gear, antennas

and emergency power, and operation is scheduled for the height of the DX season, in the latter part of June and early July. There should be a batch of new candidates for the coveted 50-Mc. WAS award before W2QCY/7 finishes his rounds. Right now, Roy is looking for two stalwart and experienced 6-meter DX men to accompany him. Any takers?

If you prefer picnics to expeditions, here are a couple of talk-eat parties scheduled for the same date, July 31st. The Annual Turkey Run V.I.F. Picnic, a fixture in Midwestern v.h.f. circles, will be held, as always at the State Park of that name, just north of Terre Haute, Ind. W9ZHL, Terre Haute, is the man to see for more information. And W8NOH, Grand Rapids, Mich., tells us that the v.h.f. fraternity of Western Michigan will congregate for the same purposes at Allegan County Park on the shores of Lake Michigan, also on July 31st.

W8NOH also writes of an interesting comparison of 2 and 75 in checks made with W9RXS, Milwaukee, Wis. This path of about 120 miles across Lake Michigan shows very satisfactory signals with 100 watts on 144 Mc. On 3.9 Mc., a 400-watt rig has rough going, what with skip effects and heavy QRM.

A 175-mile sked has been kept reliably on 144 Mc. by W9ZHL and W9YRX, near St. Louis, since last October. On only three occasions since that time has communication been difficult on voice, and many other stations in the St. Louis area and Western Illinois have called in also.

Last month we mentioned the appearance of W1DEO, Cape Elizabeth, Maine, on 144 Mc. Herb has been on regularly since, working W1OOP, Needham, Mass., nightly. He is also on 50 Mc., and is working down into Connecticut on that band also, though signals are stronger on the higher band, when conditions are above normal. W1DEO is presently working on 144.12 and 50.7 Mc.

If you were waiting for a shot at Florida, following our recent report that W5VWU was moving there, don't wait any longer. W5AJG writes that he worked W5VWU/mobile, en route back to New Mexico. Leroy reports that the tropospheric season began early this year, in the Gulf States, with W4UUF, Pensacola, Fla., working into Texas on the night of March 11th. The following morning signals were excellent from W5RCI, Marks, and W5JTI, Jackson, Miss., so W5RCI and W5AJG went to 220, for their first contact on that band. The distance is about 370 miles. W5AJG has been running daily skeds on 144 Mc. with W5UXK, Watonga, Okla., 230 miles, for the past three weeks without a miss.

The 220-Mc. band is very much alive in Swarthmore, Ridley Park, Springfield and other towns west of Philadelphia, according to W3TEE. Several stations are on nightly between 2100 and 2200, some having been at it for several years. W3UGA holds the local record with more than 1000 QSOs on 220, and W3KPK is not far behind. All sorts of equipment is in use, including simple modulated oscillators and dipole antennas. Anyone needing help in getting started may get in touch with any of the gang, the more active members being W3s A1IL KPK RWH QMQ QZT TEE UGA UKG YQS.

The Philadelphia area is good round-table territory. A 6-meter group has held forth each Monday night for years, and they frequently join in a similar session held in the Washington area on Sunday mornings. The over-the-air friendships thus formed were brought to a more personal status on March 20th, when a delegation consisting of W2ORA and W3s CGV CUB MXW RQT GGR and WSNRM/3 visited the Washington stations in a body. First stop was W3OJU, District Hts., Md., where W3s YH1 JES UJG WOD and W4CUMF joined the party. Next they converged on W3OTC, Silver Spring, where Bob played them some recordings to show how their signals sound at the southern end of the circuit. The final shack stop was W3KMY, Chevy Chase, where a main attraction was a 5-over-5 array for 50 Mc., soon to be described in QST. The party wound up with dinner at O'Donnell's Restaurant. A return visit to the City of Brotherly Love is now planned.

More Philadelphia area v.h.f. activity: The York Road Radio Club has about 40 crystals on 146.25 Mc. An informal net is conducted each Sunday at 0930 on this frequency, with the club station, W3RDM, as control. A club project recently completed the construction of 14 tunable converters, with 6BQ7 front ends. A companion transmitter is next on the program. Chief engineer for this project is W3NKD. The club is pushing for polarization standardization, to end

the confusion now prevalent within a 100-mile radius, and they want ARRL to assist in this.

For a long time we've been pushing as hard as we know how for horizontal polarization. Conversion to horizontal is well along throughout New England, New York, and Northern New Jersey. In view of the improvement in working range that has resulted, and the excellent results in working the vertically-polarized mobile stations that have shown cross polarization to be no problem in that connection, we feel that there is little reason to continue vertical polarization at any home station. The way to get standardization on horizontal is simply to change over. If any appreciable number do it, the rest will follow.

## OES Notes

*K2BAH, Richmond Hill, N. Y.* — Would like to hear from near-by operators interested in 220 Mc.

*K2DYC, Phelps, N. Y.* — Made several crossband contacts 220-144 Mc. with W2QS, but no activity heard on 220 as yet.

*W3UQJ, York, Penna.* — New 50-Mc. rig with 4D32 in final, and 3-element array nearing completion. New 220-Mc. station, W3AJD. Nightly skeds kept with W3LZD on 220.05 Mc. at 2200, and Sundays at 0900 and 1230.

*W4HHK, Collierville, Tenn.* — Joint 50-Mc. receiver project with W4BAQ. Has crystal-controlled front end that can be switched to either communications receiver tuning 7 to 11 Mc., or to fixed-tuned i.f. for reception of local CD net frequencies. Meteor skeds on 144 Mc. continue with W2UK and W1H1Q, as do scatter skeds with W4PCT and W9WOK. Statewide Tennessee net on 50.5 Mc. in prospect.

*W4UW, Miami, Fla.* — New 6-meter converter completed. Made duplex crossband contacts, 2 to 6, with W4KQG, and with W4ZDR on 11 and 6.

*W5FPB, Albuquerque, N. Mex.* — Reception of unidentified DX signals from the west on 144 and 432 Mc., Feb. 18th, reported by W5DNK and W5FAG.

*W7JRG, Billings, Mont.* — New 6-meter rig and beam ready for the spring DX season.

*W8WKN, Columbus, Ohio* — Work well along on 432-Mc. tripler-amplifier using 6324 tubes. Converter for 432 Mc. modified to tune 8 to 12 Mc., replacing the former tripler-conversion arrangement to 50 Mc. Lots of local activity observed on 144 Mc.

*W8MON, Lawrence, Kansas* — 2-Meter band checked daily on hour and half hour, 0630 to 0800, and evenings beginning at 1930 CST. New 125-watt rig for 50 and 144 Mc. completed. W8KEC and W8ZDB working on 420 Mc.

## W7VMP 144-Mc. May-June Schedule

Experience has shown again and again that 144-Mc. signals can be heard over paths of up to 500 miles consistently, if optimum equipment and techniques are employed at both ends. What lies in between, in the way of mountains, may have very little to do with it, except that when the mountains are at the right point along the path the signal is better than would be the case over flat terrain.

Most of our inability to work over mountains on the v.h.f. bands in the past has been the result of insufficient power, ineffective antennas or poor receivers. With these factors taken care of, v.h.f. men in many locations that once seemed "impossible" are finding that 2-meter DX can be worked. The only real problem, when equipment is taken care of, is the lack of stations to work.

We would have once considered it ridiculous to try 144 Mc. between Phoenix, Ariz., and Los Angeles, for instance, but W7VMP has done it often. Results have also been obtained on schedules with Albuquerque, a mountainous path of about the same length in the opposite direction.

After a rebuilding operation on the exciter, in the interest of improved e.w. stability, The Three Fenwicks are ready for more 144-Mc. DX schedules. Here is what W7VMP will be up to in May and June. All times are in MST. Transmissions will be on c.w., with 1 kilowatt input. Frequency: 144.0165 Mc. Antenna: 32 element horizontal array, 72 feet up. 2000 — transmit east. 2005 — listen east. 2010 — transmit northeast. 2015 — listen northeast. 2020 — transmit north. 2025 — listen north. Other skeds will be made, and kept, upon request.



# TI9MHB

## Or Why a DXer Leaves Home

BY JOHN R. BECK, \* W6MHB

OFF the west coast of Costa Rica lies fabulous Cocos Island, subject of many legends concerning hidden pirate treasure. While eavesdropping on a QSO between KV4AA and W6VBY, I learned that an expedition had been organized to journey to that tiny dot in hope of finding legendary pirate loot. Moreover, the adventurers needed someone to keep them in touch with their families via amateur radio. Being a DX-minded ham, this was a wonderful opportunity to set up as a rare DX station and be part of what promised to be a highly exciting adventure.

Arrangements were made for me to become a member of the expedition and it looked as though I was all set. My XYL, Margaret, said that I would kick myself for the rest of my life if I didn't go, and my employers — the Navy Department — in effect said the same thing.

On January 8th our party sailed from Los Angeles for Costa Rica on the *Isle of Capri*. Operating as W6MHB/mm on 21 Mc., preliminary traffic handling was commenced along with a few conventional QSOs. Many contacts were made despite an S9 noise level from numerous generators, fans, blowers and the like. During our voyage, the ocean was generally smooth except for two storms that lasted five days out of the thirteen we were at sea. Nevertheless, I was unable to operate for only one day; it was just too rough to sit on my camp stool in the radio shack. Also, I had wheel watches from twelve to four — both morning and afternoon — causing operation to be limited to the morning hours during which 21 Mc. was open.

On the second day out of Los Angeles, we received news that Costa Rica was in a state of revolution. Naturally, there was much worry over this, both among the expedition members and stations worked. Roy Colwell, W6LW, undertook to relay news concerning the rebellion. Broadcast reception was anything but dependable.

We arrived at the Costa Rican port of Pun-

taenas on the 21st of January — a very hot and steamy spot. Upon clearance with the Port Captain, we took a jeep to San José, capital of Costa Rica, to have our contract to hunt treasure signed and seek permission for amateur operation while on Cocos. The fact that our treasure-hunting contract with the Costa Rican government clearly stated that there was to be no radio communication, except with government stations on the mainland, definitely complicated matters. Conferences with Tommy Gabbert, TI2TG/K6INI, brought out information that the Radio Club of Costa Rica was greatly interested in having Cocos represented on the DX bands. He said that David L. Maduro, TI2DLM, the guiding light of that organization, would be the man to see for assistance in securing government approval. David was contacted and he and I made trips to see the radio inspector. It was agreed that if no mention was made of the purpose of the expedition, it might be possible to operate as TI9MHB. With the signing of the expedition contracts to hunt treasure on the island, permission was granted.

I was really in high spirits!

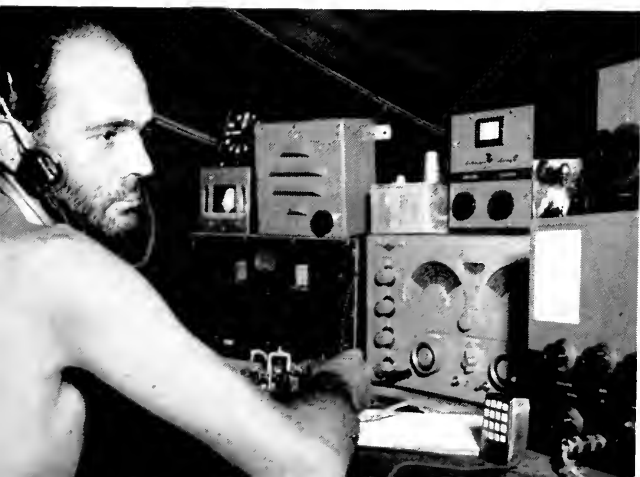
We departed for Cocos with a full crew and all of our equipment. The voyage again was smooth, and at four on the morning of February 7th, we dropped anchor in Chatham Bay. There was work aplenty to be done. Rafts had to be constructed and camping gear and food had to be moved ashore, not to mention setting up ham radio gear. Landings were difficult in the surf and could only be made at low tide as places to beach the small boats often became non-existent. Furthermore, many jagged rocks protrude from the water, making the shore boat-work dangerous as well as difficult.

By sundown on February 9th all of the radio equipment had been unloaded and set up. The generators were serviced and tested and all was ready with the exception of an antenna system. A clear spot extending across the sandy beach looked like an ideal place for installing a long-wire. Don Wallace, W6AM, had previously presented me with

♦

Operating as TI9MHB from Cocos Island, John R. Beck, W6MHB, spent many hours at his operating position to provide a large number of stations with a rare DX contact. Working 15 to 160 meters, 204 contacts were logged at his remote location.

♦



QST for

a good-sized spool of wire which was strung 900 feet to a tree trunk on the far side of the beach. Height: about *ten feet* above high tide!

The transmitter was tuned to 7003 kc. and seemed to perk. Two receivers were in operation, one to monitor my own transmissions and the other to listen to the frequency specified for stations calling.

To test the long ears of the DX fraternity, first transmissions consisted of "DE TI9-MHB," sent once and at intervals. Nothing happened for several minutes. The boys were supposed to be waiting on pins and needles and for a time it was thought that the super long-wire was not so super after all. Finally W1DDF answered; then he of the calloused ears, KV4AA. While a five-minute QSO with Dick was in progress, the boys caught on and the pile-ups were beginning to form.

Our camp's location was excellent for working the United States and Europe. Since most of the island terrain is very steep, the only direction in the clear extended from approximately the Rocky Mountains eastward to North Africa. The effect of the hills was borne out by the fact that all Pacific island signals were quite weak. EL2X was worked, but his fine signal was all but inaudible most of the time.

The reports received while using the long-wire were not too favorable. To correct the situation, a ground plane for 40 meters was put up on the beach area when the tide was low. Rocks weighing up to one hundred pounds were piled to a height of six feet around the base of the supporting poles. The ground wires were tied to some of the larger rocks surrounding it, but the first time the waves roared in they were scattered over the surrounding area. However, the antenna remained erect and it was left that way for the entire period of operation. Later an antenna of the same type was put up for 14 Mc. When the tide was in, water came to within eight inches of the bottom of the radiator and the ground planes were submerged.

Fifteen meters was good while it was "in." Calling stations apparently did not hear each other too well as there was quite a bit of calling out of turn. For 'phone operation, it proved to be the best band because of the lack of commercial QRM and the amount of space available.

Twenty, of course, was the stand-by in the daytime. Usual conditions prevailed except that W6s required openings for loud signals. These occurred in the early morning and just before the band closed for Ws in the late afternoon. During the openings, W6 signals were tremendous



and equaled those from other districts. Normally, most stations heard from W7-land eastward were S9 during the entire daylight period.

Operation on 14 Mc. 'phone was slow because of the large number of strong stations calling simultaneously. Nevertheless, many contacts were made in spite of the QRM.

For the first few evenings Forty was very good but when the pile-ups got down to the weaker stations commercial interference became troublesome.

Eighty provided a big surprise. It seemed to be the best band for all-around contacts and many stations reported our signals strongest on that band. It was found that the long-wire did not function too well on Eighty. Something better had to be erected. Two trees, one in our camp, were found situated about 150 feet apart. A bow and arrow, used by one of the expedition members for hunting, was used to get a piece of light twine over one of the trees. The twine was fastened to an insulator at one end of a 3.5-Mc. doublet and then raised. One of the Costa Rican boys climbed, "Tarzan style," up the vines that hung from the other tree and secured the far end. This new antenna was forty feet high and seemed to perform very effectively.

◆  
The *Isle of Capri* being made ready for the voyage to Cocos Island.  
◆



Many European contacts were made on all bands and I was greatly surprised at the solid signals that were booming in from that part of the world. Many U.S.S.R. stations were heard working each other. In fact, several times during our schedules with W6LW, these stations were much louder than Roy.

A few contacts were also made on 75 'phone, but broadcast harmonics from the Mainland proved troublesome on that band.

I had promised several of the 160-meter gang that I would make an attempt to operate on the "top." So the old long-wire was loaded up and several CQs were sent. Just about the time it was thought that 160 was for the birds, W0NWX, "ye olde Clippertonian," heard my peanut whistle and the first 160-meter QSO with Cocos was in the books. Twenty-one contacts on that band followed. Subsequent reports from England indicated that TI9MHB was heard in Europe by at least one listener. The morning after the 160-meter operation, seaweed was hanging from the long-wire. How the thing worked is beyond me!

An attempt was made to improve the contact format used by previous expedition and contest ops. One gimmick was to end a transmission with the call of the station being worked, the idea

being that everyone calling should know the characteristics of my signal. Also, if there was interference during the first part of my transmission, it might be gone before the end. The fact that very few repeats were requested indicated that the practice paid off.

Another scheme, although not new, was to specify the calling frequency. I had my VFO running at all times so I was unable to listen in on my own frequency. Calls were always requested to be from ten to twenty kc. higher.

On twenty 'phone, especially, the calling frequency system was abandoned because the resulting heterodynes were so fierce that it was impossible to read anyone. The practice of not specifying a listening frequency and continuously tuning over the entire 'phone band was the only logical solution. This jammed up the band fairly effectively for everyone but seemed to be the only way that stations could be copied. Some of the *sharper* (?) operators would make nice long calls after every transmission from me. Naturally, this did nothing to alleviate QRM.

Several hundred messages were handled and the expedition crew and their families were quite pleased with TI9MHB's efforts to maintain efficient communications between them. The DX gang stood by in a most commendable manner during the traffic-handling periods. All traffic for the expedition was handled by W6DFY, W6LW, W0CO and W0ELA.

Who provided the best signals? W4KFC was one of the better from the East Coast; even on 160 he peaked to S9. The Midwest provided the most consistently strong signals. W8DUS was always thundering. From the West Coast, W6YMD stood head and shoulders above all others.

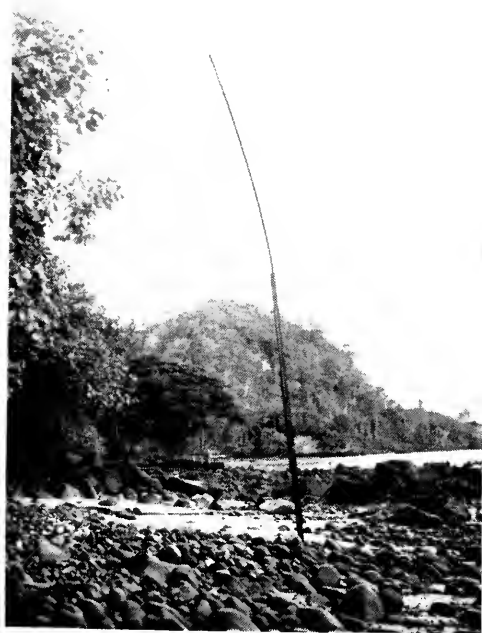
Finally, on February 22nd, the expedition had completed its task. The equipment was loaded aboard the *Isle of Capri* and we sailed for Puntarenas on the evening of the same day. Upon my return to San José, Ted Westlake, TI2BX, and his wife, Virginia, invited me to their beautiful country home. It was there that the process of returning flesh to my bones began (I had lost some fifty pounds during the expedition).

Later, W6LW, W6TT and TI2RU arranged for me to fly home. Arriving at the Oakland airport, I was greeted by W6DIP, W6LW, and Margaret, my ever-faithful wife.

In conclusion, thanks to all who helped make TI9MHB a reality: The Northern California DX Club; the Radio Club of Costa Rica; W6TT and W6DUB of Elmar Electronics who supplied a good portion of the equipment; W6DIP who loaned me a receiver and a generator; and W6KEK who supplied another generator.

The TI hams are certainly a wonderful group and their hospitality and generosity are not easily exceeded. They treated our group royally and we are more than grateful for their help and consideration.

And so now — the end of a wonderful journey. Did I hear someone say, "Where next?" ?



The shore at Chatham Bay is littered with rocks. The larger ones are carved with the names of ships and seafarers who have visited Cocos. Some inscriptions date back over 100 years; almost to the time pirates were active in the area. The expedition also left its share of autographs.

Chief inhabitants of Cocos are hermit crabs, wild pigs, deer, and small lizards; there are also many tropical birds. Fishing is excellent but sharks up to six feet in length infest the waters surrounding the island.

Rising above the rocks on the shore of Chatham Bay stands the ground plane antenna used by TI9MHB for 40-meter operation. The antenna remained erect despite merciless pounding by waves.

# How's DX?

CONDUCTED BY ROD NEWKIRK,\* W9BRD

## How:

When the hounds of spring are on winter's traces . . . goes the first stanza of the Wouff Hong Song, the hallowed club anthem of our beloved DXHPDS (DX Hoggery and Poetry Depreciation Society). We swiped that from Swinburne because we know he referred to DX hounds in particular and because we, too, congregate annually around this time. Yes, indeed, a goodly crowd was there!

It was put up to Great Circles Root to get the show on the road after the first round of Old Haywire began radiating. This he did with a lilt-ing lament to the late QSL file of one bright boy who didn't believe in DXCC's "DX insurance":

"Two-fifty confirmed," claimed O'Squire  
Who dared them to call him a liar,  
"Send in, men? What for?  
I'll wait till I've more!"  
You guessed it: O'Squire had a fire.

Slickrig Toppenbottom followed Circles to the rostrum with a blast directed at schizophrenic DX stations who advocate operating procedures they themselves negate:

This rare one bleats out in great heat:  
"Spread out! Spread out or I'll squeet!"  
So we move for the jerk  
And who does he work?  
The lid who remains zero-beat.

Then Owlbait Ostrowski limned in rhyme the impressive ingenuity of 100,000 McScrees, a bird who tallies his DX score in terms of kilocountries:

"The rules are all wrong!" cried McScrees  
Whose Slobovian card was n.g.,  
So he made his own list  
And there's nothing he missed —  
All stations are countries, you see.

The next ration of ridicule, delivered by Feeders N. Twining, was dedicated to that small pack of watt-mad megacyclic megalomaniacs who erroneously visualize themselves as ham-band Voices of America:

When Two-Gallon Mossbrain dropped dead  
We found nary a tear being shed.  
For Hamdom, no loss —  
Such input made Moss  
Just a bootleg commercial, instead.

W6MUR, the sole out-of-towner to brave the vicissitudes of this year's DXHPDS powwow, then rose to the occasion with a tongue-in-cheek salute to all purveyors of scuttlebutt DXpeditionary sensationalisms:

One rare catch popped up "in Albania,"  
And another "in West Transylvania";  
The grapevine went mad  
But the outcome was sad . . .

\* New Mailing Address: Effective immediately, please mail all reports of DX activity to DX Editor Newkirk's new address: 4128 North Tripp Ave., Chicago 41, Illinois.

You'll have to finish that last one yourselves, gang, for Bill's punch line was drowned out by commotion in the rear of the hall. A flying squad of our sworn adversaries from the Euphemistic Order of DXpurgators barged in and broke up our gathering with tear gas, cherry bombs, and a shower of leaflets labeled, "It's Only a Hobby, Fellows."

## What:

And what a hobby! (They laughed and laughed when little Elmer said he was going up into his attic to chat with the U. S. Undersecretary of State and the King of Nepal. They didn't know that Elmer was a ham.) But that is neither here nor there. Before we tackle our monthly "How's" Bandwagon we should remind you that

In the text to follow, frequencies (given in number of kc, above the lower band-limit) appear in parentheses, times without. E.g., (9) = 14,009 kc. If the paragraph deals with 20-meter work, times are GMT, using the nearest whole-hour figure such as 7 for 0720 or 0650, 0 for 0015 or 2349. As a rule each DX call is mentioned but once per band.

20 c.w. gets us off to a flying start. The swing from winter to summer conditions gives 14 Mc, a capricious turn but W9HIZ swapped salutations with CRs 5JB (45), 7CN (68) 14, EA 91F (88) 21, 0AB (65) 22, FB8BR (68) 18-19, FG7NB (78) 17-18, KT1UX (40) 22, Jan Mayen's LB1LF (21) 14, LZ1KSA (1) 15, a VQ8 and 3VBAB (46) 21 . . . . An FB8, KM6AX and VQ5EK (67) 19 worked W8Y1N. . . . W4AUL met up with ET3GB (8) 20-21, FASCR (10) 19, FY7YE (48-67) 18-20, HK0AI (55-112) 8) 20-21, SV1SP (19) 18-20 and a Rio de Oro EA9. Some time back John retired from the DX racket after reaching 107 confirmed but, "By chance one day I happened to tune over 20 and, brother, that did it — I'm gone, but gone, again!" . . . . W4TFB made away with CR6CJ 20, EA6AF (52) 13-18 of the Balearics, an FY7, GD3UB 12, HA5KBA (75) 16-19, an SV1, 4X4BX (90) 17, 934AB 18 and W4DGW ZD4 22 in Takoradi harbor . . . . K2BZT caught ET3S (62-75) 14-22, F1QV FC (50) 15, GD3s HPN 1BQ (50) 19-20, HA 5KBB (62) 18, 7KLD (70) 18, HE9LAA (62) 19, I1BLF, Trieste (49) 13, JA 3AB 3AF 4BB 6HK, KA 2USA 7DM, SP 3KAU



(30) 15, 5AA (10) 17, 8KAF (62) 16, 9KAS (68) 16, ST2AR, TA3US (50) 13-21, VQ2HR, YO3RF, 4X4BT (82) 19 and 9S4AX (1) 17. Nice haul! . . . . . CR5AF, F08AB (64), MP4QAL (65) 15, OY7ML (5), PJ2BA of Bonaire Isle, PZ1QM (20) 23-0, ZDs 6BX (80) 14 and 8AA (3-60) 18-23 of Ascension chatted with W4QCW of KC4AB fame . . . . . W5UUK put his hooks into CE0AD (20) 2-3 of Easter Isle, CR7AD, an EA0, EA8BF (42) 0, an ET3, HH5SS (25) 0, SPs 3AN 9KAD (60) 14, a VK1 and ZB2A (15-31) 12-20. . . . . CS3AC (55), GC2FZC (35), LZ1KAB (80) and VQ2JN (50) came back to W9IHN . . . . . W3UXX cornered FP8AP (74) 18, FM7WP, EA6AU, EL5B, ILYCG/Trieste, IT1TAI, KG4AO, SP5AA, VP3VN, 5A2TZ and one 3A2AF (10-30) 12-15 who is reported by many other contributors . . . . . ET3LF (38) 20, MP4QAH 17, VSs 6CU 12 and 9GV 17 contacted DL4ZC . . . . . A rundown of results at random shacks, W2GYZ: ZDS, long-path KC6HX (40) of Mays Island, Carolines, W20LU: ZB1JRK (35) 20, W2QBB: CR7AN (26) 21, K2EUN: many Europeans, an EA9 and FP8AP with a 15-watt 6L6 c.c.o. W3AXT: ET3, FP8AQ, FG7, LU6SA of rare La Rioja, W3TFV: FASRJ, TF3NA, YV5s BJ DE, W4PVD: CR71Z 13, OY2Z 9, VQ6LQ 14, W6OWD/L: IIBNU/Trieste, SP6WF, TF3KG (70) 20, YU5 1GC (70) 16, 1GH (10) 18, W6UED: DU7SV (89) 1, JA1CR, KA20J, VPSBD of Grahamland, W8KAK: EA9AP (2-52) 18-19, FY7, KR6LJ for 1st Asian, W0VFM: OX3PW 17, VQ4FM 21, St. Martin's PJ2MA, KL7BBY: CE7ZJ near his antipode, a DU, ship SM8CW in mid-Pacific . . . . . ZD3A (6) 21-22 is a new Gambian reported at W5ASG down Arkansas way . . . . . So, Calif. DX Club's *Bulletin* specifies c.w. 14-megacyclers CE7AA (50) 3, FE8AE, FL8AI (150) 16-17, FR7ZA (19) 16-17, HI8EW (65), MP4QAJ (60) 15, SV0WL (53) 15, one VQ1RY (20) 0, YA2AA (17), YS1O (30) 14-15 and many others . . . . . West Gulf DX Club's *DX Bulletin* fills us in on CE7s BS (35) 1, ZT (82) 40, CN2AD (55) 20, CRs 4AL (20) 11, 6AI (62) 20, 6AR (30) 20, 6BP (110) 22, 6CZ (38) 20, CT3AB (10) 18, EA0AC (8) 5, EL2L (69) 17, F9YP/FC (40) 17, FD8AA (10) 15-18, FF8s AJ (100) 21, AP (50) 13, BB (60) 18, MM (81) 18, FQ8s AK (59-95) 22, AU (89) 20, HB1MX/HE (70) 0-1, HH3DL (13) 22, one HV1ZZ (167) 14, HZ1HZ (15) 16, KR6s KS (8) 1, LF (90) 14, LUs IZV (78) 1, 5ZF (20) 2-3, MB9BJ (30-50) 13-19, MP4BBS (30) 15, OD5LX, SV0WT (30) 13, TF3s AB (17) 0, MB (45) 22, UA3KP (73) 12, UR2KAA (86) 13, VK9OK, VQs 2GW (25) 20, 3FN (89) 21, VR3A (75) 21-0, VS9AS (7) 20, VU2CP (52) 13, ZBs 1LU (34) 18, 2I (12) 21, ZDs 2DCP (30) 20, 4BM (63) 19, 6EF (90) 19-21, ZE3JL (14) 19, ZP3AY (100) 23, ZS3P (64) 18-19, 5As 3TR (57) 15, 4TK (12) 15, 4TO (67) 15 and Netherlands New Guinea's JZ0AG (70) 14-15.

**20** 'phone brooks booming business of late, W4QCW is quite satisfied with the likes of F9YP/FC, GD3IBQ, HI6EC (175), HK0AI (130) 22, KS4AW (180) 22, KT1UX,

PJ2MA, SV0WO, VPs 1OJS 5AE (148) 9, ZB1AJX, ZD3BFC (138) 15 and 3V8BP . . . . . CR6BX (99-113) 23, EL2X (112) 22, GD3ENK (190), ZD4BR (115), ZE2KR (105-120) 0 and 5A1TA (185) set well with W9HUZ . . . . . OD5AB and VP8AO got away from W2GBC but CR6CK, CT2AG, CT3AE, EAs 8AI 8AX 9AR (140), FP8AP, HC8GI (110) 18-19, HH2LR, KA3RR, KT1s LU WX, M1B (100) 0, OE13USA, PJ2AF, TG9MB, VPs 1AB (157) 0, 2DA 2DN 2KM 7NX, VQs 2DT (130) 22-23, 4FQ, YN4CB (120) 14-15, YS1MS, YU1GM, ZBs 1S 2A (105-130) and 5A2CL didn't. . . . . W4CBQ puts his hard-to-remember school French to good use in running down French Colonial 43ers, ET2XX (182), FQ8AD, an FP8, OD5 and SV0 boost Bob to Rung No. 112. . . . . Radio-telephone doings here and there, at K2BZT: VQ4RF (120) 20-21, W3AXT: FG7XB, W5UUK: FM7WN (129), HK0, VQ2, W6UED: HC1ER, TG9 . . . . . CS3AC (190) 14, EAs 8BA (130), 9DF (116) 17, FD8AA (172) 18, FM7s WF (120) 23, WQ (110-150) 23, FQ8AB (290) 12, FY7YE (115) 13, GC6FQ (128) 20, HB1MX/HE (103) 13, HR1CB (150) 14, KC6s AI (202), CG (245), LB1LF (21) of Jan Mayen Isle, VP8AQ (106) 1, VQs 4FK (125) 20, 5EK (150), VR3A (122) 14, VS1FS (142) 14, XZ2ST 14, Y12AM (163) 15, YO3RF (135) 16, ZDs 1DK (135) 20, 4BF (120) 23, 6AH (130) 16, 3V8BL (150-172) 21 and 4X4XD (290) 18 are stalked by WGDXC sleuths . . . . . SCDXC headhunters are after KP6AK (218) 2, OK1MB (185), VK9s RH (143), RM (145), VPs 2DA (130), 2GW (156) 23, VQs 5BVF (183) 22, 8CB (113) 21, VR6AC (352) 1, ZC3AC (293) 0, ZP5CF (130) 16, Marion Island's ZS2MI (105) and 9S4BS (110) . . . . . Newark News Radio Club monitors picked up 14-Mc. radiotelephones CN2AD, CN8s EM IE MM TY 17, CRs 5AC 21, 5NC 6AT 6CB 6CJ, CTs 2AF 3AB, EAs 8BQ 9BC, EL9A, ET2US, FAs 3GZ SCC (195), FB8XX, FF8BB, FL8BC, FQ8s AC AK 22, HKs 3PC 4BD (165), IIBNU/Trieste (215), JA4BB, KAs 2NA 3RR 7BG 7GM 8RK, KC6AB, KGs 4AO 4AP 6FAA, KR6AZ, KV4BB, LX1BU, OQs 5EI 22, 5FM (157) 20, 5GH 6DZ, OH9OC of Lapland, PJ2s CE CH (140), ST2s GB 20, NW, SV8s WK 20, WS, TA3US, TF3MB, TG9AI, VPs 1GG 2VA 7NG 7NN, VQs 2FU 3EZ 4AA 4AQ 21, SAR 20, VSs 4HK 9GV, YAI2T 20, Y12DIQ, YNs 1LB (135), 4DP (135), YU1AD, ZC4AA, ZD2FHW, ZEs 3JY 5J1, ZM6AT 0, ZSs 3E 8I, 3V8AS, 4X4BR, 5As 2TS 2TZ and 3TE (195) 20.

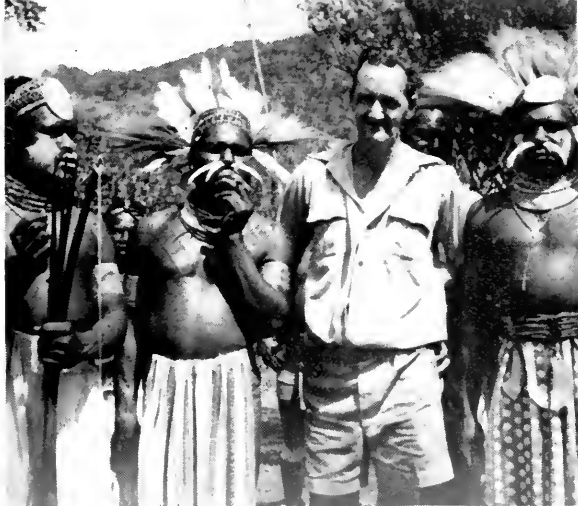
**40** c.w. now is more selective because of roving thunderstorms. For instance, a patch of QRN over New York City may be a big break for Connecticut and southern New Jersey DXers—less competition. Anyway, here's W4TFB's 7-Mc. bag: CR7s CI (5) 5, CN (8) 5, EL2X 7, FAs 8DA 6, 8RJ 7, 9RW 7, KC6CG (10) 11, LU9ZE 8, OQ5RU (12) 5 and YU2HG 6—it's 118/89 for Don and DXCC won't be long now. . . . . EA9AP (25), Biak's JZ0DN (34), LU4ZI (10), OX3AY (3) and a VR1 fattened the swag at W9HUZ . . . . . CE3DZ, DU7SV, HK4s BD (25) 7, DP (45) 0, JAs 1CR 1VE 1VX 4BB 6BO, a JZ0

CN8ML emits a fat Casablanca signal on 14- and 21-Mc. 'phone with Panda and Bendix gear, uses a Collins receiver and a pair of rotary beams. Operator Richard Keel comes from a DX family; a brother and cousin are HB9s PU and P, respectively. When you've worked all three stations you are eligible for the WAK certificate issued by CN8ML—Worked All Keels.



SM5RM of Stockholm can give linguistically-inclined DXers workouts in fluent English, German, French, Spanish, Italian and three Scandinavian languages. Olif runs 150 watts on several DX bands, is building a 500-watt final amplifier, owns a printing business and has been hamming for 30 years. (Photo via W9TRD)

VK9RM recently moved from Lae to Wau, New Guinea, and here he is getting acquainted with his new neighbors. Gainsaying last month's Jeeves episode, Peter reports these local dandies as quite hail fellows well met.



and KC6 contacted W6UED. . . . W5UUK does okay on 40: CR6AI (8) 4, EAs 8BF 9DF (15) 6, FR7ZA, OQ5s CP (6) 4, GU (5) 6, a TI9 and ZS3K were worked. . . . CR7CO, CX6AD, LU9UH of Province Eva Peron (a rare one for RCA's awards) and ZS1HX (22) 5 grace W3AXT's ledger. . . . CN8EB, GC3KAV, HH3DL (48) 6, KG4s AO and AV made the grade with W3WPG who finds 40 hottest between 4 and 6 on the GMT chronometer. . . . W1ORP picked off ZC4XP (37) 22, ZE5JA, 3V8AB and 4X4BR without much difficulty. . . . An EA9, KG4AJ, KV4AA and YU2AE swapped c.w. with WIAPA who finds 7-Mc. c.w. a cinch compared with his usual 40-'phone DX pastime. . . . W4CAY captured JAs 1KM 7BO 9CQ (not two), a JZ0, KC6 and long-haul VK6SA. . . . Now, samples of 40-meter code luck around the circuit, at W2GVZ: HK9AI (39) 4, W2QBB: TF3MB (8) 0, YVIAD (32) 0, K2BZT: IIBNU/Trieste. K2EUN: with 15 watts, KH6IJ, CO8AQ, FAS, OKIAEH, YU1FC 22 answered K2GZN. K2JKA: HC4MK, H113, W3TYW: IIBLF/Trieste, VP4BN, W4QCF: OX3, TI9, ST2AR (10) 2, W5ZAK: OX3BE, K6EBH: DU7, JAGAD, K6EYI: JAs 1CP 3FJ, W7UWS: JA3AB, KL7s AWW FAK, W3YJB: OX3AY, TF3NM, W6VFM: Zss, VPs 6AM 7NM 10, DL4ZC: HK3DM. . . . 40-c.w. candidates DU18S (21) 13-14, EAs 6AF (30) 3, 9AP (50) 6, FM7WD (23) 5, FY8AA (0) 5, HA5KBA (5) 7, JA0WH (12) 13, KD6AT (17) 12, KR6OY (18) 12, KT1UX (40) 2, LU8ZC (10) 5, PJ2s AA (13) 3, AN (6) 3, UA0KKB (21) 13-14, VP8s AU (40) 5, B11 (8) 2, VQs 4AQ (4) 5, 5EL (2) 3-4, 8CB (20) 13, VR2CG (27) 7, YSIO (17) 12-13, YV1EV (5) 3 and YU3CB (7) 3 are specified by WGDNC. . . . SCDXC adds CN8MIG (12), FG7XB (10) 3-4, FF8JK (18) and VQ2HR (15) to this prefix pudding. . . . Novice doings on the 40-meter DX tangent are unheralded but not uncommon. WN3ZKH hooked CO2GU, VP6KL, W4FHI V06 and WP4AAQ, plus 45 states. KN2JKC knocked off CM7JA, CO2BL and DL1FF on 7188 kc. WSRGF 2 heard ZL3GQ calling WN5FQR and other unsuspecting WNs around 7178 kc, at 0830 GMT. Other DX stations appear to get a bang from thrilling the WN/JN 7-Mc. gang so you Novices had better pass up no weak signals!

**40** 'phone DX work attracts but a hardy few. WIAPA has what it takes, and it takes plenty. Gil collected CM2ZZ (193) 13, COs 2NT (186) 12, SLS (210) 14, HH2s JL (194) 12, RM (120) 11, KG4s AG (255) 12, AJ (208) 6, AV (207) 2, KH6s AGB (215) 11, AUB (210) 11, KV4BK (210) 11, PJ2AF (223) 11, PY2AGR (265) 3, TI2GC (194-250) 12-13, TG9VS (206) 11, VPs 10JF (300) 4, 2GW (200), 2LN (120) 12, 4TI (193) 12, 6JR (220) 11, 6KL (192) 12, 9BO (120) 12, 9BL (175) 12 and VK3ATN (100) 12. . . . NNRC ears switched over 7-Mc. voices CTs 1CL 3AE, DU7SV, EAs 8AX 8BQ 9AS, EL2X (65), HH2s 1A PL, H16EC, HK9AI, HP3s FL OJ, HR1JB, JA2CT, KG6GX, KL7BBK, LU's a-plenty, PYs likewise, KJ6FAA, TG9BG (190), VPs 2DN 6FO 6WR 9L, Tasmanian VK7WA, YN4CB (70), ZLs galore and ZSI PM.

**80** c.w. has forty's atmospherics-selectivity in no-trump and times ten. Stronghearts hold fast on 3.5 Mc., however, and doubtless there will be considerable DX worked by the W/K gang right through the hot months. DU7SV (20) 13, EL2X (12) 5-6, GD3UB (6) 0-1, HA5KBA (12) 1, HB1MX/HE (2) 5 and ZD2DCP (6) 6-7 contacted W9HUZ. . . . EA0AE and H18EW (9) carried W4BRB to the 80-meter 117-country mark. . . . W5UUK gassed with an EL2, HK4DP, KL7PI, KM6AX, TI2s BX and PZ. . . . W3AXT concentrated on CTs 1UX 2BO 2, 3AB (18), EA8BP 2, FA9s RW RZ (10) 7, FP8AP, LU2GB, LZ1KAA, OE5JK, PY6FI, VP7NG and ZS2A. . . . Eighty good DX fortune at this shack and that, at W21VS: VP7NX (5) 5, ZB1BF, W2LPV: FA9, KV4AA, OK2DG, K2BZT: FPs, KT1UX, OE2JG, K2HZR: HZ1HZ,

SP9KAD, YU1AD, 9S4AX, W4TFB: FASDA, W6NJU: KR6LJ, XE2OK, H8YTA: KM6 VP7 ZS 984, W9UDK: XE1OE, ZLs 1BY 3GQ, W0VFM: KH4 KH6 KV4, DL4ZC: Ws 21HF 4CDC. . . . WGDNC and SCDXC list 3.5-Mc. radiotelegraphers FF8AR (13), GD3IBQ 0, HK1BD (17) 7, HA5KK 4, JAs 1CJ (5), SAH (18), LASRB 8, LZ1KDP 6, OE3SE 4, PJ2AA 4, PY5EK 3, UA9DH, UB5CF, VK7KM 12, VP8BD 2, YU2AEF and ZB2A 4.

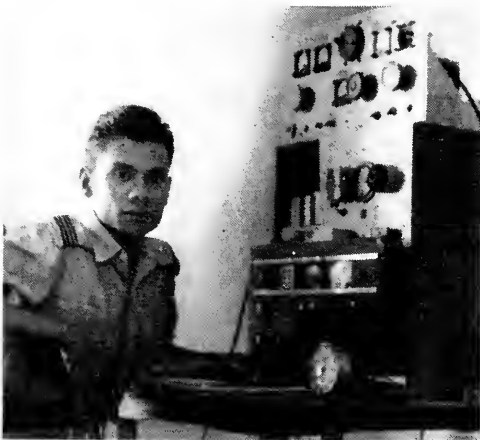
**15** 'phone is the preferred playground of numerous DX chasers these days and W6ZZ confirms the reason why: CE3 3H 6AB, HC1s FK FS, HP3FL, KA's 2KC SRK, KG4AR, KL7s AN BFW BGG CC, KM6AX, KV4BD, VP5AE of Turks, VQ2s DT FC, YV3FL, ZL1s BY 1MQ, ZS6s CV ZO and ZP5IB. Miles also collected ten more MMs on 21-Mc. A3. . . . HK3DP and PJ2AR were new 15-meter countries for W6NJU. . . . W4DOC now has 80 countries on 21 Mc. thanks to CT3AE, FA3OA, H16EC, OQ5RU, YS1RA and others. . . . Still searching for an Asian, W4UWC reached the 72-country mark on fifteen by way of TG9CR, VP3YG, a VQ2, VP8AQ of the So. Orkneys and ZB1AJ; six weeks on 21-Mc. 'phone furnished 67 countries for 10-meter specialist W4NQM. . . . Fifteen-A3 desiderata here and there, at W1HDD: VP1GG, W3TYW: HC1PL, KH6s, W6UED: HC1, KG6GX, OA5G, W6XJU: DU7SV, KA2KC, VKs, ZLs and VR2CG. . . . 21-Mc. 'phones reported by NNRC: CN8CS, CP5EP (220), EA0AC, EL2X, GDs 3ENK 61A, KV4BI, OA5E, OQ5VP 20, PJ2AO, VP8AZ, VQ4AR, YV5BV, ZE2KR 21, sundry ZLs, 3V8BP and 4X4DK.

**15** c.w. got a play, too, and even the Novice gang bestirred their DX bones. WN3ZKH scored with FAs DA RJ, Gs 210 3DCU, GM3GJB and KZ5DM while WN7WS provided Utah for TI9MHB's Novice-band WAS effort. . . . EA6AF (75), IIBLF Trieste (67), KT1UX (10), ZB2A (15) and ZS3K (100) waggled keys with W9HUZ. . . . W3TYW assembled a pile of Europeans while W7VWS consorted with several KH6s, KL7CGA, XE2OK and ZL1BY. . . . ZEs 3JP and 5JJ came back to W5UUK. . . . DL4ZC worked OA4ED, HZ1HZ and a ZS5 without fuss or bother. . . . WGDNC got the fifteen-A1 goods on AP2K, CE3AG (1) 18, CR6AI (33) 18, FAs SCR (20) 16, 9RW (20) 17, FF8AJ (30) 16, FR7ZA (180), FY7YC (75) 20, HK4DP (2) 18, VP7NX (40) 17, VQ2GW (30) 16, ZDs 6BX (50) 17, 9AC, ZS3K (100) 19, 3V8s AP AX BL and BP.

**10** 'phone and c.w. received narcotic shots in their ionospheric arms or else the ARRL DX Test deserves the credit. Anyhow, a few mailbag missives have favorable comments concerning the 28-Mc. range. W6NJU worked A3 with LUs 7BQ 7QB 8FAO, KH6AFS and TI2BX. . . . ZS3E was a welcomed 10-meter customer at WSYIN around 28,320 kc. . . . W1WXC recommends present-day 10-meter work for DXers who like to dig for 'em and reports W1s HJB LSZ ONK QNC UQW and YWU enjoying this strenuous sport. W1WXC ran down CR6BX, CXs 3AA 7BA, HC1MB, KZ5s, KV4BI, LUs 4AAR 4DZI 8AM, TI3LA, VPs 1GG and 2KM on voice.

**160** c.w. activities may be in the post-mortem stage for most participants in the past season's doings but you'd better keep an ear on this band. It's a tricky one!

The North American path fizzled out somewhat to make European pickings slim but several South American folk turned up to enliven recent 1.8-Mc. soires. YV5s DE FH and HK4DP worked a flock of W/K brethren; W1s BB and ZL, in that order, were among the first to nab the Colombian. YV5FH's performance was topped with a smooth W0NWX 'phone QSO. . . . W1BB understands that W2SKE was the only North American to put a consistent



The pile-ups inspired by Burma's XZ2OM are all out of proportion to the mere 25 watts Mike runs to a 3-stage 807 rig on 7-, 14- and 21-Mc. 'phone and c.w. Dipoles radiate on 40 and 20, a ground-plane on 15, and an AR-88 receives. XZ2OM was in there pitching during this year's ARRL DX Test although his reception was hampered by unusually severe KA, KR6 and KG6 interference.

signal into Europe on 160 during the ARRL Test, A3 section. . . . W6KIP/6, strongly abetted by W8GDQ, continues his efforts to work VS6CQ on one-sixty and results to date feature a W6KIP/6-VS6CQ crossband contact on 160-40 meters. The perseverance of W6KIP/6 deserves plaudits inasmuch as he persists in the face of East Coast success with European and African DX, listening to people working stuff he can't quite pull through out his way. It certainly would be some form of poetic justice if W6KIP/6 succeeded in making the grade with VS6CQ. This will be a very fancy 160-meter QSO! . . . . T19MHB's 1.8-Mc. activity boosted the top-band countries totals of Ws 3E1S 9F1M 9PNE and many others. KH61J and KL7TM appeared on the band; KG4AB and XE2OK showed up during the Test to swell the list of near-but-rare 160-meter countries available. . . . We close the Bandwagon on a sad note this month with word of the passing of outstanding 160-meter DX specialist VE1EA. Clarry, along with G5BY and W1BB, pioneered the annual Transatlantic Tests in the years before WW-II. VE1EA, you will recall, scored the first recorded North America-Asia QSO (with HZ1KE) in January of 1951.

## Where:

XZ2OM confirms that all XZ2-bound QSLs can be sent via Box 611 or Box 367, Rangoon, Burma. Mike adds, "I will do my best to [help] any station needing an XZ2 QSL. Full QSO information is required, together with IRCs, and cards will arrive direct." . . . . W2GT emphasizes that FG7XB does not receive QSLs via Box 11, Pointe-a-Pitre. Use this address only: 44 Chemin des Petites Abymes, same town. Antoine, who started out QSLing upon QSO, rapidly is becoming disillusioned with that approach; we have on hand his list of prominent DXers who as yet haven't bothered to answer his cards. . . . As previously noted, a new slate of VK1s is active from Australian outposts on Macquarie and at Mawson Base, Antarctica. In lieu of other addresses they can be QSL'd via W1A. W1OJR reports fast response from VK4FJ on behalf of VK1EG if IRCs are sent. Along this same line, when you seek to do business with other good Samaritans helping out rare DX stations with

QSL problems, by all means cooperate fully by sending self-addressed envelopes plus postage or IRCs where necessary. It's more than enough that such agents contribute time and effort without incurring monetary expense as well. . . . U. S. QSLs for QSOs (over 300) with PJ2MA (PJ2AA) on St. Martin Island can be shipped via W1PST, but all non-U. S. amateurs should QSL direct to PJ2AA. . . . Don't look now but scattered U.S.S.R. QSLs are sliding through QSL bureaus once more. . . . Periodically we caution newcomer DXers to QSL DX stations via foreign radio-society bureaus only when instructed to do so by stations worked, or when so noted in this column. Unlike your ARRL QSL Bureau, which handles cards for ARRL members and nonmembers alike, many overseas societies make their bureau facilities available for members only. QSLs they receive for nonmembers may be returned, pigeonholed or destroyed. So, when you work a flock of stations in Outer Baldonia don't just drop your QSLs into an envelope and ship the lot to the Outer Baldonian Radio Society QSL Bureau. That could be an excellent way to guarantee yourself a rockbottom QSL-returns percentage! Another thing: Unless exception is noted in this column, do not mail foreign-bound QSLs to the ARRL QSL Bureau. Your League bureau is chartered only for the distribution of QSLs incoming from overseas and foreign sources. . . . The accuracy of the individual items to follow is by no means guaranteed, nor are they in any case necessarily "official." Garnered mainly from third-party sources, they are published here in the hope that they may assist someone to a fast QSL or two. W1s APA RDV UED WPO, W2s BBK GT OLU, K2JCS, W4s AUL CBQ QCW TFB, W5UUK, W6ZZ, W8s KAK Y1N, W9s CFT UE TRD, W0VFM, F7ER, EDR, OVSF, NNRC, NCDXC, SCDXC, WGDXC and W1A deserve your gratitude for these:

CM2ZZ, A. Noble, Calle 14, 727 Almendares, Havana, Cuba. . . . CO1AF, A. F. Gonzales, Apartado 38, Artemisa, Cuba. . . . CR6AT, P. O. Box 1454, Luanda, Angola. . . . DU9WX, Box 12, Iligan City, P. I. . . . ET2TV, c/o Kagnew Station, Asmara, Eritrea. . . . FB8BC, Box 587, Tananarive, Madagascar. . . . FB8BP, J. de St. Amand, 143 Avenue Foch, Tananarive, Madagascar. . . . FY7YE (QSL via W4ML). . . . HI6EC (QSL via CM9AA). . . . HK1GO, Box 342, Baranquilla, Colombia. . . . ex-HR1FV, F. H. Vogel, ZP51B, U. S. Embassy, Asuncion, Paraguay. . . . KG4AG, G. Hodges, Navy 115, Box 41, FPO, New York, N. Y. . . . KP4ZW, Box 120, Ramey AFB, Puerto Rico. . . . KP6AK (QSL via KH6OR). . . . KV4BK, P. O. Box 618, Christiansted, V. I. . . . LU2RD, F. Medina, B. Belgrano 553, Catamarca, Argentina. . . . LU3TB, P. F. Altamirano, Ave. 17 de Octubre, 319 I. o. A., San Salvador de Jujuy, Argentina. . . . LU6JF (QSL via RCA). . . . LU9SA, A. Nomicarios, Dest. Aeronautico, Chemical (La Rioja), Argentina. . . . LU9ZE (QSL via LU8FP). . . . ex-MD5SX, R. H. Taylor, G3KAP, 45 Albert Rd., Deal, Kent, England. . . . ex-MF2AG, G3KEI, 1 Hq. Sig. Troop, Wilton Pk., Beaconsfield, Bucks., England. . . . MP4QAL, F. Walshe, Decca Navigator, Shell Oil Co., Dohah, Qatar, Persian Gulf. . . . ex-OX3BA, A. Barsted, Boulevarden 23, Aalborg, Denmark. . . . OX3PW (QSL via EDR). . . . ex-OX3RD, V. Hansen, Baggesen Alle 91, Esbjerg, Denmark. . . . OZ6OJ (QSL via EDR). . . . PJ2BA, P. O. Box 383, Curacao, N.W.I. . . . PJ2MA (QSL to PJ2AA). . . . PZ1QM, P. O. Box 631, Paramaribo, Surinam. . . . SU1AS, Ahmed S. El Gawaherji, Box 2034, Cairo, Egypt. . . . SU1IC, Ibrahim M. Charny, 1 Mohamet Pasha Shukri St., El Agiza, Giza, Egypt. . . . SV0WU, Hq. JUSMAG, APO 206, New York, N. Y. . . . TG9VS, P. O. Box 115, Guatemala City, Guatemala. . . . ex-VK9GW, G. A. Warner, c/o OTC, Bringley, N. S. W., Australia. . . . VK9RM, P. Mongries, Wau, T. N. G. . . . VK9VG, c/o Dept. of Posts and Telegraphs, Lae, T. N. G. . . . VK9VW, G. Stobie, c/o P.O., Port Moresby, P. T. . . . VK9WK, c/o RTC, Madang, T. N. G. . . . VK9XX (QSL via VK3XK). . . . VP2KF, P. O. Box 182, St. Kitts, Leewards, B. W. I. . . . VP2VA, I. Humphries, Tortola, British Virgin Islands, B. W. I. . . . VP3VN, 9 Howes St., Georgetown, British Guiana. . . . ex-VP8AO, J. Lenton, 34 Lynwood Ave., Luton, Bucks., England. . . . VQ4FT, Box 61, Nairobi, Kenya. . . . VSIGN, 1925864 SAC Stone, Singapore Signals Center, RAF Changi, Singapore 17, Malaya. . . . YU1GM, R. W. Thompson, Philco Techrep, c/o U. S. Embassy, Belgrade, Yugoslavia. . . . ex-ZB1DM (QSL to W1RFZ). . . . ZB1JRK (QSL via ZB1E). . . . ex-ZC4FB (QSL via G3ATU). . . .



**ZC6UNJ**, Box 490, Jerusalem via Israel ..... **ZD3A**, Box 285, Bathurst, Gambia ..... **ZD9AC** (QSL via SARL) ..... ex-**ZL1AIO**, B. Bellringer, G3JYF, 14 Green Lane, Redruth, Cornwall, England ..... ex-**ZS1RG** (QSL to G6UT) ..... **3V8BL**, Box 747, Tunis, Tunisia ..... **457YL** (QSL via W5EFC).

## Whence:

**Asia** — From the pen of Asian airman XZ2OM: "Regarding W DX, W6s frequently are heard, but very few W1s and W0s. VE/VOs are so rare I wonder if they are on the air!" Mike lists XZ2s EM KN ST and SY as other currently active Burnese amateurs ..... **HZ1AB** reports a surprising lack of W5 W6 and W7 signals during the ARRL DX Test but other U. S. call areas were breaking through consistently. Ron has trouble loading some of the various antennae he rigs up, for the **HZ1AB** stock of antenna-coupler components is quite limited ..... Japan's International DX League lost its headquarters by fire but pluckily plugs on. **IDXL** issues several DX certificate awards that may be of interest to wallpaper hunters. For information on same write the organization at Box 56, Central P. O., Kyoto ..... An intriguing tidbit from the pages of *Zero-Beat*, organ of the Hampden County (Conn.) Radio Association: "W1YCG hopes to operate from Afghanistan if permission can be obtained. Will be using a Viking Adventurer for both c.w. and 'phone. Start listening around July 1st." ..... **WGDXC** Asiatic gleanings: **G3FQX** heads for a ZC4 session. . . . **V89XZ** has been operated by ex-**SU5XZ**. . . . **MP4BBS** (G8RP) does shipboard hamming off Bahrain island with a BC-610.

**Africa** — After six months at the key of **ZS1RG**, **G6UT** finds 100-plus ARRL DXCC List countries in his log. **OT** St. Johnston now is back in the U. K. picking up where he left off on the **G6UT** DX trail ..... **W7PCZ** was **EL2X**'s 48th state after a year of WAS effort. **EL2X** now has a DX tally close to the 200-country mark ..... **EL5B** (ex-**DL3WH**) finds the fishin' easier with his present call sign, although he did all right in Germany, too ..... There are gratifying signs that Egypt is taking a more tolerant view toward amateur radio. Several official licenses now appear to exist ..... **CNSML**, a Swiss in Morocco, especially likes to rag-chew with W4s because he spent considerable time in Floridian environments ..... Club African comments, *SCDAC*: One **ZD3ES** soon should be available. . . . **FL8AI** often is heard by **EL2X** but no answers result. *WGDXC*: **F8SAE**'s inactivity is the result of illness but **Marcel** still had hopes of doing 100-watt business on several DX bands before leaving the Roons.

**Oceania** — No U. S. amateur yet has collected the **NZART** (New Zealand) **WAZL** award. **G6BS** turned the trick, though, so it is possible. **W0TUB** stands ready to provide information on **WAZL** and all interested North American DXers are invited to apply ..... The scarcity of VK2s in the 1955 ARRL DX Test was caused by serious New South Wales flood conditions, the worst in recent years. Most VK2s on the air at that time were **QRL** pushing emergency traffic on **W1A**'s emergency nets. **VK2W1** was **NCS** on 3525 and 7050 kc. Favorable newspaper publicity resulted from a communications task well done ..... **Pago Pago**'s **KS6AB** is being coaxed back to 20 from his 80-meter hideout by **WGDXC** cohorts.

**Europe** — Yank-in-Yugoslavia **YU1GM** reports bagging his 100th country. "Am not faring so well in the conformation department but have caught up on my own QSLing now and am keeping it current. Those who have not received cards will eventually get them as most went through bureaus. I have worked nearly 2000 W stations and shall be switching to 15 and 10 meters as conditions improve." The **YU1GM** address appearing in this month's "Where" promises faster results than **Bob**'s old via-APO listing ..... **ZB1JRK**, slated to remain in Malta until August, punches out a big 25-watt signal by virtue of a 650-foot long-wire, as noted by **W2OLU**. **ZB1DM** closed station for return to New England. . . . Albanian and Vatican State continue to be the object of *Dxpeditary* intentions by several well-known DXers, but so far not so good ..... Another trophy for diploma-hunters: **W4YUR** (Worked All Yugoslav Republics). **W1UED**, who spotted it, suggests those interested write the sponsoring organization, Savez Radiomatera Jugoslavije, Trg. Republike 3/IV, Belgrade, Yugoslavia ..... **W4CBQ** has it that **SV0WU** shortly will be heard from Rhodes ..... European club diggings,

**NCDXC**: Never lose heart — **W6TT** just received a **QSL** for a 1930 QSO with **SM6SB**. **TT** was **CAZ** in those days. *WGDXC*: Over 1500 **QSLs**, 1000 from W/Ks, have been received by Monaco authorities as a result of phoney 3A2 activity. . . . Write **UBA** (Belgium), Post Box 634, Brussels, for information on their new **WABP** (Worked All Belgian Provinces) DX award. . . . **ZB2s** I M and O are current Gibraltar actives.

**South America** — When you burn up your only plate transformer in British Guiana you go off the air for a while until you (1) get it rewound, or (2) scrounge another. **W0VFM** reports such a revolting development at **VP3VN** who normally runs 40 watts to an 807 on several bands, receiving with an **HQ-120**. No surplus counters or supply houses down Georgetown way ..... **FY7YE** closed in on the 3000-Ws milestone and has developed quite a **QSL** backlog. But thanks to **W4ML** and others, Mario's pasteboard problem rapidly nears solution ..... *WGDXC* sources find that **HC8GI** of the Galapagos, a retired Chicagoan, settled in the islands with an 18-watt Harvey-Wells exhaler, a couple of dipoles and an **XYL**.

**Hereabouts** — **VP1GG**, due for **QRT** shortly, hopes to appear next from **VR2** environs. **W1HDQ** hears he'll be taking a ham-band vacation until around November ..... **VP2VA**, host to **W2BBK**'s recent **FPSAK/VP2** **DNeursion**, is a retired British engineer down British Virgin Islands way. Ivan knows no c.w. but gets great kicks from 20- and 75-meter 'phone operation. **VP2VA**'s home is powered by a battery Windcharger set-up while his ham gear runs off a 1.5-kw. 110-volt generator. . . . **W0BAF** contributes a brilliant color shot of his 100 hard-earned **DXCC** **QSLs** which causes Jeeves to wonder: What is more colorfully impressive than a large display of DX pasteboards? ..... **ADXC** (Alaskan DX Certificate) is a new one issued by the Anchorage Amateur Radio Club, P. O. Box



"Hungarian headquarters station" **HA5KBA** has logged about 3000 **QSOs** since activating in October of last year. Its staff of several operators is hunting for the last few states needed for **WAS** and has worked well over 100 ARRL **DXCC** Countries List items. Chief op "Bandi," **HA5BM**, put this home-built equipment through fast paces during the 21st ARRL DX Competition recently concluded. **QSLs** for **HA5KBA** go via **W3ANT** who provided this photograph.

211, Anchorage, Alaska. Ten **KL7** confirmations, including at least one from each of the following Alaska areas, will do the job: southeastern Alaska (the area bounded by British Columbia), northern Alaska (the area north of the Arctic Circle), Aleutian Alaska (the Islands plus Kodiak), and central Alaska (what's left). Write **AARC** for complete rules ..... **OT** DXer **W4MIR** felt the nip of the DX Bug once more and reports similar awakenings in the shacks of local W4s **AIT** **CS** and **ZH**. **McSwindle** and **W2GVZ** were right! ..... **W1APA** observes that **KG4AG** is operated

(Continued on page 150)



# Operating News



F. E. HANDY, WIBDI, Communications Mgr.  
R. L. WHITE, WIWPO, Asst. Comm. Mgr., C.W.  
PHIL SIMMONS, WIZDP, Communications Asst.

GEORGE HART, WINJM, Natl. Emerg. Coördinator  
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., 'Phone  
LILLIAN M. SALTER, WIZJE, Administrative Aide

**Full Addresses and Proper Check Required on Originations.** Ever find yourself on the delivery end and unable to do the job? All amateurs (and MARS originators too) are asked not to permit amateur traffic to start on its way by radio *unless* it can carry an adequate address to insure delivery. Each handling station should have an understanding about the check or word count before receipting (QSL) for the message! The *newcomer* is urged to study all the concise information in the League's booklet *Operating an Amateur Radio Station* relating to checking, servicing and handling messages. It's part of the tradition of amateurs that they actually can communicate, and in a responsible manner. Both old and new timers may benefit by rereading W3ECP's "Net Know-How" in March *QST*.

But let's hear from Cy Read, W9AA, who takes up this matter with Hq.: "I am still running a full head of steam about the way messages are coming through. Some addresses are 'strictly from hunger.' In this case there was no one nearer, and the NCS asked me to mail it. In due time it came back marked 'unknown' whereupon I sent out a SVC. . . . It appeared that many of the traffic stations located in small towns or at great distances don't seem to realize that any message going into a big city must have a *complete and accurate address*, if it is to get through. Get the boys to understand and insist on a proper address on every message originated, and our service will be improved. Note the check on the original message doesn't agree with the text count. . . ."

The example Cy attached was a MARS origination (Hawaii). The principle of needing more address applies to many a U. S. A. amateur radiogram. Refile procedure is given in detail, page 130, June '53 *QST*. All amateurs should refuse to start messages unless they are complete and in standard ARRL form for amateur circuits. There are more amateur nets functioning effectively to get traffic through than *ever* before. Make texts concise, address complete, with a 'phone number where feasible, and operators *should* check them carefully as to destination. Haphazard and rubber-stamp originations generally impair more than they advance the amateur traffic reputation!

**How to Improve Your "Fist."** Sending at home on a code practice oscillator or buzzer *in step with tape-sent transmissions* is a good way that some are overlooking to improve one's sending. You can note from page 70 in this *QST*, the days when we send practice text from

*QST* if you wish to try this. Experienced amateurs concede it is much easier to copy at high speed than it is to send manually and *well* even at moderate speeds. Interspersed periods of sending practice are worth while, since they buck up the ability on the receiving side too.

Smoothness in sending requires good spacing and rhythm. Newcomers: to avoid having your sending fall into the category where TEST becomes "NST" and CQ becomes "NNQ" bear in mind that by copying tape (automatic) transmissions regularly with some time spent *sending* in step with the tape, such defects can be overcome. Code then becomes most enjoyable and effective for two-way communications.

**Country Considerations.** What makes a country in the ARRL Countries List? Not many DXers think much about this since the standard list for reference is reprinted up-to-date in *each* January *QST*, and put out in folder form. You can mark your countries as you work them, while collecting your 100 cards to submit for DXCC. Watch *DXCC Notes* headings in *QST* for any possible list changes; such are usually additions. "How's DX?" may give you additional facts about the presence or absence of signals or countries, also "where to find" the DX reported, documenting your kind assistance. The ARRL Countries List is a yardstick for DX, the standard for use in connection with the ARRL DX Competition and the DX Century Club. But we started to tell you what's behind the list in terms of country policy.

The League Communications Department is assigned the honor and responsibility for making operator certifications and awards. A standard published list assures uniformity, and one goal for all concerned to work toward, either contestwise or for countries credits. A group of experienced staff-member licensed amateurs assist the Communications Manager in arriving at decisions through discussion and analysis of operating problems requiring administrative review. On countries the "approach to the problem" may, we think, interest you.

There are three criteria on which facts are determined in approaching any countries problem: (1) Does the area have political independence? (2) Does it have adequate geographical separation from a parent nation? (3) Does it have foreign lands in between? Of course, whatever the list permits, it is the *same* for all working to the goal. But the reason respect for our list is general is, we think, because it is progressively kept up to date as governments change; also that

any modifications only follow League inquiry and precedents and consultation with authorities such as our U. S. Department of State, Webster's *Geographical Dictionary*, and Rand McNally.

The ARRL Countries List is the guide in determining what to send us in order to qualify for the ARRL DX Century Club award. It is available to members of the League on request; ask for Operating Aid No. 7.

— F. E. H.

## CODE-PRACTICE STATIONS

The following is an up-to-date list of all stations participating in the ARRL Code-Practice Program:

W1ACT, Fall River ARC, 57 Richmond St., Fall River, Mass.; 3545 kc.; Mon., Wed., Thurs. and Fri., 1900 EST; 5-7 w.p.m.

W1QZO, Harry Warner, 11 Berlin St., Wollaston, Mass.; 146.8 Mc.; Tues. through Sun., 1900 EST; 6-14 w.p.m.

W1SRB, Al Vesce, 84 N. Main St., Thompsonville, Conn.; 29.6 Mc.; Mon., Wed. and Fri., 1930 EST; beginner's speeds.

W2HIEI, William Teso, Mountain Ave., Hillburn, N. Y.; 3950 kc.; Sat. and Sun., 1400 EST; 5-18 w.p.m.

K2IBC, Avenel Radio Club by W2FSL, Adolph E. Elster, 53 Commercial Ave., Avenel, N. J.; 3675 kc.; Sat., Sun. and holidays, 0730 EST; beginner's speeds.

W2NRM, Howard B. Jack, 12 Beech St., Ramsey, N. J.; 29.118 Mc. and 1880 kc.; Mon. through Fri., 0715 EST; 29.118 Mc.; Mon. and Thurs., 2200 EST; 3-8-15 w.p.m.

W3KWH, Steel City Amateur Radio Club, R.D. 5, McMichael Rd., Pittsburgh 5, Pa.; 29.108 Mc.; Wed., 2000 EST; 5-13-25 w.p.m.

W3UYD, Walter C. Downes, R.D. 2, Box 328, Jeannette, Pa.; 3585 kc.; Sun. 0930 EST, Wed. 1830 EST; 5-15 w.p.m.

W3VEJ, James M. Alcorn, 207½ Longfellow St., Vandergrift, Pa.; 7150 kc.; Mon. and Wed., 1900 EST; 5-15 w.p.m.

W4RUR, for St. Petersburg Amateur Radio Club, E. J. Blatt, 538 16th Ave. So., St. Petersburg, Fla.; 28.05 Mc.; Mon. and Wed., 1900 EST; 6-22 w.p.m.

W4ZRII, Carlton R. Commander, 17 Joyce St., Mt. Pleasant, S. C.; 3700 kc.; Mon. through Fri., 1830 EST; 5-13 w.p.m.

W5JRV, for Galveston County Amateur Radio Club, Blanchard Boldman, 4802 Ave. Q½, Galveston, Tex.; 1882 kc.; Mon. and Fri., 1900 CST; 3-15 w.p.m.

W5USN, Dan Baird, W5SPZ, chief-in-charge, 8th Hqtrs. USNR Radio Station, Marconi Drive and Robert E. Lee Blvd., Route 3, New Orleans 24, La.; 7100 kc.; Mon. through Fri., 1230 CST, 15 w.p.m., 7100 and 3750 kc.; Fri. through Mon., 1930 CST, 15 w.p.m.

W6JZ, Ray Cornell, 909 Curtis St., Albany 6, Calif.; 3590 kc.; Mon. Wed. and Fri., 1830 PST, 5-25 w.p.m., 1920 PST, 35-45 w.p.m. (When needed, schedule maintained by W6EFD.)

K6USN, Cmdr. J. M. McCoy, 12th Naval District Reserve Electronics Stn., Bldg. 7, Treasure Island, San Francisco, Calif.; 3590 kc.; Tues. and Thurs., 1830 PST; 5-25 w.p.m.

K7FCV, Lyle B. Clemans, CWO USAF, MARS Base Dir., Davis-Monthan AFB, Tucson, Ariz.; 3825 kc.; Tues., 1830 MST; 8-20 w.p.m.

W7FWID, O. U. Tatso, 513 N. Central, Olympia, Wash.; 3646 kc.; Mon. through Fri., 1700 PST; 4-25 w.p.m.

W8MAI, Blossomland Amateur Radio Assn., c/o WSFGB, Dean Manley, R.F.D. 1, Box 147F, St. Joseph, Mich.; 1890 kc.; Mon. through Fri., 2000 EST; 5-20 w.p.m.

W9KLD, for Kankakee County Radio Club, Don Rockwell, 685 Rutledge Ave., Kankakee, Ill.; 1895 kc.; Mon. through Sun., 1900 CST; beginner's speeds.

W9NPC, for Fox River Radio League, Lewis R. Hill, 212 N. Evanslawn Ave., Aurora, Ill.; 1810 kc.; Mon. through Sat., 1900 CST; 5-20 w.p.m.

W9UIN, Joseph H. Kadlec, 1148 Ashland Ave., Evanston, Ill.; 7240 kc.; Sat. and Sun., 0800 CST; 5-7½ w.p.m.

W0EGQ, Bob McMullin, Route 1, Lehigh, Neb.; 3755 kc.; Mon. through Sun., 1800 CST; 5-13 w.p.m. with text from *The Braille Technical Press*. Same schedule alternated with W0LGG, Bertha V. Willis, 108 N. 19th St., Marshalltown, Iowa, with text from *QST*.

W0LQC, F. Bion McCurry, 1234 Stanford, Springfield, Mo.; 29.18 Mc.; Tues., 2130 CST; beginner's speeds.

W0ONF, for Se Kan Radio Club, Kenneth M. Parker, Box 141, Howard, Kansas; 3805.5 kc.; Mon., Wed. and Sat., 1730 CST; 3½-15 w.p.m.

W0QDF, W. H. DuBord, 10247 Midland, Overland, Mo.; 29.6 Mc.; Mon. and Wed., 2000 CST; Mon. 5-13 w.p.m., Wed. beginner's speeds.

W0SQE, Bill Heitritter, 1114½ Virginia St., Sioux City, Iowa; 3750 kc.; Mon. through Fri., 1600 CST; 5-13 w.p.m.

## FIELD DAY STATISTICS

By Roy T. Harmon, W0IUB

Field Day is the most important event of the year in amateur radio. It started in 1933 and has continued to the present day (except for the war years), and Field Day records should interest many hams. Americans seem to like records as incentives. The four-minute-mile hope kept track fans enthused for many years even though there were no milers around who could come close to it. Following this line of thought, I sat down with my *QST* back issues and figured out the postwar records for Field Day. I used numbers of contacts to determine winners, since multipliers and point systems have changed from time to time.

Some of the feats look almost impossible, while others seem like they could be beaten easily by concerted effort. One fact that surprised me was that so many of the records were set in 1949, 1950 and 1951. One would think that since Field Day popularity has always grown from year to year, all of the records would have been set in 1953 and 1954, but not so! The W6MBA mobile rig sure must be a corker, and W3JTK's outstanding work as single operator at home has stood unchallenged since 1949. And in 1951 eighty-seven ops participated at one club set-up; what a circus that must have been!

Here are the figures. Hope the hams around the country enjoy them.

<i>Simultaneous Transmitters</i>	<i>Most Contacts</i>	<i>Call Used By Club</i>	<i>Year</i>
1	594	W8BDA/8	1951
2	983	W3BES/3	1954
3	1151	W4KFC/4	1951
4	1425	W6PD/6	1951
5	1198	W4FU/4	1949
6	1434	W4FU/8	1953
7	1570	W4FU/8	1954
8	1593	W2GSA/2	1951
9	1911	W2GSA/2	1953
10	2065	W3FRY/3	1953
11	1255	W5SC/5	1954
12	1626	W1OC/1	1953

<i>Class of Competition</i>	<i>Most Contacts</i>	<i>Call</i>	<i>Year</i>
One transmitter (unit or individual), 1 op	301	W6EYH/6	1949
One transmitter (unit or individual), 2 ops	520	W6TSW/6	1953
Two transmitters (unit or individual), 2 ops	535	W6AOA/6	1951
Mobile, 1 op	277	W6MBA/6	1950
Mobile, multi-op	274	W6MBA/6	1951
Home rig on emergency power, 1 op	240	W1T1A	1952
Home rig on emergency power, multi-op	248	W2SZ	1953
Home rig on commercial mains, 1 op	406	W3JTK	1949
Home rig on commercial mains, multi-op	833	W4KFC/4	1954

<i>Year</i>	<i>Number of Participants</i>	<i>Number of Log Entries</i>
1946	1936	187
1947	2702	288
1948	4660	305
1949	4942	495
1950	5935	609
1951	6118	644
1952	6451	522
1953	7007	692
1954	8380	819

*Largest Number of Participants:*

87, Northern N. J. Radio Assn. (1951)

## A.R.R.L. ACTIVITIES CALENDAR

May 7th: CP Qualifying Run — W6OWP  
 May 12th: CP Qualifying Run — WIAW  
 June 3rd: CP Qualifying Run — W6OWP  
 June 11th-12th: V.H.F. QSO Party  
 June 17th: CP Qualifying Run — WIAW  
 June 25th-26th: ARRL Field Day  
 July 2nd: CP Qualifying Run — W6OWP  
 July 11th: CP Qualifying Run — WIAW  
 July 16th-17th: CD QSO Party (c.w.)  
 July 23rd-24th: CD QSO Party (phone)  
 Aug. 5th: CP Qualifying Run — W6OWP  
 Aug. 16th: CP Qualifying Run — WIAW  
 Sept. 3rd: CP Qualifying Run — W6OWP  
 Sept. 14th: CP Qualifying Run — WIAW

## CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from WIAW will be made on May 12th at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,010, 52,000 and 145,600 kc. The next qualifying run from W6OWP only will be transmitted on May 7th at 2100 PDST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions will be made from WIAW each evening at 2130 EDST. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes the order of words in each line of QST text sometimes is reversed.

*Date* Subject of Practice Text from March QST

May 3rd: A Compact Dual Beam . . . p. 11  
 May 6th: Frequency Marker with 60-Kc. Intervals, p. 14  
 May 9th: Overtone Crystals . . . p. 16  
 May 11th: Flexibility in the Antenna Coupler, p. 18  
 May 16th: Low-Noise Receiver Design, p. 20  
 May 19th: The Multimatch Antenna System, p. 22  
 May 24th: The "Hidden Gem," p. 24  
 May 26th: Transmitter Hunting — Seattle Style, p. 25

## BRIEF

An amateur recently wrote the ARRL Communications Department as follows: "Is it possible to obtain a duplicate A-1 Operator Club certificate? Some time ago my wife pitched mine in the alley in a fit of pique. Now my *new* wife might like to see how important the old boy is!" (P. S.: He got the certificate.)

## WIAW SUMMER SCHEDULE

(Effective June 1, 1955)

(All times given are Eastern Daylight Saving Time)

*Operating-Visiting Hours:*

Monday through Friday: 1300-0100 (following day).

Saturday: 1900-0230 (Sunday). Sunday: 1500-2230.

A mimeographed local map showing how to get from main highways (or from H.Q. office) to WIAW will be sent to amateurs advising their intention to visit the station.

*Official ARRL Bulletin Schedule:* Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules. *Frequencies:*

C.w.: 1885, 3555, 7125, 14,100, 21,010, 52,000, 145,600 kc.

'Phone: 1885, 3945, 7255, 14,280, 21,350 kc.; 52, 145.6 Mc.

*Times:*

Sunday through Friday, 2000 by c.w., 2100 by 'phone.

Monday through Saturday, 2330 by 'phone, 2400 by c.w.

*General Operation:* Use the chart below for determining times and frequencies for WIAW general contact with any amateur. Note that since the schedule is organized in EDST, the operation between 0000 and 0100 each day will fall in the evening of the previous day in western time zones.

*Code-Proficiency Program:* Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and at 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday are made on the above-listed frequencies. Code practice starts at 2130 each day. Approximately 10 minutes' practice is given at each speed. On June 17th instead of the regular code practice, WIAW will transmit a certificate qualifying run.

## WIAW OPERATING NOTE

Until June 1st, when the complete WIAW Summer Schedule detailed elsewhere on these pages goes into effect, WIAW will conduct general operation as shown on the chart on page 70, Sept. 1954 QST, *except that EDST instead of EST will be used.* Other operation will follow the pattern set down on page 71, March 1955 QST, also in EDST instead of EST. *Exceptions:* (1) On May 12th, WIAW will transmit a Code-Proficiency Qualifying Run instead of the regular code practice. (2) On May 20th, WIAW will make a special transmission for frequency measurement instead of the regular code practice. (3) WIAW will be closed from 2230 EDST May 29th, until 1500 EDST May 31st, in observance of Memorial Day.

## WIAW GENERAL-CONTACT SCHEDULE

(In Effect June 1, 1955)

WIAW welcomes calls from *any* amateur station. Starting June 1st, WIAW will listen for calls in accordance with the following time-frequency chart.

Time (EDST)	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0000-0100 <sup>1</sup>	.....	.....	3555 <sup>3</sup>	.....	3945	7125 <sup>3</sup>	.....
1300-1400 <sup>2</sup>	.....	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	.....
1500-1600	.....	7125	14,100	7255	14,100	7125	.....
1600-1700	.....	14,280	7125	14,100	14,280	14,100	.....
1800-1900	.....	14,280	14,280	14,280	14,100	7255	.....
1900-1930	.....	7255	.....	21,010	.....	14,280	.....
1930-2000	.....	14,100	.....	3555	.....	14,280	.....
2000-2030 <sup>1</sup>	14,280	3555 <sup>3</sup>	14,100	14,100	7125 <sup>3</sup>	14,100	.....
2030-2100	14,280	3555	14,100	14,100	7125	.....	.....
2100-2130 <sup>1</sup>	145.6 Mc.	21,350	145.6 Mc.	52 Mc.	21,350	.....	.....
2230-2300	.....	.....	1885	.....	1885	.....	.....
2300-2330	.....	.....	3555	.....	3945	.....	.....
2330-2400 <sup>1</sup>	.....	3945	7255	3945	7255	3945	.....

<sup>1</sup> Starting time is approximate. General-contact period on stated frequency begins immediately following transmission of Official Bulletin, on c.w. at 0000 and 2000, on 'phone at 2100 and 2330.

<sup>2</sup> Operation will be on 21,010, 21,350, 28,000 or 29,000 kc., depending on band and other conditions.

<sup>3</sup> WIAW will listen for Novice Class licensees on the Novice portion of this band before looking for other contacts.



Having just finished compiling some figures based on 169 EC annual reports received (10 per cent of all ECs), we thought you might be interested in some of the statistics and estimates derived therefrom. We'll present these in expository fashion, so you won't have to try to interpret from tables.

First of all, let us note the percentage of EC annual reports received — 10 per cent. Not too good, is it? Yes, we know that being an EC has a lot of work connected with it, and to a person not too fond of paper work (and who is?) it seems as though Headquarters or the SEC or someone is constantly badgering ECs for reports. Actually, all we ask is a Form 5 (post-card size) once a month to the SEC and a one-page group of figures once a year. From these, we can glean some well-educated national estimates, since 100 per cent response is unthinkable.

You see, we use these data; we're not just trying to make you work for nothing. Once each month we summarize SEC reports (which are based on your monthly Form 5 reports to the SEC), and once each year we summarize EC annual reports and make estimates of national totals based on this. Naturally, the larger the percentage of reports received, the more accurate our estimates will be. However, based on the 10 per cent received this year, here's about what the AREC looks like nationally.

We have about 40,000 AREC members, of which 75 per cent are full members. Almost 13,000 of these are "signed up in RACES," by which they probably mean they are enrolled in local, regional or state civil defense communications with RACES in mind, whether or not they are RACES-authorized. There are about 780 existing RACES plans within the AREC structure, not all approved by FCDA and FCC as yet. Most AREC members continue to operate on the 28-Mc. band (over 20,000), but 3.5-Mc. e.w., 3.8-Mc. 'phone and 7 Mc. also have strong followings — and of course most of them operate regularly on more than one band. Six and two meters have shown great increase in popularity, however.

The AREC has an estimated 17,000 mobile units in operation. Ten meters is still the most popular band for mobile emergency communication, followed by 80 75 meters, 2 meters and "other" bands, in that order. However, since the 1953 year end, the greatest percentage increase in mobile emergency operation has been on two meters. The increase on ten meters has been slight.

Nearly all estimates are up from last year, an indication that amateur interest in emergency work is still on the increase, probably a result of the impact of civil defense. Our estimates show a decline in the number of fixed stations having emergency power available, and declines in the number of AREC members using 80 e.w., 75 'phone and two meters (although mobile operation on 2 shows a large increase).

Interesting? We thought so, and encouraging, too. How accurate are these estimates? Just exactly as accurate as a 10 per cent response in reporting will allow.

Fellows, how about putting dates on the emergencies, drills and tests you tell us about? We had reports on four different emergencies lined up this month that had to be

◆  
This is the Queens County RACES Control Center in New York, in action during the RACES-AREC drill held on February 14. On the left, standing, is Bob Link, W2VKF, RACES Radio Supervisor for the city, and ARRL Emergency Coördinator, explaining the setup to Ben Hamilton, W6VFT, visiting RO and EC from San Diego, Calif.  
◆

shelved because there was no hint as to when the emergency occurred. The date of a blizzard, tornado, fire or other memorable local occurrence might be well known to you, but chances are we never heard about it — so date your emergencies, will ya, huh?

— . . . —  
W5ZU calls our attention to an emergency operation which occurred last year that never got written up, except in his SCM column. We think it should be recorded in this column. It seems that last October 6th, 7th, 8th they had quite a flood in the Roswell-Dexter-Hagerman-Artesia-Carlsbad region of New Mexico when seven inches of rainfall within 48 hours sent the Hondo and Pecos Rivers on a rampage. Roswell amateurs W5s BZA BZB QKG TBP WPA YFN YUM YWU ZM ZU gathered on 3838 kc. while mobiles W5s BZA BZB WPA YUM visited the flood area and relayed reports. Once the situation was "eased," a few stations stayed on hand all night while the rest got some sleep. During the night, W5WPA participated in the rescue of a truck and workers at the Hondo Dam, west of Roswell. At 0630 on the 7th, W5ZU fired up as control station with W5s ARD CXC EFT PSP UTS QKA RNG YAS ZGG AIQ FAB PGJ RZS TDB UP in the net, in addition to those on the previous night. Emergency work conducted included: (1) Assistance to Southern Union Gas Company in coordinating work on an eight-inch gas main crossing the Felix River north of Hagerman (mobiles W5s CXC BZA BZB WPA, and fixed stations W5s AK YAS PSP). (2) An emergency call for boats to be furnished by the National Guard was coordinated by W5s BZA CXC and AK, and later rescue of a man on an overturned boat was coordinated by W5s AK ARD CXC. (3) Communications for radio station KSVP, which had to leave the air; CAA was notified that tower lights were off (W5PSP and W5ZU). (4) Reports on flood conditions were relayed up and down the valley. (5) W5UP stood by at National Guard Headquarters in Roswell to link units in Dexter and Hagerman areas. (6) W5BZA BZB mobile encountered extremely high water between Dexter and Roswell; as a result, the road was closed to traffic. (7) Railroad tracks were washed out near Dexter, W5BZB reporting same to the Santa Fe Railroad office. (8) Because of the loss of life and number of missing persons, many welfare messages were handled in the 3838-ke. network.  
— W5ZU, SCM New Mexico

— . . . —  
On January 14th, an Air Force C-45 ran out of fuel 20 miles northwest of Austin, Texas. Upon hearing the engines quit as the plane passed overhead, W5YYM contacted W5TFY in Austin and set the Austin Emergency Net in operation on 29.2 Mc. A few 'phone calls indicated the authorities knew the plane was down, but had no idea where. W5YYM soon located the airplane on a ranch about



a mile from the nearest road. Doctors and ambulances were ordered and the CAA, Texas Department of Public Safety and Sheriff's department were notified. Mobiles W5s KNM PRO QZJ left immediately for Lake Travis to aid in the search for a crew member who bailed out and was missing. For the first 30 minutes YYM/m was the sole means of communications between the scene of the crash and the state police and other authorities. Much traffic was handled concerning directions to the scene of the crash, medical aid, etc. The missing crewman was found by a ranch hand so all mobile units except YYM returned to Austin by 2030. The net closed down at 2115. Mobile units participating were W5s FXN EHD QZJ PRO. W5TFY was NCS. — W5TFY.

Amateurs in Paterson, N. J., assisted police in solving some mysterious crimes during 1954. EC W2ESW was contacted by the civil defense director, at the request of police, and 21 amateurs set up a net on two meters, with a



Three amateurs who assisted the Illinois Central Railroad during the ice storm last December received citations from the railroad on March 2nd. Shown holding their medals are, left to right, W9PQS, W9KXN and W9PEK. W9KRH was also cited.

control station at police headquarters in charge of KN2CYZ. Each car was assigned a "beat" in the neighborhood where the assailant was known to be operating. The patrol started at 0100 and continued until 0530. This continued for four months, but no further attacks were made. However, on October 14th at 0347 one of the cars (W2ZOE with KN2JCR) reported a suspicious character on one of the streets in the area, and he was picked up by police. His retention resulted in eventual arrest and the solving of a number of previously-unsolved robberies. This continuing patrol in cooperation with Paterson police was conducted by the following amateurs: W2s ESW GQD ZOE NEZ GLO MIU NPT ESC KXR FLQ WBY EHM, K2s CMB GYH CVR EIZ, KN2s JCR IPF IEY IDH CYZ. Thanks to Mr. Arthur Donnelly, a Paterson *Morning Call* police reporter, for this report.

Members of the American Legion Amateur Radio Net and the Lancaster, Calif., AREC and Civil Defense collaborated in assisting search operations for a crashed jet plane on January 13th. Search was conducted from 1900 to 0500 the next day using the 10 meter e.d. frequency, but distances proved too great and the search was reorganized using 75 meters. Here the situation was just the opposite, with long skip making multiple relays necessary. W6EJU's portable emergency trailer was set up as control station, with one relay via W6OLG, W6EJU, K6ARY and K6FCZ operated the control station. Amateurs were responsible for finding the pilot's body and unopened parachute, first reports of this coming from W6PIQ. W6WJF says that training in traffic handling showed up clearly in all operations. Other amateurs reported to have participated in this emergency include K6s IHW DBH GZZ AJN BNS and W6GRO.

Reportwise, we started the new year with a bang, as 17 SECs submitted monthly reports, representing 3878

AREC members. This beats January of 1954 and 1953 both in reports and coverage, and also ties January of 1953 in reports, so we're off to a flying start. Let's keep those reports coming in! Initial reporting sections: Minn., Wash., Maritime, Tenn., W. N. Y., W. Fla., N. Y. C.-L. I., Ga., Ky., E. Fla., Ala., East Bay, San Joaquin Valley, La., Wis., Colo., Ont. Thanks, fellows, for your support. Now how about you other 56 SECs?

## RACES News

A good many RACES organizers have written us for "the latest dope on RACES," or information on how to organize RACES. These are pretty general requests, and they usually get pretty general answers. Just in case you are contemplating asking us the same sort of questions, here are some answers:

1) There is a brief buildown on how to organize RACES in our booklet "Emergency Communications," distributed free of charge to all AREC members. If you'd like a copy, just ask for it.

2) The complete RACES regulations are included in any recent edition of *The Radio Amateur's License Manual*, available from ARRL for fifty cents. Or, if you're interested only in the RACES regulations, your best bet is to write to the Superintendent of Documents, Government Printing Office, Washington, and ask for Part 12, FCC Regulations, Rules Governing the Amateur Service. It'll cost you twenty cents a copy.

3) Three articles on the subject of RACES were written in 1953, and most of the information therein still applies. In any event, it's good background. Read "The Radio Amateur Civil Emergency Service" in three parts, in March, April and May 1953 *QST*. Other articles on RACES have appeared in 1953 *QSTs* for Jan., Feb., July, Sept., and 1954 *QSTs* for Feb., Apr., July, Aug., Sept., Nov., and Dec.

4) If you have any specific questions or problems, write and tell us about them. We'll try to help you.

FCCA now will approve for matching funds civil defense equipment installed in private cars *provided* title remains with the state or political subdivision. So if you've been held up in getting that mobile rig installed for civil defense because you think you can't get matching funds for installation in private cars, now you can go to it. Reference is FCCA Memorandum COMM-2.

Speaking of matching funds, there still seems to be some confusion regarding the term "FCCA approval" as it applies to RACES equipment. Such approval has to do *only* with matching funds, and admittedly the FCCA specs are high. If your civil defense people want to pay the whole price (and this is invariably considerably less than you would have to pay for gear that does meet FCCA specs), *any* type of amateur equipment is permissible, provided it complies with FCC regulations.

What's new in your RACES outfit? Got any hot ideas you'd like to share with the rest of the amateur world? How about gimmicks for recruiting, training, getting results in drills, building gear, etc.? Come on, you RACES enthusiasts, *give!*

## NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C. W.	'PHONE
3550 14,050	3875 14,225
7100 21,050	7250 21,400
28,100	29,640

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated *immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. — 3535, 7050 14,060; 'phone — 3765, 14,160, 28,250 kc.

## TRAFFIC TOPICS

Someone reminded us that we have never printed a picture of our BPL Traffic Medallion, authorized by the Board of Directors at its 1954 meeting. Most of you traffic men (and gals) who have been working so hard to get this award don't even know what it looks like. So here it is, about twice actual size. Purty, ain't it?



How do you get it? Well, it's easy — all you have to do is to make BPL three times since June 1, 1954. After your third BPL is printed in *QST*, we send you a little card that says you handled all that traffic by yourself, at your own station, on amateur frequencies, in standard ARRL form. You sign this card, send it back to us, and we send you the medallion.

You only get one medallion, so take care of it. We're not going to send you one for each three times you make the BPL. Wear it on your watch chain, or as a necklace ornament, and wear it proudly at club meetings, conventions, or other amateur gatherings. It's a mark of distinction, like a Phi Beta Kappa key.

Miscellaneous net reports: (1) The Early Bird Net traffic count for February was 782. (2) The Transcontinental Relay Net had 28 sessions, traffic total of 1230, participation by seven stations. (3) The North Texas-Oklahoma Section Net had 28 sessions, 923 check-ins, 333 messages handled. (4) The First Call Area of the Transcontinental Phone Net registered 674 message counts with 14 stations participating. (5) The College Net met 8 times, was attended by 56 different stations, handled 13 messages.

**National Traffic System.** We have just completed compilation of some NTS 1954 statistics, which might be of interest. NTS nets reported 9642 sessions in 1954, handled 106,904 messages. We received 285 reports altogether, about half of them reports of section nets, the rest regional and area. About 25 per cent of the reported NTS traffic total for the year was reported by section nets. Kudos to the managers of 1RN, 4RN, 8RN, EAN and CAN for a 100 per cent reporting job during 1954. RN6, 9RN, TEN, TRN and PAN also reported every month, but data on the report were incomplete or not properly executed through misunderstanding. This makes ten of the 14 NTS nets at regional and area level turning in reports every month during 1954. A very wonderful reporting record, gang. We dream of 1955 and a perfect record. Yes, we said "dream."

The Tenth Regional Net handled by far the greatest amount of traffic (21,972) during the year, with 9RN second with less than half as much (7822). Much of this traffic, in both cases, was "through" traffic not ordinarily handled at regional level, although 9RN returned to a strictly regional function with its separation from TLJ in April. Among the remaining regional nets, RN6 was high with 4501, followed closely by RN5 with 3874 and 4RN with 3765. The three area nets were very close, with PAN tops at 9506, followed by EAN with 8109 and CAN at 7715.

All in all, a very good NTS year, showing a continued increase in interest and activity. Of course we can't show an increase forever, but we think still more progress can be made before we reach a peak. Let each NTS net endeavor to do its share to account for an even better showing in the year 1955.

## February reports:

Net	Ses- sions	Traffic	Rate	Aver- age	Repre- sentation
1RN	24	300	0.51	12.5	91%
2RN	48	275	0.65	5.7	100
4RN	21	155	0.31	7.4	38
RN5	44	640	0.93	14.5	61
RN7	45	148		3.3	37
8RN	37	259		7	85
TRN	35	131	0.59	3.8	82
EAN	21	728	0.95	30.3	97
CAN	20	788	1.01	39.4	98
PAN	21	853	1.01	35.6	100
Sections*	549	3713			
TCC Central		360			
Summary	871	8350	PAN	9.6	2RN
Record	871	10,670		19.1	PAN

## Late reports:

TEN (Jan.)	68	1886	27.7	63%
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\* Section nets reported: NLI (N.Y.C.-L.I.); QKN, QKS & QKS-SS (Kans.); NEB (Nebr.); CN & MCN (Conn.); TLCN (Iowa); AENB & AENP (Ala.); MON (Mo.); WVN (W.Va.); Tenn. Regular & Tenn. Early; NTX (No. Tex.); KYN (Ky.); Minn. Sect. & Minn. Phone; WSN (Wash.); QMN (Mich.).

At the time this copy was being written, reports were missing from 3RN, RN6, 9RN, TEN and two TCC directors — just after we got through bragging above about the reporting record for 1954. No doubt some of them will be coming through late, and whether or not we can get them into the copy remains to be seen. NCSS can help their net managers to report on time by reporting their session figures to him promptly. Depend on your report not making *QST* unless received here by the fifteenth of the month, even though we can sometimes squeeze it in late; because sometimes we can't.

W1BVR is proud of the fine work being done by his 1RN gang. All section nets reported 100 per cent in 2RN. Negotiations are about completed for a new 3RN manager. Representation on 1RN is needed from C. Z. and West Indies; any help from down there? RN5 net certificates have been issued to W5GVS and W4UHA. RN7 still needs



A few of the Minn. Section Net gang got together in W0KJZ's shack for the above snap-shot. That's Lydia, W0KJZ, in front, while gathered about her from left to right are W0DQL (TEN Manager), W0CGK, W0OMC and W0TKX. Lydia is manager of the Minn. Junior Net.

representation from Saskatchewan and Alaska, both zero for February; several other sections have been spotty, mostly represented by only one or two stations. W8DSX has designated W8JWX assistant 8RN manager for West Virginia. We should be able to announce new managers for 3RN, RN6 and PAN in the near future.

TCC news: W6QPY got himself married and has dropped out of TCC temporarily. W6PKL 0 and VE7QC have combined to take over his many functions. W0BDR, W0SCA and W9UJL are performing all the functions in Central Area TCC. Some "night owls" are needed for a late-hour (0930 EST) function in Eastern Area TCC, on Monday, Wednesday, and Saturday; contact W8UPB.



## SECOND ANNIVERSARY RADIOTELETYPE SS

The RTTY Society of Southern California announces final results of the RTTY SS, held the week end of February 20th. Ninety-four stations in thirty-two ARRL sections were reported active, with W2BDI (S.N.J.), W8ZM (Mich.) and W3PYW (Md.-Del.-D. C.) turning in the top scores. The following tabulation lists call, score and number of sections worked:

W2BDI.....	2800-24	W5HZF.....	520-13
W8ZM.....	2600-20	W9ZBK.....	515-12
W3PYW.....	2520-24	W6OWP.....	456-
W8BL.....	2318-19	W7CO.....	405-15
W6CG.....	2080-20	W8IJV.....	396-11
W6AEE.....	2000-20	W1RBF.....	370-10
W9BP.....	1840-23	W3UWM.....	360-12
W7LPM.....	1780-20	W1AW.....	341-11
W9TCJ.....	1760-20	KL7CK.....	270- 9
W3MID.....	1722-21	W6JUE.....	270- 8
W6MTH.....	1566-18	W6ZBV.....	145-
W8GRL.....	1134-14	W5MYI.....	144-
W6IZJ.....	1030-15	W9LDH.....	64-
W6LDF.....	1062-18	W6OGG.....	40- 4
W2TKO.....	1020-15	VE3ZL.....	32- 4
W7PQJ.....	800-16	W4ZPZ.....	18-
W6ZNU.....	728-14	W7CGA.....	16- 2
W1FGL.....	720-12	W6OLC.....	16- 2
W3KYR.....	715-13	W9QM.....	8- 2
W3LMC.....	636-12	W9QBH.....	6- 2
W1BGW.....	546-13	W5ENH.....	2- 1
W1BDI.....	533-13	W2SKK.....	2- 1
W7NVY.....	531- 9		

Besides the the stations whose scores are reported above, the following are known to have taken part: W2s JAV PAT PAU PTW, W3CRO, W5BFX, W6s BNB CMQ DOU EGZ EV FLW KMT MZO NCO NPB NWM PNW SCQ VIH, K6s BTH BWJ, W7s LU PVF, W8s BYB DVL HP KFA LLL, W9s AKM BGC DRW DW GRW GVN JBH LLX NRC SPT UAU VOK, VE2ATC.

## SUPPLEMENT TO NET DIRECTORY

The following list of nets will supplement and correct the listings on page 78, Nov. 1954 *QST*; page 74, January *QST*; and page 75, March *QST*. This list brings the record up to date as of March 18, 1955, and may be used to correct the cross-indexed master multilithed net directory.

An asterisk (\*) indicates correction from previous listing in November, January or March *QST*. This is the final *QST* net supplement prior to fall reregistration of all nets.

Name of Net	Freq.	Time	Days
Ala. Emerg. Net (Phone)	3955	1800 CST	Daily
(AENP)*		0800 CST	Sun.
Birmingham Emerg. Net	29,560	1300 CST	Sun.
(AENR)		1900 CST	Thu.
Chattahoochee Valley Emerg. Net	3910	1330 CST	Sun.
Erie Co. (N. Y.) Civil Defense Amateur Radio Net	50,600	1930 EST	1/3 Thu.
	53,580		
	145,200		
	145,320		
	145,440		
	147,000		
	147,120		
Gadsden (Ala.) Emerg. Net	29,560	1900 CST	Wed.
GAS Emerg. Net (Fla.)	29,000	1930 EST	1/15 ea mo.
Huntsville (Ala.) Emerg. Net	3825	1400 CST	Sun.
Kalamazoo Amateur Radio Club Emerg. Ten-Meter Net	29,600	2000 EST	Wed.
Kankakee Co. (Ill.) C.D. Net	145,800	1900 CST	Tue., Thu.
Kansas Novice Net (KQN)	3735	1400 CST	Sun.
Key West Emerg. Phone Net	29,080	1930 EST	Wed.
Mobile Amateur Radio Club Net (Ind.)*	29,493	1930 CST	Mon., Wed., Fri.
Mohawk Hudson Training Net	3716	1300 EST	Sat.
N. Y. Slow-Speed Traffic Net (NYSS)*	3595	1730 EST	Mon.-Sat.
Newfoundland Net	3750	1900 NST	Daily
North East Texas Emerg. Phone Net	3970	0800 CST	Sun.
Northland Net (Que.)*	3675	1900 EST	Mon.
	3755	1915 EST	Wed.

Nutley (N. J.) Radio Club	29,400	1230 EST	Sun.
*Phone Net			
Palmetto Net (Fla.)*	3675	1830 EST	Mon.-Sat.
The Prep. School Net*	3895	1400 EST	Wed.
Slow-Speed Net (SSN)	3695	0930 EST	Sun.
South La. Emerg. AREC Net	3830	0830 CST	Sun.
South Texas Emerg. Net (c.w.)	3780	1930 CST	Mon.
Teenage Net (TAN)*	3630	1815 EST	Daily
Teen-Ager's Net (TAN)	3815	1600 PST	Mon.-Fri.
Texas Novice Traffic Net	7191	1900 CST	Tue.
Tropical Phone Net* (TPTN)	3945	1730 EST	Daily
Upper Peninsula Net (Mich.)	3930	1000 EST	Sun.
Wash. Amateur Radio Traffic System (WARTS)	3970	1800 PST	Mon.-Sat.

## BRIEF

On June 3, 4 and 5, K2ITG/2 plans operation from the Adirondack Council Camporee, Meacham Lake, N. Y. Command equipment will be operated from a gas-powered supply using 75 meters and other bands.

## BRASS POUNDERS LEAGUE

Winners of BPL Certificates for February traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3WITQ.....	68	860	789	49	1766
W9BDR.....	16	725	701	17	1459
W3CBL.....	73	697	531	155	1456
W9JUI.....	19	680	635	70	1404
W0SCA.....	25	607	593	0	1225
W4PL.....	4	600	568	24	1196
W6SWP.....	58	528	460	65	1111
W9D.....	23	512	486	49	1070
W0CP.....	7	513	473	40	1033
W2KEB.....	35	515	246	141	937
W4PGY.....	10	444	430	10	894
W7PGY.....	24	431	402	29	886
K5FFB.....	102	333	389	46	870
W7BA.....	13	407	396	9	825
W4YIP.....	3	513	175	125	816
W9NZZ.....	227	260	1	258	746
W7FRU.....	3	362	306	56	727
W4TFE.....	1	339	339	0	679
W8GBF.....	28	19	287	308	642
W2KFV.....	16	360	190	70	636
W5MYN.....	12	313	264	42	629
W6YDK.....	25	298	260	38	621
W4COU.....	12	298	281	11	602
K2BJS.....	22	285	269	25	601
W6BSD.....	11	294	280	14	599
W4IYT.....	8	289	278	10	585
W8S.....	7	289	225	61	582
W2RUF.....	22	311	172	63	568
W7VAZ.....	5	279	267	12	563
W40GG.....	16	250	270	15	551
W3WV.....	19	285	199	36	539
W7APF.....	7	263	262	1	533
W4PJU.....	8	259	219	40	526
W9T.....	3	245	203	0	521
W6YHM.....	10	255	224	31	520
W4HKK.....	2	257	245	12	516
K2CQP.....	35	240	217	15	507
W2LPJ.....	11	240	223	28	502
Late Reports:					
K6PCZ (Jan.).....	25	460	440	20	945
W4PJU (Nov.).....	12	256	153	103	524

## More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6IAB.....	46	1642	1524	138	3350
K4FDY.....	15	712	418	13	1158
KA2GE.....	116	383	309	74	882
K6WAY.....	52	395	401	10	858
K6WBB.....	12	403	370	36	821
KA2AK.....	100	306	280	26	612
K4WAR.....	96	305	284	21	706
K9FCA.....	92	219	358	13	682
K6FDG.....	208	157	82	75	522
Late Report:					
KATLJ.....	523	251	149	102	1025

BPL for 100 or more originations-plus deliveries:

W4CFH.....	180	W0LJW.....	125	K4FET.....	111
W4HJD.....	180	W1UKO.....	123	W0KQD.....	105
W4KKW.....	175	W7MWR.....	117	W9AA.....	104
K4WBG.....	148	W8DAE.....	116	W4UHA.....	103
KA2ZH.....	139	W3RV.....	111		

## More-Than-One-Operator Stations

W4SKH/4.....	101	K3WBJ.....	100
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BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W8ARO, W0NIY.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCMA a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies, within 48 hours of receipt, in standard ARRL form.

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

## ATLANTIC DIVISION

**EASTERN PENNSYLVANIA**—SCM, W. H. Wiand, W3BIP—SEC: IGW, RM: AXA, PAM: PYF, E. Pa. Nets: 3610, 3850 kc. The West Philadelphia RA held its annual Dinner Party Feb. 22nd. The club wishes to thank DVB, OWK, and WN3ZIA for a very fine banquet. The York Road RC, now 105 members strong, meets on the 1st and 3rd Tue. of each month in Elkins Park at 8:15 p.m. Visitors are invited. The club station, RDM, is net control for its 2-meter net in session every Sun. evening at 9:30 p.m. on 146.25 Mc. All hams in the Philadelphia Area are invited to check in. YAL reports the club is all set for Field Day. JNQ, NNV, and VOI are newly-appointed OOs, while ZSH is now OES. TYW has a new ground plane working on 15 meters and ZFL is building a beam for the same band. AZZ, ex-KGIII, now on his way back to Germany, is looking forward to a D1.1 call. KAG is back on the air moving to a new QTH. VVV/WUE, an XYL/OM combination, currently active on the PFN, is sporting a new Viking KW. We're pleased to report QGI is back on the air after six weeks in the hospital. OZY is looking for more traffic. UOE is up to 43 countries on 80 meters using his 807's but still needs Asia to make WAC on that band. DUI raises a good question. Are we going to have another picnic this year? Let's plan for it now and announce the date and place in this column. NNV reports his two sons, WNs 3AQI and AQM, are soon to be transferred to Kelly AFB. EAN keeps in touch with his Dad in Miami Beach on 20 and 40 meters. ZBD is a newcomer to the traffic business and the only c.w. outlet for Reading in many a year. The EPA Net welcomes your presence. OM, ABT reports better luck in hearing DX since tuning the receiving antenna. The most recent Novice station to report is WN3BFM. Welcome. OM. Traffic: (Feb.) W3CUL 1456, OK 124, TEJ 91, WUF 66, DUI 65, VVV 58, GFS 56, OZY 55, MWL 50, UOE 38, BFF 31, PYF 27, ELI 20, QIZ 17, PUY 7, PYP 7, ZBD 6, JNQ 5, ADE 2. (Jan.) W3MWL 39, ABT 2.

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA**—SCM, Arthur W. Plummer, W3EQK—On a recent Sat. at 6:30 p.m. approximately 150 members of the Amalgamated Association of Ozone Sniffers gathered at the famous Olney Inn between Washington and Baltimore where they were nobly entertained with masterful demonstrations of metaphysics and mendacity by DWD. A very interesting informal talk was given by George Sterling, 3DF/1AE, who also presented Haraden Pratt, ex-SKH, with the only certificate of its kind for being the oldest ham in or out of captivity. It seems that he started his hobby of spark-gapping the ozone way back in Sept. 1905. Information from several W4s present is to the effect that the Roanoke Division Convention will be held Aug. 12-13-14 at the Chamberlain Hotel at Old Point Comfort, Va. For information contact 4HV or 4NV. RVL reports the Radiation Lab. Radio Club, ZIB, had two transmitters in operation at Parkton, Md., during the V.H.F. Sweepstakes. The Club also sponsored a transmitter hunt Jan. 20th which was won by QLP, with VLL right on his heels. Eighteen stations out of 59 checking into the MEPN for January received the rating as toppers. NNX is now Deputy Chief of RACES in Baltimore under SKK, who is Chief RACES Officer. HTB is the new District Radio Officer Northeast District, replacing NNX. NKX is the new Southern District RACES Coordinator and QER takes his place as new Southern District RACES Officer. Other new appointments are YYB Northern District Deputy Radio Officer, KWX as Northwestern District Deputy RO, and UOJ for the Southwestern. CVS and YJB are active in the net at Northern. ZAR has received an appointment to the Air Academy. EMZ has been appointed RO for Northwestern Dist. ZNH has his General Class ticket. MAZ's XYL, Nina, is studying for her ham ticket. RKK has left Northern and is now attached to Main Control. John Bagliani, owner of Radio Electric Supply Co. in Baltimore,

and well known to everyone in electronics, was operated on during the latter part of February in Mercy Hospital but is coming along very nicely. EQK has a new Hammarlund HQ-140X. GBB is moving from Baltimore City to Anne Arundel County. The Delaware Amateur Radio Club of Wilmington now meets the 2nd Wed. of each month in the meeting room of the Grace Methodist Church. At the February meeting the DARC heard a talk on transistors by a Bell Telephone Company representative. TGF is rearranging his station and expects to be much more active. EQK received a TPA certificate from the Radio Club of Argentina for having worked the 21 Pan-American Countries and Canada. He needs only a QSO with a British Colony station in Asia to get the WBE certificate. MZK has completed a cubical quad for 20-meter c.w. Ron also is sporting his OTC certificate. CDQ is teaching code like mad these days and is very active on 40 meters. HKS hopes to be on soon with a new rig. QCB reports he recently made a killing on some nice equipment. LMC recently was guest speaker at the Aero Amateur Radio Club. KLYA was named chairman of the Club TVI committee. WN3YZJ has completed ten-element "Brownie" beam for 2 meters and is on nightly with a Gonset Communicator. YQJ skeds UJG regularly on 220 Mc. along with 4UMF and signals are from S4 to S9 with seldom a miss. YQJ is using an 822A into 16 horizontal elements. Traffic: (Feb.) W3WV 539, K3WEJ 376, W3UE 274, PKC 171, RV 155, ONB 121, PQ 107, IIC 26, EQK 9. (Jan.) W3COK 90, MCG 76, ONB 63.

**SOUTHERN NEW JERSEY**—SCM, Herbert C. Brooks, K2BG—PAM: ZI. New appointments: K2EDL as OO and YRW as OBS. EGP and EWN has reactivated the South Jersey 2-meter Net at 1900 Tues. on 145.4 Mc. UKS, Ocean City, expects to be "chief" aboard the SS *North America* on the Lakes this summer. Look for Bill on all bands 20 meters and below. We are indebted to K2CEE, Pleasantville, for the Southern Counties Amateur Radio Society news. The SCARA meets the 2nd Mon. of each month at the Pleasantville City Hall. CGP is active on 20 meters with a new three-element beam. Art has worked 109 countries. AQP is on 2 and 75 meters. K2KAA, K2JIO, and K2EQC are giving 160 meters a round. HIB has just returned from a 6-month trip in and around the Mediterranean. The SCARA runs two nets, Sun. at 10:30 a.m. on 3975 kc. and Mon. at 8 p.m. on 1815 kc. The Club is planning more activities in c.d. The DYRA WAS Contest is going strong with many participants. LSS and K2BDD, both on 40-meter c.w., are working good DX. HIA is heard regularly on 40 meters. ZNO has moved to a new QTH so operation is temporarily suspended. K2INQ has dropped the "N." FB. Peggy, The Burlington County Radio Club is holding weekly drills Fri. nights on 2 and 10 meters. KN2JWZ, Lawrenceville, is interested in starting a Novice net. Drop him a line for particulars. ADA is on the mend after a recent operation. LYL has a new rig on 10 meters. Again we urge that emergency gear be kept in good repair and be given periodic checks. Traffic: W2RG 127, ZI 30 ASG 16, K2BG 10, W2SUG 10, YRW 8.

**WESTERN NEW YORK**—SCM, Edward G. Graf, W2SJY—Asst. SCM: Jeanne Walker, 2BTB. SEC: UTH/FRL. RM: RUF. PAMS: GSS and NAI. NYS meets on 3615 kc. at 6:30 p.m. and 3925 kc. at 7 p.m.; NYSS on 3595 kc. at 8 p.m.; NYS C.D. on 3509.5 and 3993 kc. at 9 a.m. Sun.; TCPN 2nd Call Area on 3970 kc. at 7 p.m.; SRPN on 3970 kc. at 10 a.m.; ISN on 3980 kc. at 3 p.m. New officers of Lockport ARC are K2EGD, pres.; TPE, vice-pres.; A. Retzlaff, secy. JFN, treas. The meeting topic was Show and Tell. Those bringing gadgets and telling about them were FEB, ZOC, RXM, YLT, JFN, RUI, ALR, CWB, and K2s GKM, ALB, and ELS. DVD's XYL is K2GHF, Niagara RC officers are LCP, pres.; CMV, vice-pres.; VESIM, secy.; RVJ, treas. Net certificates have been issued to COB, ZZG, BKC, MZ, PKG, and K2s APV and CIG. A new club has been formed in Watertown with ZYD, pres.; K2DUO, vice-pres.; K2GWN, secy.; and KN2JDE, treas., which meets the 2nd/4th Thurs. at 7 p.m. in Jefferson County c.d. rooms in Thompson Park. FE and QQ are active OOs. BLO, EZP, and PZF are on 2 meters. K2HXC received General Class license. K2GVF dropped the "N." VMV is on with an 813. FJN runs 150 watts into a Zepp on 75 meters. K2HLY now is General Class on all bands running 35 watts. KN2HJC and his 10-year-old son, KN2HJD, are boning up for the General Class exam. QWA, on 75 meters, purchased a surplus Collins 30-J and is modifying it for ham use. TQ finds 15-meter DX good. UNC has 813 final running 300 watts. ETW is on with a B&W. DUZ is on 20-meter 'phone. GSX uses an Elmac for fixed and mobile. OZY has been appointed RO for Clinton County. Corning QRM states

the first group of walkie-talkies has been completed. The Club conducts code classes. KEL is catching up on DX on 20 meters after OBS work. CXM is running propagation tests with SZ, IYC, AEE, and others on 160, 80, 75, and 2 meters. FDI had help putting up a 20-meter beam. K2GVN is coordinator of the Tri-State Net on 3687 kc. at 0700 daily, with IZHO and K2EPQ assisting. OPD has resigned as manager of NYSS and K2DYB has taken over. EMW is running 200 watts to an 813. All amateurs interested in forming a club in Clinton County, please contact K2HJC. KN2LBL is a new Novice in Morrisonville. QBB received his WAS certificate and is on 20-meter c.w. since swapping his BC-312 for an HQ-129X. The KBT held an auction. New officers of Elmira Area are K2DPX, pres.; SHE, vice-pres.; WZF, secy.; KN2HNB, treas. K2BUI is putting c.d. modifications to a Viking II. K2DOZ and PPR have new HQ-140 receivers. K2GOK, of Olean, now in the Air Force with the call KR6PR, would like to hook up with Statelike pals on 20 meters, phone or c.w. K2DYC reports that K2DXE worked France in the Novice band. K2s DOI and DAO are on 220 Mc. KN2s KIR, KTE, KTF, and LAD are graduates of Auburn Area code classes. K2GVS is chairman of AARA Field Day. K2GVJ has a B&W. RARA has passed the 200 mark in membership. OWF has an 829B on 6 meters. The RARA v.h.f. group met at the home of ZS. The RARA is compiling a club directory for members. PCN and UTH reported some new countries in the DX Contest. UTH and SJV were guests of KBT president UHI. IHDQ and UHI have a sked on 144 Mc. Sat. at 8 A.M. and would like some activity after the sked. AIC is back from Korea and in college in Wisconsin. Traffic: (Feb.) W2RUT 538, OE 126, YGW 102, HKA 96, ZRC 89, K2DJN 89, DSR 58, W2DSS 43, CXM 38, K2DQ 33, CCQ 11, W2FEB 10, RQF 10, K2AIH 4, (Jan.) W2CXM 62, K2AMZ 16, W2WS 8.

**WESTERN PENNSYLVANIA**—SCM, R. M. Heck, W3NCD—SEC: GEG, RMs: NUG, CHN, GEG, and NRE, PAMs: AER and LNE. The W. Pa. Traffic Net, which meets on 3585 kc. at 7 P.M. Mon. through Fri., reports 248 attendance and 144 messages handled during February. TMA has taken a job with CBS-Hytron and will be moving to Danvers, Mass., so has resigned as president of the Bucktail Amateur Radio Club of Emporium. RVS is running a c.d. net for Cameron County on 29,460 kc., 146,820 kc. and 6 meters if necessary. IYC is working the YLRL nets. HXN, RMX, RJM, and NGZ are building equipment. RLH occasionally joins the 29,080-ke. Com-muters Net. LEH and ZHM are working 220 Mc. WH is n.f.m. on 40 meters. VEE is busy with school activities. VEF is working the club station. PTU is on 80, 75, 40, and 10 meters. OLB has moved to Elmira. N. Y. OG5 is back working part time. ZKY passed the General Class exam. NMJ is working 19X and traffic. The South Hills Brass Pounders and Modulators Monitor editorial staff, LDB, VKS, QOQ, ZSP, and TFC, get out the SHBPM news. ZDK received his new ticket on his birthday. OKU is trying s.s.b. NYG is operating from a new QTH. KPO is mobile on 10 meters. New calls are W3AWC and W3AYB. The Radio Assn. of Erie reports gains in the membership. STK is giving weekly code classes. TNM has joined the Lake Erie Emergency Net. MS is working DX. NXX is putting on a shortwave demonstration at Vernondale High School. New calls are W3 BHJ, BBO, BFB, AQC, and ZQS. From Steel City ARC, NKM is giving s.s.b. a try-out along with MTP. JSS is reported transferred to Boston. W3ANX is on 40 meters. TZW donated the Club a 300-watt c.w. rig. CUM, who has drawn the job of reporting the news from the Butler County Amateur Radio Assn., describes the build-up of an active Butler County C.D. Net with 12 operators checking in each Thurs. at 7 P.M. on 29.6 Mc. LXQ is reported doing a fine job working as liaison between W. Pa. C.W. Net and the Pa. Phone Net (PFN 3550 kc. 1830 EST Mon. through Fri., PYF manager). LMM is proud of his new A-1 Operators Club certificate. Traffic: W3WUQ 1766, LMM 158, QUG 126, LXQ 120, NRE 90, KUN 60, CHN 57, NUG 47, SJJ 34, OEZ 25, KNQ 15, UTX 11, NCD 7, PWN 3, NMJ 1.

## CENTRAL DIVISION

**ILLINOIS**—SCM, George T. Schreiber, W9YIX—Section Nets: ILN (3515 kc.) IEN (3940 kc.) RMs: BUK and MRQ. PAM: UQT. SEC: HOA. Asst. SEC: VTL. Cook County EC: HPG. It has been announced that the annual Starved Rock Radio Club's now justly famous hamfest will be held June 5th, same place. OO renews the month: KA, ICF, JMG, and PHE. ORS: WES, BPC, UCM, OIN, MRQ, JMG, and KJ. OPS: ACU, PHE, and ICF. Making BPL this month are AA, who now becomes eligible for the traffic medallion, DO, and K9FCA. A new Novice is OIH, 11 years old, who has adopted the slogan "Old Intelligent Ham." BUK revived the Illinois C.W. Net paper, *Illinois NUZ*, and got out an interesting issue. CZB lost four power transformers in a damp basement but stays on the air through RGU, the c.d. station at Rockford. HUX says he has moved so many times he can reassemble his transmitter blindfolded. He likes his new VFO. The Society of Radio Operators provided a demonstration of amateur radio for the Lions Club, with ZNY on the air from the meeting place. UVM/0 now is chief

operator of KARL, the student-owned broadcast station at Carleton College. CSW had plenty of rig trouble, but has the 30K running again and is sparking the North-Central Phone Net as NC's four mornings a week. PNK and K9FCA spell him two days. The Net meets at 0700 CST with 15 states checking in. DO made the public prints, as did MRW, with laudatory newspaper stories. New kw. rigs are sported by KJ and BUK. JMG built a modulator for his 30-watt job. When someone calls for Ruth, at GVO, he might be asking for the OM, whose last name is Ruth, or the XYI, whose first name is spelled that way. ING has returned from Mexico, where he operated NE1XE. INF travels so much he is tickled when he can get back to Chicago to attend the Hamfesters Club. AA is playing with a new trick keying relay and prevents BC1 and TV1, maybe he'll write about it. Organizers of the Kankakee RACES 2-meter Net are KLD, HKA, NKR, and QDK. Again TAL warned of interference to Loran by 160-meter stations off-frequency and PBI checked 15 Novice harmonics near 7500 kc. Watch out, fellows! Congrats to WVR and his XYI on their new daughter. NBB has moved to Champaign, and PK to Michigan. SKR spends his spare time dreaming up antenna couplers and building low-pass filters. Freepot amateurs have organized a club, as yet unnamed, but with the following officers: ECS, HAF, CHU, GUY, and RQY. PPM and ZMJ are on the air with new portable 6-meter rigs. They also run a code class and graduated Novices OEZ, OOG, MPN, OFP, and OOC. ZSN's new QTH is Washington, Ill. HPJ and EVA bought Russian code teletypewriters and are busy converting them to send English characters. AVJ gets good results with a pair of phased verticals on 80 meters. SEF writes he is almost blind now, but has a good chance of recovering. TQL took two days of vacation for the DX Contest and broke down the first hour. NN visited a ham club and heard himself roasted for stealing the rare ones before he identified himself. JCX received General Class license and manages to get on the air daily. HYK celebrated his 80th birthday and still keeps a regular sked with his son, DPY. Traffic: W9DO 1070, K9FCA 682, W9IDA 411, AA 281, SAE 153, QOG 106, YIX 54, MFX 53, BUK 52, MRQ 45, VHD 40, BRD 26, STZ 25, LNJ 20, FKP 15, WVR 7, KLD 5, PHE 5, CNF 4.

**INDIANA**—SCM, George H. Graue, W9BKJ—The LCARC concluded its year of activity by holding its second annual banquet with more than 200 in attendance. The NERC has new club headquarters in the City Hall Building. The FWRC held its annual auction. The mobile group demonstrated at a father-son church banquet on how amateur radio can serve civil defense. The MARC (Madison) is planning its 3rd annual hamfest in May, the exact date to be announced later. The TARS reports 35 members certified to RACES. DGA, UHC, AIN, and FJ1 mobilized to Princeton to visit URQ, TKK, ZRR, and N9JEP. DQJ has a new Gonset Communicator. SWN and ZPP are f.m. on 117.3 Mc. UMS is out for DX with a kw., likewise BBC. ZHJ has a new Viking Ranger. SVL had a nice write-up in the Perfect Circle Corp. news organ. Wheel Static held a transmitter hunt with NAR the winner and MYI a close second. DRJ became a proud grandpappy recently. QZC wants a sked for test on 220 Mc. January total traffic on QIN was 612. February total was 476, as reported by OLN net manager. YIP, net manager for RFN, reports a total of 233. WWT, net manager for RFN, reports 125. EHZ reports 113 for CAEN. Those making BPL in February were JUJ, NZZ, and TT. JCJ is keeping 11 schedules daily. NZZ received the coveted A-1 Operator certificate. TT has a new Signal Generator. WWT has applied for OBS appointment. New NCs on QIN are WRO and SKP. IMO is building 220-Mc. rig for 64-element beam. KPL has a new Collins transmitter and receiver. CRP is convalescing after a long illness. EAU has a three-element beam on 14 Mc. AQB expects to be an OPS soon. SVL has a new HT-9, also new mobile rig. CC is recovering from a hernia operation. PPS is operating at YB. NH has worked 20 countries and has been heard in 5 others on 160-meter c.w. NTR received a 1-kw. rig as a gift. Traffic: W9JLJ 1404, NZZ 746, TT 521, WWT 263, WRO 297, TG 182, STC 160, OZO 156, EHZ 150, TQC 136, UOP 132, BKJ 88, QYC 88, ZYK 69, CTF 63, WUH 48, FGX 46, VNY 40, AQB 35, NTA 34, POA 33, YIP 33, CEA 26, SVL 26, CMT 24, ZRP 23, DOK 22, EHE 22, CC 21, YB 18, QR 17, EQO 12, SKP 11, DZC 8, KDVS 6, GDL 7, BDP 5, ZIB 4, FSA 3, NH 3, PPS 3, YVS 2, DKR 1, GDL 1.

**WISCONSIN**—SCM, Reno W. Goetsch, W9RQM—SEC: OVO. PAMs: ESJ and GMV. RMs: IX, RTP, and UNJ. Nets: BEN, 3950 kc., 6 P.M. daily; WIN, 3685 kc., 6 P.M. daily; WPN, 3950 kc., 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile and c.d. frequency: 29,620 kc. New calls in Waukesha are W9NMA, NOP, and ONH. DIK has a new Matchbox antenna coupler. IUU is planning on the Field Day use of the new 750-watt gas generator. SDR picked up 3 new countries during the first week end of the C.W. DX Test. RKP has 15 countries on 3.5 Mc. Because of the proximity of RTTY and the resultant QRMI, WIN shifted its frequency from 3625 to 3685 kc., effective March 15th. WPN had 30 sessions in January with 801 QNI and 138 messages handled, according to SAA. KNK is the proud owner of a new Johnson Viking II

(Continued on page 82)

**L**ISTENING on almost any amateur band one is likely to get the impression that a new type of r.f. amplifying system has recently been developed. This "new" system eliminates all T.V.I., all spurious and harmonic radiations, has high efficiency, has low efficiency, uses only special tubes, can use any tubes, etc., etc. Thus, it is evident that some degree of confusion exists and it seems appropriate to again review some of the clear-cut facts about linear amplifiers.

**T**HEY are not new at radio frequencies as they have been used for years by commercial services. All amplifiers have some degree of distortion thus developing harmonics and inter-modulation products. A linear by its nature will have less of these unwanted products, but good operating and engineering practice make mandatory a carefully designed, tuned tank circuit or pi-network output to reduce spurious radiations to a minimum level.

**T**HE efficiency of a linear amplifier is lower than a Class C stage when rated on a plate power input basis, but when used for S.S.B. and properly rated and measured can provide about 65% plate efficiency.

**A**LMOST any tubes can be used as linear amplifiers. Some, however, will have higher internal losses than others, but would also exhibit these same characteristics when used in Class C applications.

**A** CONVENIENT measure for evaluating linear amplifiers on a cost basis, for a given plate input, is to compare the combined replacement cost of the r.f. and rectifier tubes. For 500 watts input and Class B operation the most economical combination is a pair of 811-A's and 866-A's for a total cost of slightly more than \$14.00. The associated circuit simplicity for this combination also assures increased reliability and further economies. The dollars thus conserved can be spent for the most efficient r.f. input and output circuits to reduce drive requirements and obtain the maximum suppression of spurious signals.

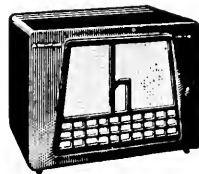
**A**LL of these features, and more, are in the new HT-31 amplifier soon to be announced.

Fritz Franke

*Buell Halligan, Jr.*

*W. J. Halligan W9AC*

for **hallicrafters**



# NOW a BROAD-BAND\* LINEAR

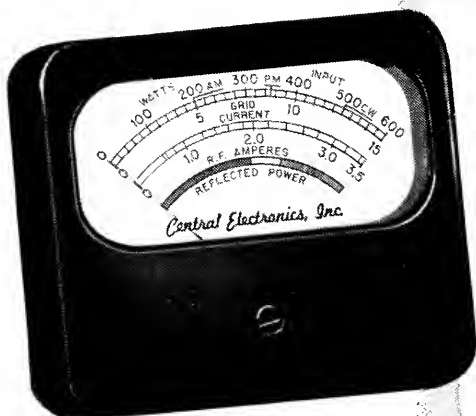
MULTIPHASE  
**600 L**  
NO TUNING  
CONTROLS

SINGLE KNOB  
BAND-SWITCHING  
10-160

FOR USE ON  
SSB, AM, PM & CW



WIRED, WITH TUBES AND  
BUILT-IN POWER SUPPLY **\$349.50**



## Another C.E. First!

METER FEATURES NEVER BEFORE  
FOUND IN A TRANSMITTER

- Reads power input directly in watts
- Reads grid current
- Instantly reads output in RF amperes — no lagging thermocouple
- Indicates reflected power caused by mismatched load
- Calibrated input levels for AM, PM and CW.  
... and switch the meter to any position while transmitting!

\*PATENT PENDING

**WRITE FOR LITERATURE**

## a new concept in linears

CENTRAL ELECTRONICS takes pride in presenting a product of intensive research — the new Multiphase 600L Broad-Band\* Linear. "It is destined to change the entire concept of RF amplifier design in the military, commercial and amateur fields." There are no tuning controls, servos or moving parts other than band-switch.

- Single 813 in Class AB<sub>2</sub>.
- New band-pass couplers provide high linear efficiency: 60 to 65%.
- Designed for 50 — 70 ohm co-axial input and output.
- Easy to drive — Approx. 2 watts effective or 4 watts peak drive power required for 500 watts DC input.
- Built-in power supply — bias and screen regulation, 45 mfd. oil filled paper output capacitor. Excellent static and dynamic regulation.
- Extremely low intermodulation distortion.
- Automatic relay protects 813 and RF couplers.
- Excellent stability — complete freedom from parasitics.
- Effectively TVI suppressed — RF compartments thoroughly shielded and Hypassed.
- Choice of grey table model, grey or black wrinkle finish rack model.
- Table model cabinet size — 17 $\frac{1}{8}$ " W, 8 $\frac{3}{4}$ " H, 13" D.

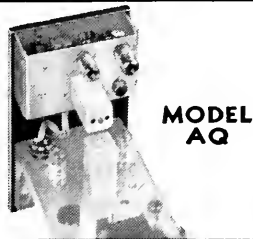
MULTIPHASE  
  
EQUIPMENT

*Central Electronics, Inc.*

1247 W. Belmont Ave.

Chicago 13, Illinois

Watch for early announcement of other new equipment.  
**CENTRAL ELECTRONICS**



**MODEL AQ**



**MODEL DQ**



**MODEL B SLICER**

## NEW MULTIPHASE "Q" MULTIPLIER AVAILABLE THREE WAYS

1. It's built-in the new Model B Sideband Slicer.
2. Plug it into your present Model A Slicer.
3. Attractive Desk Model, for installation directly into receiver.

The new Multiphase "Q" MULTIPLIER is a tunable IF electronic filter that provides tremendous receiver selectivity for peaking or rejecting a signal on AM, CW or SSB. It employs a new two tube circuit\* with a special very high "Q" pot core inductor. Continuously variable selectivity from 60 cps to normal IF pass-band. Nulls out interfering heterodynes without affecting speech intelligibility. Peak the desired signal; interfering carriers are attenuated up to 50 db.

\*PATENT PENDING

### MODELS MODEL AQ

"Q" MULTIPLIER for installation in Model A Slicer. Includes new front panel. Power-IF cable plugs into accessory socket.

Wired... \$29.50 Kit... \$22.50

### MODEL DQ

Desk Model "Q" MULTIPLIER for use with any receiver having 450 to 500 KC IF. In attractive case 5 1/4" W, 4" H, 5" D, with connecting power-IF cable. Power requirements, 225 to 300 VDC at 12 ma., 6.3 V at .6 amps, can be secured from receiver. Can provide added selectivity and BFO for mobile SSB or CW reception.

Wired... \$29.50 Kit... \$22.50

### MODEL B

Sideband Slicer, same as Model A Slicer but includes built-in "Q" MULTIPLIER. AP-1 not needed.

Wired... \$99.50  
Kit... \$69.50

### Check These Features NOW IN BOTH MODELS

- **Perfected Voice-Controlled Break-in** on SSB, AM, PM.
- **Upper or Lower Sideband** at the flip of a switch.
- **New Carrier Level Control.** Insert any amount of carrier without disturbing carrier suppression adjustments.
- **New Calibrate Circuit.** Simply talk yourself exactly on frequency as you set your VFO. Calibrate signal level adjustable from zero to full output.
- **New AF Input Jack.** For oscillator or phone patch.
- **CW Break-in Operation.**
- **New Gold Contact Voice Control Relay.** Extra contacts for muting receiver, operating relays, etc.
- **Accessory Power Socket.** Furnishes blocking bias for linear amplifier and voltage for optional VFO (Modified BC458 makes an excellent multiband VFO.)
- **40 DB or More Suppression** of unwanted sideband.

### SIDE BAND SLICER

#### MODEL A IMPROVES ANY RECEIVER



Upper or lower sideband reception of SSB, AM, PM and CW at the flip of a switch. Cuts ORM in half. Exalted carrier method eliminates distortion caused by selective fading. Easily connected into any receiver having 450-500 KC IF. Built-in power supply. Reduces or eliminates interference from 15 KC TV receiver sweep harmonics.

Wired and tested... \$74.50

Complete kit... \$49.50

### AP-1 ADAPTER

Plug-in IF stage—used with Slicer, allows receiver to be switched back to normal.

Wired and tested, with tube... \$8.50

### NEW AP-2 ADAPTER

Combined AP-1 and xtal mixer. Allows Slicer to be used with receivers having 50, 85, 100, 915 KC and other IF systems. One xtal suffices for most receivers.

\$17.50



**MODEL 20A**

- **20 Watts Peak Envelope Output** SSB, AM, PM and CW
- **Completely Bandswitched** 160 thru 10 Meters
- **Magic Eye Carrier Null** and **Peak Modulation Indicator**

Choice of grey tople model, grey or black wrinkle finish rock model.

Wired and tested... \$249.50

Complete kit... \$199.50

### 458 CONVERSION KIT

Basic 458 Conversion Parts Kit, 15 to 160 meters, with dial, etc... \$15.00  
458 Deluxe Case and Panel Kit, matches size and appearance of Slicer... \$10.00

### NEW — FOR 10 METERS

MODEL 458-10 xtal controlled converter package to extend 458 VFO into 10 meter band. For use with above 458 Conversion Kits.

Wired... \$37.50

Kit... \$27.50



**MODEL 10B**

### SUCCESSOR TO THE POPULAR MODEL 10A

- **10 Watts Peak Envelope Output** SSB, AM, PM and CW
- **Multiband Operation** using plug-in coils.

Choice of grey tople model, grey or black wrinkle finish rock model. With coils for one band.

Wired and tested... \$179.50

Complete kit... \$129.50

### QT-1 ANTI-TRIP UNIT

Perfected Voice Operated Break-in with loudspeaker. Prevents loud signals, heterodynes and static from tripping the voice break-in circuit. All electronic — no relays. Plugs into socket inside 20A or 10B Exciter.

Wired and tested, with tube... \$12.50

WRITE FOR LITERATURE

**MULTIPHASE  
EQUIPMENT**

*Central Electronics, Inc.*

1247 W. Belmont Ave.

Chicago 13, Illinois

See Trade Publications on Multiphase "REJUV-A-TUBE" — A New CRT REJUVENATOR



# New

# Heathkit VFO KIT

MODEL VF-1

**\$1950**

Ship. Wt. 15 lbs.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical features at a low kit price. Coils are wound on heavy duty

and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard 1/4" crystal holder. Construction is simple and wiring is easy.

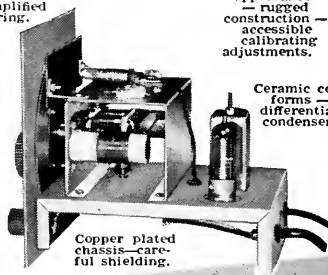
- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

Open layout, — easy to build — simplified wiring.

Smooth acting illuminated dial drive.

Clean appearance — rugged construction — accessible calibrating adjustments.

Ceramic coil forms — differential condenser.



Copper plated chassis — careful shielding.

## Heathkit AMATEUR TRANSMITTER KIT



MODEL AT-1

**\$2950**

Ship. Wt. 16 lbs.

### SPECIFICATIONS:

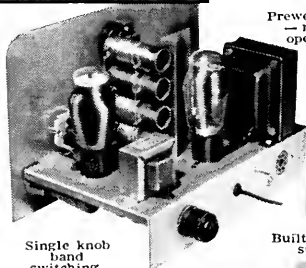
Range 80, 40, 20, 15, 11, 10 meters.  
6AG7 ..... Oscillator-multiplier.  
6L6 ..... Amplifier-doubler.  
5U4G ..... Rectifier.  
105-125 Volt A.C. 50-60 cycles 100 watts. Size 8 1/2 inch high x 13 1/8 inch wide x 7 inch deep.

Crystal or VFO excitation.

Rugged, clean construction.

Prewound coils — metered operation.

52 ohm coaxial output.



Single knob band switching.

Built-in power supply.

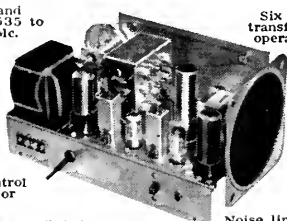
Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

## Heathkit COMMUNICATIONS RECEIVER KIT

Four band operation 535 to 35 Mc.

Stable BFO oscillator circuit.

RF gain control with AVC or MVC.



Six tube transformer operation.

Electrical bandspread and scale.

5 1/2 inch PM Speaker-Headphone Jack.

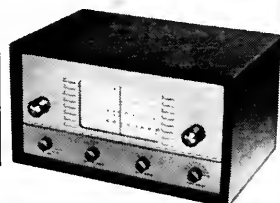
Noise limiter—standby switch.

### SPECIFICATIONS:

Range.....535 Kc to 35 Mc  
12BE6.....Mixer-oscillator  
12BA6.....I. F. Amplifier  
12AV6 Detector—AVC—audio  
12BA6.....B. F. O. oscillator  
12AG6.....Beam power output  
5Y3GT.....Rectifier  
105-125 volts A.C. 50-60 cycles, 45 watts.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio.

Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.



MODEL AR-2

**\$2550**

Ship. Wt. 12 lbs.

### CABINET:

Proxylon impregnated fabric covered plywood cabinet. Ship. weight 5 lbs. Number 91-10, \$4.50.

**HEATH COMPANY**  
BENTON HARBOR 9, MICHIGAN



# New HEATHKIT DX-100

# PHONE AND CW TRANSMITTER KIT



MODEL DX-100

Shpg. Wt. 120 lbs.

**\$189.50**

Shipped motor freight unless otherwise specified. \$50.00 deposit with C.O.D. orders.

- R.F. output 100 watts Phone, 125 watts CW.
- Built-in VFO, modulator, power supplies. Kit includes all components, tubes, cabinet and detailed construction manual.
- Crystal or VFO operation (crystals not included with kit).
- Pi network output, matches 50-600 ohms non-reactive load. Reduces harmonic output.
- Treated for TVI suppression by extensive shielding and filtering.
- Single knob bandswitching, 160 meters through 10 meters.
- Pre-punched chassis, well illustrated construction manual, high quality components used throughout—sturdy mechanical assembly.

## Heathkit GRID DIP METER KIT



MODEL GD-1B

**\$19.50** Shpg. Wt. 4 lbs.

The invaluable instrument for all Hams. Numerous applications such as pre-tuning, neutralization, locating parasites, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1 1/2 meter Ham bands. Complete frequency coverage from 2—250 Mc. using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at \$3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

**HEATH COMPANY**  
A SUBSIDIARY OF DAYSTROM, INC.  
BENTON HARBOR 9, MICHIGAN

This modern-design Transmitter has its own VFO and plate-modulator built in to provide CW or phone operation from 160 meters through 10 meters. It is TVI suppressed, with all incoming and out-going circuits filtered, plenty of shielding, and strong metal cabinet with interlocking seams. Uses pi network interstage and output coupling. R.F. output 100 watts phone, . . . . . 125 watts CW. Switch-selection of VFO or 4 crystals (crystals not included).

Incorporates high quality features not expected at this price level. Copper plated chassis—wide-spaced tuning capacitors — excellent quality components throughout—illuminated VFO dial and meter face—remote socket for connection of external switch or control of an external antenna relay. Preformed wiring harness—concentric control shafts. Plenty of step-by-step instructions and pictorial diagrams.

All power supplies built-in. Covers 160, 80, 40, 20, 15, 11 and 10 meters with single-knob bandswitching. Panel meter reads Driver 1p Final 1g, 1p, and Ep, and Modulator 1p. Uses 6AU6 VFO, 12BY7 Xtal osc.-buffer, 5763 driver, and parallel 6146 final. 12AX7 speech amp., 12BY7 driver, push-pull 1625 modulators. Power supplies use 5V4 low voltage rect., 6AL5 bias rect., 0A2 VFO voltage reg., (2) 5R4GY hi voltage rect., and 6AQ5 clamp tube. R.F. output to coax. connector. Overall dimensions 20 3/4" W x 13 3/4" H x 16" D.

## Heathkit ANTENNA COUPLER KIT



MODEL AC-1

**\$14.50** Shpg. Wt. 4 lbs.

Poor matching allows valuable communications energy to be lost. The Model AC-1 will properly match your low power transmitter to an end-fed long wire antenna. Also attenuates signals above 36 Mc, reducing TVI. 52 ohm coax. input—power up to 75 watts—10 through 80 meters—tapped inductor and variable condenser—neon RF indicator—copper plated chassis and high quality components.

## Heathkit ANTENNA IMPEDANCE METER KIT



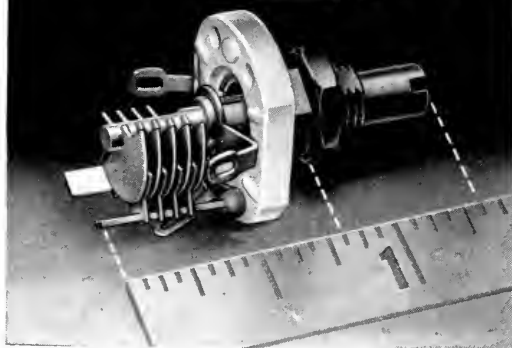
MODEL AM-1

**\$14.50** Shpg. Wt. 2 lbs.

Use the Model AM-1 in conjunction with a signal source for measuring antenna impedance, line matching purposes, adjustment of beam and mobile antennas, and to insure proper impedance match for optimum overall system operation. Will double, also, as a phone monitor or relative field strength indicator.

100 ua. meter employed. Covers the range from 0 to 600 ohms. Cabinet is only 7" long, 2 1/2" wide, and 3 1/4" deep. An instrument of many uses for the amateur.

# "LITTLE MAC" does a big job!



## Ideal trimmer for VHF range

To keep pace with the continuing efforts of the electronic industry toward miniaturization of components, Hammarlund has introduced a tiny variable capacitor, type "MAC". This component provides the low minimum capacity essential for use as a trimmer in the VHF range.

The silicone-treated base is only  $\frac{3}{4}$  x  $\frac{5}{8}$  inches. Its rotor and stator are soldered assemblies of brass, nickel-plated for low losses, while the wiper rotor contact is nickel-plated beryllium-copper. Rotor and stator terminals are positioned to permit short leads. A threaded bearing is provided with flat sides to permit single-hole mounting without turning.

The new units are available to fulfill capacity requirements between 1.4 and 19.6 mmf. Try one in your next piece of gear.



If you haven't received your copy of the Capacitor Catalog, write to The Hammarlund Mfg. Co., Inc., 460 W. 34th St., New York 1, N. Y. Ask for Bulletin C5

# HAMMARLUND

(Continued from page 76)

and VFO. LNM worked T19MHB on 160 meters with his Viking Ranger. RQK has had good luck on 14 Mc. with 40 watts out east. WN9GZS has a four-element beam on 144 Mc. CCO received his 9RN certificate. The present roster of WIN lists 40 members. YZA is active on WIN with a Viking II and an RMLE-70. WN9HYV, using a BC-154, reports an unusual 4-way QSO between 9NSX, 8NSX, 9PCY, and 8PCY. OVO would like to hear prospective EC candidates for Rusk, Barron, Sawyer, Washburn, Burnett, and Polk Counties. If there is no EC in your area, recommend a qualified candidate to the Section Emergency Coordinator, OVO. New EC appointees are KTE, Eau Claire; IYF, Dunn County; and DOH, Buffalo, Jackson, and Trempealeau Counties. FCF is building a 14-, 21-, and 28-Mc. preselector for his HQ-129. GPU, OGT, and OOL handled communications for the CAA over a 23-hour period between La Crosse and Madison, when wire facilities were disrupted and unavailable. Traffic: W6CX 265, IXA 168, CCO 118, RTP 57, SAA 41, RUB 30, DIK 23, UIM 18, FFC 16, YZA 16, IQW 13, KWJ 12, HU 7, RQM 6, SZR 6, OVO 2, SDK 2.

## DAKOTA DIVISION

**SOUTH DAKOTA** — SCM, J. W. Sikorski, W0RRN — Asst. SCMs: Earl Shirley, 0YQR, and Martha Shirley, 0ZWL. SEC: GCP. PAMs: GDE, BNA, NEO, and PRL. RM: SMV. The Mitchell ARC is affiliated with ARRL and officers are GCP, pres.; EYB, vice-pres.; GWW, secy.; GWL, treas. The newly-organized club in the Lead-Deadwood Area has chosen the name of Signal Hill Amateur Radio Club. While on a trip to California, GDE worked mobile on all bands and logged 183 QSOs. New General Class licensees in Vermillion are TMB and TLU, while ZIL is a Novice. OOP/9, EXX, GWA, QKX, and GXD demonstrated a ham station and handled traffic at a hobby show in Freeman. Ex-CSX now is 0LON at Green Bay, Wis. UVL has a call for his workshop at the State Police, ZRC, and STI answers to ZDE at home. KSW now is working for GDE. OO LXQ sent out six reports in February, and actually received a "thank you" from one of them. Net traffic: 75-meter Net (Jan.) 1105 QNI, average daily traffic 5; (Feb.) 1333 QNI, average daily traffic 6; C.W. Net 12 sessions, QNI, 107, traffic 31; 160-Net 28 sessions, 1018 QNI, traffic 104; NJQ Net 25 sessions, 623 QNI, traffic 125, SCT, operating in the 4 S.D. nets and Iowa, was QNI 109 of a possible 115 sessions. TLO received 2nd-class commercial telephone license. Traffic: W8SCT 109, DVB 16, RMV 16, SMV 13, PRR 11, GDE 10, MPQ 8, NWK 8, TLD 7, BQH 5, QKV 4.

**MINNESOTA** — SCM, Charles M. Boye, W0MXC — Asst. SCM: Vince Smythe, 0GGQ. SEC: GTX. RMs: DQL and KLG. PAMs: JIE and UCV. New converts to s.s.b. are SW, HEH, DDN, GGO, and BHY. New net time for the Minn. Junior Net is 1700 CST. Special certificates are issued for reporting in at least twice out of every three sessions. Stickers also are issued for the one with the highest traffic count each month. GTX has been appointed OPS and KLG is the new RM of the MSN. YLZ and his wife Helen have a new baby girl. The Padre Net meets Tue. at 12:30 p.m. between 3890 and 3900 kc. EOF and OTU are net controls. The roster consists of OEF, UYU, YZH, JDR, EYK, UBL, TPN, QTR, OTU, and EOF. KJZ has worked WAS on 80-meter a.w. OOO attended a radio club meeting in St. Paul. TQQ has been vacationing in Hawaii. K6EA's mother-in-law was ill in Pasadena, Calif. He tried to get a message to her so contacted WMA, who got hold of TF, at Orchard Lake, who got in touch with OA5G, in Peru. He relayed the message to VO1 in Newfoundland, who sent it to K6DDQ, at Pasadena, a former Twin City resident. Disser, Communications Officer in the CAP, has been teaching code to Novices and giving them their exams. Some of them who passed are W0NZID, ZIE, ZIG, ZHL, ZHM, ZHO, and TYO. HPV is running 500 watts. The Twin City Area Radio Clubs have joined hands and organized the Twin City Area Amateur Radio Council, or TWARC. The Council will act as an advisory group for the coordination of and betterment of amateur radio in the metropolitan area. It will unite all clubs in one group in case of emergency. OVO built a beam for WMA and RGJ and TJI erected it for him. IRJ is the proud owner of a new HQ-140K receiver. IRD is vacationing on the West Coast. RNY is planning on 6 meters and 420 Mc. OJJ is planning c.w. mobile. ZIA is a new Novice trained by QDP and QDR. Traffic: W0KLG 175, WMA 128, DQL 127, CID 124, IRJ 118, QBW 107, QNY 99, KFN 92, KJZ 83, RVO 78, MVG 66, MVH 61, TKX 47, HIN 39, KNR 39, LST 34, UCV 32, QDP 29, TQQ 27, OJH 22, TJA 22, GTX 16, VPO 16, MNC 14, VBD 13, LUX 12, NJZ 12, OGD 12, RQJ 12, NTV 11, GGO 10, NJT 8, ABA 7, BUO 7, AFP 6, FCU 6, OJP 6, OPA 5, RQV 5, MBD 4.

## DELTA DIVISION

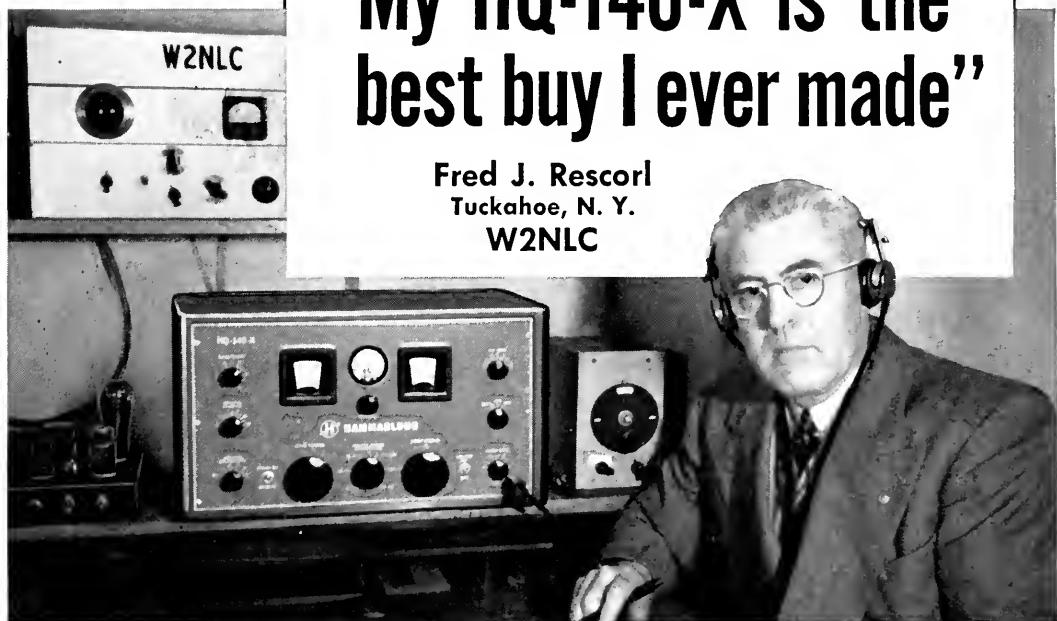
**ARKANSAS** — SCM, Owen G. Mahaffey, W5FMF — The OZK C.W. Net is picking up every week. We now have a nice bunch of new members who are doing a swell

(Continued on page 84)

*Science Teacher-Ham says —*

**“My HQ-140-X is the  
best buy I ever made”**

**Fred J. Rescorl**  
Tuckahoe, N. Y.  
**W2NLC**



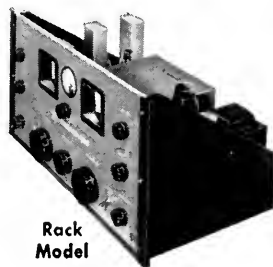
Fred J. Rescorl is both a science teacher and a ham, and as such can appreciate both the practical and theoretical sides of radio. Fred has been a satisfied Hammarlund customer for years, using Hammarlund capacitors and other components in home-built equipment, and now has a Hammarlund HQ-140-X receiver in his ham station.

Fred is enthusiastic about Hammarlund products. In his latest letter, he says, “My HQ-140-X is the best buy I ever made. It’s the receiver I recommend to my friends. It has performed the way you said it would — outstanding sensitivity

and selectivity, with almost no frequency drift.”

Fred J. Rescorl’s happy experience with Hammarlund products is no accident. Rather, it is the result of careful engineering exemplified in the professional characteristics of the HQ-140-X.

Be completely satisfied with your next receiver. Get an HQ-140-X! It’s available either as a cabinet model or for rack-mounting. For complete details, write to The Hammarlund Manufacturing Co., Inc., 460 W. 34th Street, New York 1, N. Y. Ask for Bulletin R5



**Rack  
Model**



**HAMMARLUND**

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... or equivalent professional experience in the communications field.

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... with design experience on small mechanical and electrical parts similar to those used in electronics equipment, or with methods and production experience in this field.

## DESIGNER-DRAFTSMEN

... for diversified work on equipment and components.

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These openings result from steady growth of our company over a period of 30 years. The excellent reputation and wide acceptance of Johnson products have been the result of sound engineering, close control of manufacturing, conservative but progressive management and adequate financial strength. These factors, plus widely diversified lines, lead to job security that is unsurpassed in the industry.

Waseca offers an attractive small city environment, ideal for family life, close to work, to good schools and recreational opportunities in the Land of Ten Thousand Lakes.

If you feel you are qualified and interested in working with a compatible and highly respected group on projects ranging from component items to broadcast and amateur equipment and without the disadvantages of over-specialization and resultant boredom, write to A. M. Pichitino, Chief Engineer. We would appreciate a resume of your education and experience in your first letter together with a recent photo. All responses will, of course, be held in strict confidence.

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210 2nd Avenue, SW

Waseca, Minn.

job on 3790 kc. at 7: P.M. and we welcome more. HEE is our new PAM. Let us all help him get the Ozark Phone Net going on 3810 kc. CAM is a new General Class licensee in Pine Bluff. BUX reported on the c.w. net with a new rig and a nice signal. The Southwest Arkansas Amateur Radio Club at Pine Bluff plans a hamfest in early June. WN5HJO is a new ham in Siloam Springs. He paid us a visit. SXM is our new RM, taking the place of MSH, who was rather suddenly called to Europe on a radio job. I would like to have the news from more radio clubs. Traffic: W5SXM 54, FMF 33, WUX 6, BUX 2, PX 1.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO —LJT is new EC for Lake Charles. IHR resigned because of illness. Officers of the Southwest La. ARC are FDC, pres.; BWZ, vice-pres.; ZAK, treas.; BAK, secy. The emergency net meets each Sun. at 1400 CST on 3850 kc. Istrouma ARC's new officers are WQX, pres.; YSN, vice-pres.; ONM, act. mgr.; URR, asst. to ONM; UNQ, treas.; FMN, secy. On the morning of Feb. 26th at 0300 Baton Rouge had a successful simulated emergency. The Istrouma ARC participated using its new emergency truck complete with gasoline-driven a.c. generator for emergency power. WQX is now WFO. DUS has completed a new rig with 813 in the final. The South La. Emergency Net meets at

(Continued on page 86)

*JOHNSON SIGNAL SENTRY...*

## COMPACT RF ENERGIZED KEYING MONITOR!



\$18<sup>95</sup>

AMATEUR NET

Signal Sentry,  
wired and tested  
with tubes

**Performs 5 important station functions!**

<p>1. Monitors CW Signal</p> <p>2. Monitors Phone Signal</p> <p>3. Serves as "On the Air" Indicator</p>	<p>4. Mutes Receiver for "Break-In"</p> <p>5. Excellent Code Practice Oscillator</p>
---	--

Here's the ideal signal monitor for either CW or phone! Triggered directly by transmitter RF, it operates from 1.5 to 50 mc. with no tuning required. Power is obtained from the receiver or other convenient source. Connected simply by plugging into any receiver phone jack, plugging phones into monitor, and coupling RF probe to transmitter output. CW tone is adjustable from front panel, and a separate audio control permits setting monitor volume independent of the receiver volume setting. Only 3 7/8" x 3 5/8" x 3 3/4" —supplied with cables, connectors, and complete installation instructions. Uses one 12AX7, one 12AU7, and neon tube.



**E. F. JOHNSON COMPANY**

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# EXCLUSIVE! NEW!

## VIKING RANGER with Timed Sequence Keying



- New Time Sequence Keying
- 75 Watts Input CW • 65 Watts Input Phone
- Built-in VFO • TVI Suppressed
- Instant Bandswitching • 7 Amateur Bands

Viking "Ranger" Transmitter/Exciter Kit complete with tubes and all necessary instructions, less crystals, key, and mike.

**\$214.50 Amateur Net**

Viking "Ranger" Transmitter/Exciter wired and tested including tubes, less crystals, key, and mike. . . . **\$293.00 Amateur Net**

For the complete story on the Viking "Ranger" write for Booklet 724 containing detailed information, and schematic diagram.

*NO CLICKS!*

*NO CHIRPS!*

*CLEAN and CRISP  
ELECTRONIC BREAK IN!*



Here it is! The new, improved Viking "Ranger" with the perfect keying system. No more clicks and chirps even when driving a full kilowatt! Timed sequence keying provides ideal "make" and "break" on your keyed signal, yet VFO is keyed for fast break-in. Press the key and the VFO turns on quickly (before the keyed amplifier), and it stays on a fraction of a second after the amplifier cuts off. Wave shaping is then applied to the keyed amplifier stages for a perfect waveform. Time delay sequence is adjustable and may be set to operate so fast that a "breaking" signal can be heard between transmitted dots! Entirely electronic in operation, the system utilizes a type of grid block keying without relays and provides clean and crisp electronic keying.

Buy your Viking "Ranger" today! Truly the finest low power rig available, it packs enough power for enjoyable contacts all over the world. Later using the "Ranger" as an exciter you can add a Viking Kilowatt Power Amplifier and enjoy the ultimate in high power performance and convenience.

## E. F. JOHNSON COMPANY

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0800 Sun. on 3830 kc. The Net is under the direction of DKU, the EC, with YDC, TDY, and BV, Asst. ECs. UJK is chairman of the planning committee. HEJ, our PAM, is in the hospital at this writing. We all wish him a speedy recovery. NG, our RM, reports that Baton Rouge is not suffering for lack of new blood. A large crop of Novices are coming up. SQI received a European QSL that completes his quota for WAC. EA has a new 'scope. CEW has two new rigs on, TVI-free, and worked three new countries on 'phone. SFZ has a new 20-meter beam, three elements 50 feet high. HUT is the new EC for New Orleans. UQK resigned as EC when his new job took him to Houston, Tex. FMO recently put on a frequency measuring demonstration using secondary standard, cycle counter, oscillograph, audio oscillator, and a receiver at the Greater New Orleans Amateur Radio Club, which was well received. Traffic: W5NG 89, W5QZ 84, NDV 47, EA 39, SQI 6, ONM 5.

**MISSISSIPPI** — SCM, Dr. A. R. Cortese, W5OTD — Well, fellows, this will be my last report as SCM for Mississippi. I have enjoyed serving you for the last two years and appreciate all the help given me. Mr. Julian Blakely, your new SCM, is a fine fellow and deserves all the aid you can give him. LXV has a short beam on 20 meters. WN5GDW is on with a Heathkit and wants to work more Mississippi hams. EWE has a new 15-meter beam. TIR knows where you can get a 1000-v.d.c. generator. The Jackson Hamfest will be held the last Sunday in August. The usual good time will be had and I hope I'll see all of you there. Traffic: W5VME 92, EWE 71, TIR 34, OTD 6, RX 2.

**TENNESSEE** — SCM, Harry C. Simpson, W4SCF — SEC: RRV, PAM: PFP, RM: WQW. WQW was visited by GZ and a multitude, and visited LC, HEZ, VBA, BMI, KN4AOK, and BQG. Many Tennessee friends will miss FEL, who moved to Atlanta. WHN now has ART-13 Mobile. GFY, new General Class, is building a VFO and modulator. ZJY is building a new kw. It finally comes out — JU hasn't been on c.w. lately because the tree supporting his c.w. antenna died. HIB reports Chattanooga C.D. Exercise Interim worked nicely on both 'phone and c.w. TDZ reports a good attendance on the Chattanooga Area Radio Net. WQT has 3 new countries on 80 meters. The Clarksville Club teaches code to local Boy Scouts, shows ARRL films at meetings, and welcomes new member 9YKT. WHC, now is /KLT and is looking for Tennessee contacts. The Memphis Club Station, EM, worked the Heart Fund drive, assisted by mobiles ADM, AFB, IBG, SUG, ZKG, FYJ, STI, CV, GQO, PKI, IQX, WTI, YMB, LVM, DIX, DCH, CRP, BDK, UDI, CQO, ACK, RLU, RBL, BAO, ADY, WTI, ATQ, BTZ, HNJ, HHK, and WBK. New 2-meter Memphis stations are PKI, WTI, AFB, FRB, and FRE. The Knoxville Club's new officers are TYU, pres.; TZJ, vice-pres.; SVE, secy.; J. P. Morgan, program chairman, and PHW, publicity chairman. Oak Ridge Operators Club, Inc., operated SKH/4 at the Hobby Show. Brother Luke, an operator at YN4CB, is visiting his many friends in Memphis. Traffic: W4PL 1196, OGG 551, K4FET 265, W4PFP 231, SCF 147, WAX 118, WQW 109, SKH/4 101, CXY 91, IIB 90, TZD 90, PQP 87, BQG 78, K4FEU 72, W4ODR 52, VJ 44, YMB 40, ZJY 40, HIR 33, IVF 32, AFB 31, RRV 27, HEZ 19, TIE 19, SAR 15, UVS 15, TDZ 10, RMJ 6, BAO 5, FLW 5, ISX 5, HUT 5, UOA 5, UDI 4, GFV 3, YPG 2, NPS 1.

## GREAT LAKES DIVISION

**KENTUCKY** — SCM, Robert E. Fields, W4SBI — NIZ is really carrying the ball for the new (KPN) Kentucky 'Phone Net. The first 14 days of the new Kentucky Net operation showed these figures: 236 stations called in, an average of 16.7 stations per net; 32 messages handled, an average of 2.28 per net. Net time is 1:30 P.M. CST. Mon. through Sat. and 8:00 A.M. Sun. The frequency is 3960 kc. CDA, SEC for Kentucky, asks that all Kentucky ECs report to him the number of AREC members they have signed up. Every amateur in Kentucky should register station facilities and availability as an operator with AREC. Registration forms may be had by contacting your EC, SEC, or SCM. The Mic-Key Radio Club of Russellville has a Novice Emergency Net operating Sun. at 2:00 P.M. CST and Thurs. at 7:00 P.M. CST on 3735 kc. under the capable leadership of JHU. The Novice Net has 15 active stations at the present time. Our hat is off to you, Marvin. Traffic: K4WBG 420, W4KKW 369, K4FBW 92, W4NIZ 64, RPF 54, HSI 49, CDA 47, SBI 42, JCN 41, GFG 19, HEA 12, ZDB 12, ZDA 11, KRC 7, URF/1 5, K4AXE 4, W4SUD 4.

**MICHIGAN** — Thomas G. Mitchell, W8RAE — Asst. SCMs: Joe Beljan, 8SCW; Bob Cooper, 8AQA. SEC: GJH. With HKT retiring as our SCM I am sure that you will join me in expressing our thanks to him for a job well done and extend to him best wishes for the future. In taking over the duties of this office I pledge you my very best effort to maintain the same calibre of service that you are accustomed to. Many thanks to all who supported me in the election. There is no misunderstanding on my part that this is a one-man job. Rather, it is one of coordinating the cooperative efforts of all members in this section. Let's all keep striving to keep the fine reputation that we in Mich-

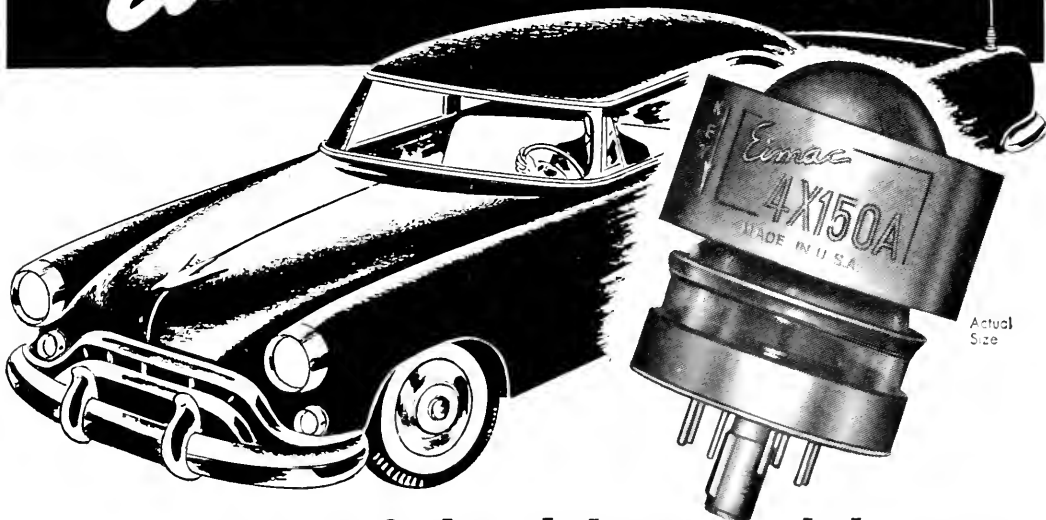
igan enjoy. Examination of the appointments file indicates a laxity on the part of some appointees to have their appointment certificates endorsed. Please be reminded that failure to keep your appointment current is basis for cancellation. It is impossible to notify each appointee when to apply for endorsement — it is your responsibility. Word from our SEC regarding approval of the Michigan Communications Plan is encouraging. As soon as it is ratified by the FCC and the FCDA, our RACES Plan can blossom into being. Many AREC registrations are being received, but many more will be needed to fill the ranks. GJH has spent much time doing the ground work so let's show our appreciation by backing him and the rest of his AREC organization with a solid membership. Remember, fellows, in the event of a disaster only those qualified as RACES stations will be allowed to help. Traffic: (Feb.) WSNUL 144, ILP 137, URM 75, NOH 73, SWG 68, IJH 66, DAP 60, QIX 59, HKT 58, PHA 54, SRK 52, WVL 49, FX 40, IV 37, OQH 27, WXO 25, ZHB 23, RAE 22, HSG 21, AUD 17, DSE 17, TBP 12, PHM 10, NTC 9, QOK 7, EGI 5, FSZ 4, TQP 4, TIC 3. (Jan.) W8IKX 44, MLR 44, IV 41, TQP 4.

**OHIO** — SCM, John E. Siringir, W8AJW — Asst. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8JNF; E. F. Bonnet, 8OVG. SEC: UPB, RMs: DAE and FYO. PAMs: EQN and HUX. DAE and FYO made BPL for February traffic. New appointments are GLM as EC, WNSUJG as OES, and MYV and OMK as OBSS. ELX is looking for stations on 20-meter 'phone in the Youngstown Area at about 2000Z. DZO will remain indefinitely in Arizona. Recently-elected Intercity Radio Club officers are HTO, pres.; OZZ, vice-pres.; and QXD, secy. MHF and NFO are the transmitter-hunting champs in Cincy, while IFX and HDA invariably finish last. VPX is the assigned call of Patterson Co-op High in Dayton. ILC has been bitten by the 2-meter bug. IHF is conducting code and theory classes for his neighbors. This is one way to alleviate TVI complaints. The Tiffin gang was scheduled to join ranks with the SVARC in Fremont on Mar. 14th to honor our fabulous SEC, PBN's Boy Scout students are making great progress, with WNSSA1 attaining a nice score in the Novice Roundup. RCJ reports he now has 33 states worked. The Lake and Geauga Club had 36 attending its annual dinner. WNSSVL's 25 watts gives the Cincy "Big Boys" something to worry about. According to DAE, the Sat. and Sun. 1100 BN sessions are bringing 'em out. The Net has procured 1000 message cards with a pool of 12 sharing the expense. This should afford excellent publicity for BN and the National Traffic System. LVE has returned to Columbus and has resumed his duties as NCS of the 2-meter FM Net. QEF did a nice job as acting NCS during his absence. You can't beat the feminine touch! New officers of the Toledo Mobile Radio Assn. are VQP, pres.; MBE, vice-pres.; MNR, secy.-treas.; and OFG, corr. secy. The *Nelsonville Tribune* gave the Hocking Valley Club a front-page spread with numerous references to Rita, HPP, Ohio's "Miss Amateur Radio." PIZ is the new activities manager of the Van Wert Club. Hamilton's *Feed Line* reports that VHS has gone mobile and that the club mobile frequency is 29.1 Mc. Dayton's *RF Carrier* informs us that ILC and RKJ are conducting code practice sessions; QFA is on 220 Mc.; Novices VGA and UVW are YLs; and the Hamvention program is shaping up beautifully. The Columbus *Carascope* states that ZYU is running high power with 80 watts; AER is operating mobile in Florida; JDK and VHO are vacationing in Florida; and WNSVFI was the leading local scorer in the Novice Roundup. The OVARA's Ether Waves has developed into a first-rate DX publication. New OVARA officers are 4EPA, pres.; 8DQC, vice-pres.; 4JBQ, treas.; 8SDJ, secy.; 4OMW, editor; 4KVV, DX editor; SDJ, v.h.f. editor; and PBU, act. mgr. The Hocking Valley *Key Kicks and Feed Back*, the newest bulletin received here, tells us that LQH has gotten on 75 meters; LGR/M worked Connecticut on 75 meters; HPP has a new romantic interest; and membership is now up to 35. Springfield's Q-5 features an article by OKB on how to work DX. The Toledo *Shack Gossip* relates that BIQ has 76 countries on 15 meters; YAE is making his home in Toledo; TLC's son is serving in the Far East; HCN has an 813 clicking on 20 and 75 meters; and OKO has deserted 160 for 80 meters. Eastern Ohio's *Ham Flashes* reports that BZW has Youngstown's first TV transmitter; PWI has returned to 10 meters; JWC has erected a 44-foot vertical; OYQ is a city detective in the Youngstown Police Dept.; the Tri-State Club meets at RZ's home every other Fri. night; and EX is attending Fenn College in Cleveland. Traffic: (Feb.) W8FYO 582, UPB 293, DAE 248, LHV 186, ARO 175, IFX 88, NIQQ 76, ILC 75, HNP 73, AL 67, LZE 58, IJH 47, MVJ 46, KDY 35, AJW 27, EQN 26, BEW 16, GZ 13, TLW 12, LMB 10, ET 9, AJH 8, AYR 8, HFE 7, OQP 7, MGC 6, QIE 6, HJZ 4, LGR 4, LZR 4, NQQ 4, PIJ 4, FBZ 3, TJD 3, HPP 2, HUX 2, RO 2, SAQ 2, WYL 2. (Jan.) W8LHV 106, IFX 65, BEW 12, PBX 10.

## HUDSON DIVISION

**EASTERN NEW YORK** — SCM, Stephen J. Neason, W2ILI — SEC: RTE, RM: TYC, PAMs: GDD and IJG. (Continued on page 88)

# Eimac 4X150A



## ...heart of the deluxe mobile rig!

**P**OWERFUL all-band operation through 420mc, top performance in double or single sideband service and more watt-hours per dollar make the Eimac 4X150A radial-beam power tetrode a tube for the deluxe mobile rig. The advantages offered by the versatility, power and reliability of the Eimac 4X150A make the necessary simple forced-air cooling well worth while—with an Eimac Air-System Socket an automobile defroster type blower is all that's needed to do the trick. With 1000 volts on the plate in typical plate modulated service, the Eimac 4X150A delivers 150 watts of useful plate power output with 200 watts of power input and only 2 watts driving power. The high power gain Eimac 4X150A is also ideal for increasingly popular Single Sideband mobile application. In typical AB<sub>1</sub> operation at 1000 plate volts, it delivers 150 watts of peak

### TYPICAL OPERATION

	Class AB <sub>1</sub>	Class C Phone
D-C Plate Voltage	1000 volts	1000 volts
D-C Screen Voltage	400 volts	250 volts
D-C Plate Current	250 ma	200 ma
D-C Screen Current	30 ma	20 ma
D-C Grid Current	0 ma	15 ma
Driving Power	0 watts	2 watts
Plate Power Input	250 watts	200 watts
Plate Power Output	150 watts	150 watts

The plate power output shown does not allow for circuit losses. The 4X150A may be operated at maximum ratings up to 500mc.

envelope power output with virtually no driving power requirement. Maximum ratings show a peak envelope power output of 350 watts with 2000 plate volts. This outstanding performance can be yours by taking incomparable Eimac quality on the road with you in the heart of a deluxe mobile transmitter.

For further information about Eimac tubes and applications write our Amateur Service Bureau.



**EITEL - McCULLOUGH, INC.** SAN BRUNO  
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The World's Largest Manufacturer of Transmitting Tubes



The SARA is conducting a WAS contest for its members. The contest started Feb. 7, 1955 and will end on Feb. 7, 1956. K2BE has replaced his old end-fed horizontal with a 44-foot vertical ground plane on 3.5 Mc. It works FB. K2BSD is very proud of the certificate of merit he received from the 2nd Regional Phone Net. New officers of the HIIRL are AAD, pres.; K2DRN, secy.; K2AVZ, treas.; and OIT, act. mgr. K2EHI has a new 1500-watt portable power plant and two rigs operating on all bands. KN2JWM, the son of IIM, is active on 7 and 3.5 Mc. with a Viking Ranger and a Window antenna. Mike is interested in the traffic nets. Congrats to K2CIX and his new NYL. K2BOT gave an FB talk and demonstration with an electronic key at a recent meeting of the YARC. K2EDH received his well-earned Section Net certificate for activity on NYS. K2BJS, our acting RM for NYS, makes BPL again. RUF, mgr. of NYS, reports that outlets are badly needed for the area between Schenectady and Plattsburg, also in Sullivan and Delaware Counties. Attention ECs: If your appointment is due or past due for endorsement and you wish to continue, it is important that you notify the SCM within the next thirty days. Failure to do so will result in immediate cancellation. KN2GZM has a 522 on 144 Mc. K2DRN has a box of parts he hopes to whip into a Viking Ranger. K2CQS completed his s.s.b. rig. K2AJN is on 3.9 Mc. KN2HXR is building a 150-watt final designed by K2CQS. WRI is operating s.s.b. and is busy building a 300-watt final for his 20A. Traffic: (Feb.) K2BJS 601, EDH 53, W2LRW 38, K2BSD 26, BE 15, EHI 13, W2BSH 6, (Jan.) W2LRW 40.

**NEW YORK CITY AND LONG ISLAND —** SCM, Carleton L. Coleman, W2YBT — Asst. SCM: Harry J. Dannals, 2TUK. SEC: JAL. PAM: JZX. RMs: VNJ and LPJ. ZAI reports AREC/RACES activity is excellent in Brooklyn, Queens, Staten Island, Nassau, and Suffolk. Nassau 10-meter AREC is planning monthly hidden transmitter hunts. APO assisted in the Nassau-Suffolk 10-meter relay during RACES drill. VNJ has started NLT (NLI Training Net) at 1530 EST on 3710 kc. (Mon., Wed., Fri.). This is an excellent opportunity for Novices and slow-speed operators to get started in traffic-handling. LPJ made BPL again and became the sixth NYC-LI medalion winner. KEB/KFV again tops the traffic list. K2CQP made BPL and is DX-hunting on 80 meters. JOA needs Asia for WAC. OME has a new mobile antenna. Illness in the JZX family has kept Vi from being on the air regularly. K2AMP built an antennascopes. AEF is participating in propagation reliability tests requiring over 100 hours per month of operation. K2IWW became General Class. K2ECN is the new Asst. EC in Brooklyn. The BAREC Net has PNR, K2DDE, and KN2IXP as new members. K2JYL is on the air with 5 watts. BO is remodeling the shack with a new console. IN has 20-watt s.s.b. rig on 40 meters. PF would like to start an s.s.b. traffic net. Anyone interested? K2DVT is building a new c.w. and s.s.b. rig to replace the 20-watter. EEN has a new 40-foot tower for the 20-meter beam. DLO completed a 20-meter shortened beam in time for the DX Contest. K2AMM has finished the 220-Mc. converter. K2ESZ has a 6360 rig planned for 220 Mc. K2HYK plans 150 watts 'phone/c.w. IVU and IVS are competing for CD Party section honors. JBU soon will finish redecorating and will return to the NLI Net. NEG is finishing the 40-meter ground plane. LGK and K2CJP earned Net certificates for their activity in Queens AREC. KN2LIX is a new Novice at HJ. K2JPG dropped the "N." K2ANE is active from East Norwich on 40 and 80 meters. The Lake Success RC, YKO, is heard on 144 Mc. New members of the NYRC are K2s ERL, GOT HGP, IMD, and JFQ, and KN2s IAD, JVT, and LAG. K2EJM is the Fordham RC call, with AMR, NSH, RRR, K2s BTJ, IFO, IKZ, ISK, and KN2IBZ as new members. News from Suffolk County finally arrived! The Suffolk County RC officers are MZB, pres.; JFU, vice-pres.; K2BTT, secy.; and OKK, treas. OOO has a new YL. FIIX was presented with twins, a boy and a girl. TPZ became a grandpa. EX-RTZ, now SUFZ, is 8UKV's NYL. CXG is with the USAF in Mississippi. IYS is operating the s.s.b. rig on 75 meters. EAF, FTY, and MZB are getting started on 2 meters. AJF may join them. It looks like a new club may start in Eastern Suffolk, with K2EC leading the way. AJR is chasing DX on 15 and 20 meters. YBT has moved to a new house. K2BAH is looking for 220-Mc. activity in the Richmond Hill Area. New officers of the SIARA are IIFQ, chairman, GGI, treas.; IPA, rec. secy.; and VKF, corr. secy. K2EUZ has 500 watts almost ready to go. JUN has a new Terraft 2-meter converter. NEG is beginning a radio club at Seaford H.S. The New York Radio Club is holding its third annual picnic and transmitter hunt at Bethpage State Park, at Bethpage, Long Island, N. Y., on Sun. May 22nd, starting at 11 A.M. Women and children free; all OMs \$1.00. All hams are welcome and a good time is assured. Refer inquiries to CYK, picnic chairman. Traffic: (Feb.) W2KEB 637, KFV 636, K2CQP 507, W2LPI 502, VNJ 348, JOA 209, OME 157, K2ABW 114, W2JZX 110, MUM 108, K2AMP 81, W2AEF 72, DSC 64, GXC 38, K2CRH 32, W2OBU 20, BOAEF 13, IN 11, K2AEI 10, W2PF 10, K2DVT 1. (Jan.) K2CQP 402, W2IVU 186, IJ 20, GXC 16, (Dec.) W2CXC 80.

**NORTHERN NEW JERSEY —** SCM, Lloyd H. Mana-

mon, W2VQR — SEC: IIN. PAM: CCS. RMs: EAS, CGG, and NKD. OGU has been appointed Technical Advisor to the Raritan Bay Radio Amateurs Club. K2EQD has returned from a Florida vacation. Hal also is a new OO. TTM is on the air with a new 829 in the final on 144 Mc. K2DDM is busy getting settled in his new QTH in Sayerville. Our thanks to K2BEV for keeping us informed of activities of the RBRA. COT is working on an s.s.b. rig. New hams in the Livingston Area are NMB and KN2LFD. The Teen-Age Rag-chewers Net meets Mon.-Fri. on 3525 kc. New members are invited to call in any time. KN2HXP is building a new rig with 6146 in the final. CCS is back in the swing of things after a lull in activity. Henry has just finished his term as director of TCPN. The new second-call-area director is HTD, of Red Bank. Code and theory classes conducted by the Irvington Radio Amateur Club are very well attended. Average attendance ranges from 20 to 25 each session. KN2JCA and KN2IRM have passed their General Class exams. NLY received WPR-50 certificate. K2EQP is busy with a new VFO. K2GBP is putting his mobile rig in the new car. COG receives the sympathy of the gang on the death of his mother. AYP is back in civilian life. AQC is on 144 Mc. with 1.5 watts and six-element beam. K2HHG is working DX from his mobile rig while going to and from work. K2BIF prefers working DX to writing out tickets — he's a cop! NSG, the modern ham station at Upsala College, has installed a c.c. job for Novice members of the college radio club. GTF is a complete DX station at St. Peters College with K2AEK trustee and chief of operations. KN2KJP, a student in the senior term of TV school, has been assigned the station call to match the initials of his name. K. J. Pelletier. KN2IGH has a new jr. operator, a son. KFR reports the Penn-Jersey Radio Club meets the 1st and 3rd Wed. of each month at County Court House, Belvidere. NKD is in a new QTH at Scotch Plains. OO reports were received from seven appointees this month. NIE is the proud owner of a new 20-A s.s.b. exciter. Your SEC, IIN, is going through the EC appointments and weeding out the inactive members. If your appointment has lapsed and there is no report of activity for a period of six months or more, he is cancelling the appointment. We notice that some of you still are mailing your reports to the office of the SCM at the old QTH. Please check page 6 of QST for the new address. Word has been received from ZK, aboard the *Atka*, in the form of an official New Year's greeting. The letter was received as a first-day cover from the ship's post office dated Jan. 12th and now is framed and adorns the shack wall at VQR. Traffic: W2EAS 135, K2GFX 81, BWQ 14, W2CCS 12, CFB 8, BRC 7, NIY 3, CVW 1, HXP 1.

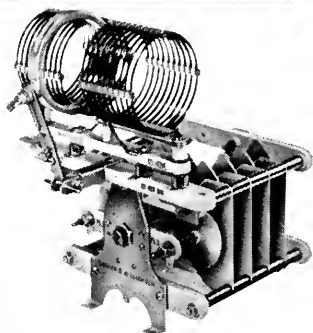
## MIDWEST DIVISION

**IOWA —** SCM, William G. Davis, W0PP — The Waterloo Club has an activity calendar out for the full year. Good idea! Twenty-seven reported this month. New officers of the Clinton Club are KGZ, pres.; JAD, vice-pres.; USF, secy.; 9ZIP, treas. HMM has a father/son team in his classes i.e., D8T and W9WYE. The club at Luther College is progressing nicely. QLU sends in the first report I've had from an OES. BDR apologizes because there wasn't more traffic to report and he's still No. 1. HI! SCA gets his 50th BPL. We have three crowding for BPL — PZO, CZ, and LJW. Hope they make it before my term runs out. New stations on TLN are UCE, UIJ, and SQE. RJX represents TLN on TEN each Fri. night. LJW has a new 140-X. PP has a new SX-96. A new WN in Burlington is 13-year-old KN0AAH. KP4WU/ø now is W9ZOH. EHH now has a Globe Scout 40-A and an HQ-140X. New Novices at Creston are ZUZ and ZAZ. Ben Fowler, Iowa c.d. director, spoke at the Ft. Dodge Club. PAN is hoping for a BPL. HWV reports that KWT, UTD, OPQ, and HWU put on a program demonstration for the Science Club of Independence High School Feb. 10th with 50 in attendance. New hams in Waterloo are OFV, WN0ZLL, and WN0ZHA. WN0TOI is hot after his General Class Ticket. A new Novice in Des Moines is ZZM. Traffic: W0BDR 1459, SCA 1225, PZO 364, CZ 321, LJW 218, QYA 79, EHH 62, KVI 34, LFZ 33, BLH 31, NGS 23, PAN 22, RMG 21, SEK 9, HWU 6, FDM 5, UTD 4, HXA 2, NYN 1, WN0TOI 1.

**KANSAS —** SCM, Earl N. Johnston, W0ICV — SEC: PAH. PAM: FNS. RM: KXL/NYI. The WARC held its annual banquet and installation of officers Feb. 17th. New officers are BIX, pres.; WNN, vice-pres.; BVM, secy.; and IJV, treas. The Lawrence ARC held a meeting in the new quarters at Police Headquarters Feb. 25th to discuss plans for c.d. The CKRC of Salina conducts code and theory classes every Tue. and Thurs. The 1st class produced 6 Novice tickets. Also the CKRC mobile group helped the Police collect more than \$8,000 for the "Mothers March for Poho." PSL has a 20-A s.s.b. rig, making 4 for Salina. MYG visited ARRL at West Hartford. WN0ZQG, who has a Globe Scout and an NC-173, is a new station in Colby. LBJ received his RCC certificate. LQX is working for his WAS on 80-meter c.w. MOX reports 2-meter contacts with FRK, OTN, and several KC boys. KEC and ZDB, of Lawrence, have made several 420-Mc. contacts. DIU, of KXXX fame, has acquired an XYL. ECF, of Topeka, is back on the air with a new Ranger. LIX is having success with his

(Continued on page 90)

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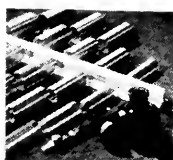
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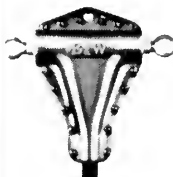
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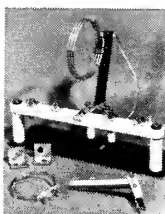
Permits efficient, water-tight, coaxial cable connections for antenna systems. In addition, it serves as a center insulator for a half wave doublet antenna. Ruggedly constructed of aluminum, with steatite insulation, connector withstands a 500 lb. pull.

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new mobile. UML is active in the Nebraska Slow-speed Net. In case some of the Novices haven't heard of it the Kansas Novice Net which started Feb. 27th is called "QKN" and meets on 3735 kc, at 1400 Sun. Am sorry to report another Silent Key this month. WNØYPO, of Topeka, Traffic: (Feb.) WØOHJ 385, BLI 266, UAT 243, NLY 242, FEO 90, MXG 82, ABJ 61, EOT 54, NFX 45, FDI 42, KSX 42, ECD 33, LQX 24, LCQ 22, FNS 21, IFR 19, SQX 18, YJU 17, SAF 16, SVE 16, LOW 15, ONF 13, YFE 13, TNA 11, KFS 10, LQX 9, ICY 7, ITO 7, ZUA 7, VBQ 6, TRG 4, DEL 3, UML 3, RXM 2, LIX 1. (Jan.) KØFDL 403, WØMXG 50.

**MISSOURI** — SCM, Clarence L. Arundale, WØGBJ — SEC: VRF, PAM; BVL, RMs: OUD and QXO. The Rolla Amateur Radio Association has elected the following officers: NXG, pres.; MRV, vice-pres.; PKX, secy.; GCL, treas. LQC has been awarded the MARS station-of-the-month award for the 10th Air Force 16-state area. EBE's mother recently passed away. QMF installed a VFO in the 144-Mc. rig. OMM won for the WØ section in the YL Anniversary Party. CKQ received his CP-25 and A-1 certificates. RTW added a modulator to his Heath AT-1. HUI received an A-1 certificate. TCF added a Q-multiplier to the NC-88. PNA is rebuilding the transmitter. OIV has a new Viking II. VPQ is EC for Waynesville Area. WNØYFV has a new SX-42, ESY an HT-9, and NVJ a new SX-99. FLN has joined the MARS organization. WAP is having excellent results with the Show-Me Net since moving to 3580 kc. I wish to thank the radio clubs and individual amateurs in our section for their splendid cooperation and assistance during my terms as SCM. It has been a pleasure to have served you the past four years. I wish to urge your continued support of GEP, your new SCM, who is a very capable man with a great deal of experience in traffic work. Traffic: (Feb.) WØCPI 1033, KØFBO 391, WØGAR 306, GBJ 260, BVL 210, OMM 126, SAK 110, RTO 97, CKQ 86, WAP 69, VPQ 64, RTW 62, OUD 55, WØLHB/Ø 52, WØBE 49, KA 45, KIK 42, HUI 31, OMP 26, PNA 26, SUV 25, QMF 10, TSZ 9, WIS 9, ECES, MFB 8, RCV 7, BUL 4, WNØZOI 3, WØETW 2, TCF 2. (Jan.) WØETW 56, QWB 8, WIS 4.

**NEBRASKA** — SCM, Floyd B. Campbell, WØCBH — Asst. SCM: Tom Boydston, ØVYX. SEC: JDJ. Total QNI for the C.W. Net was 411 QTC 441. New members of the net are GEQ, GDZ, RIN, DDT, EZT, QMY, and FXH. 5DTA/5 has been reporting into the Net from Fort Worth bringing traffic from Florida and Southern points. BEN, from Colorado, also has been a frequent reporter into the C.W. Net. DDT has a CP certificate. RNI and KDW have received certificates for TEN. RDN also has 5000 Trafficers Club certificate. PZH has rebuilt and now has 200-watt 'phone and c.w. all-band VFO with hot and cold water. AIN was notified by KOGA, at Ogallala, to get on the air during a recent blizzard when some people were lost. ERM assisted and everything worked very smoothly. Stations helping out were LOD, ZAA, GEQ, UOB, and BEN. The SOO Radio Club of Sidney is planning big things. GDZ has a new 75A-3, Viking II with VFO and all the trimmings. RHL is secretly eyeing a better location for DX and better antennas. OED is back on the air with 65 watts 'phone and c.w. AZC, RCH, VUO, and ADK are on 40-meter 'phone. The Union Pacific Radio Club is being organized. Any amateur employed by U.P. is eligible. Drop a line to R. D. Burghart, WØWR, Box 501, Valley, Nebr. Be sure to give your occupation and enclose your QSL. Traffic: (Feb.) KØAIR 385, WØRDN 302, ZIF 189, RNH 165, RIN 135, KDW 66, HTA 50, MAO 33, VYX 33, FQB 30, FXH 29, AEM 24, ERM 20, DDP 16, AGP 12, CBH 12, EQG 12, HQN 12, OCU 12, ORW 12, FTQ 11, BEA 10, FMW 10, GVA 10, ZGH 8, IRW 7, PUT 7, QXA 7, AIN 6, IAY 5, NIK 5, HXH 4, RAM 4, UJI 4, BOQ 2, CIH 2, FRF 2, LEF 2, NGZ 2, NHS 2, PDJ 2, PZH 2, UOV 2, PPT 1. (Jan.) WØRDN 166, KDW 32.

### NEW ENGLAND DIVISION

**CONNECTICUT** — SCM, Milton E. Chaffee, W1EFW — SEC: LKF, PAM; LWW, RM: KYQ, MCN and CN 3640, CPN 3880, CTN 3640 Sun., CEN 29,580 kc. CN moved 187 messages in 24 sessions according to KYQ, the RM, KYQ, RGB, RFJ, and LV rated QNI honors. CTN meets Sun, at 0900 on 3640 kc, and is ideal for the new traffic men and those who want to learn traffic-handling at slow speed. RFJ is net manager and will welcome all comers — straight keys only. MCN rolled up 163 messages in 23 sessions with QNI leaders YNH, IBE, RGB, and RFJ. CPN accounted for 114 messages listing KGT, LWW, VSH, VWL, YBH, and DAV topping their QNI list. UJG reports lack of time is holding up his v.h.f. developments. ICP put on his TVI talk and demonstration for the Hamden Club Mar. 9th. EDA schedules 6LQU, 7ZZZ, and 4CSD and also checks into UTL. YBH is a regular on DSDN, TCPN, and CPN. APA is active on 7-Mc. 'phone and has worked 35 countries there. BDI is trying a CD-2 on 144 Mc. YNC reports his traffic activity still is hampered by low power. WNH is back in business on CN and other schedules. GIX renewed OPS, OBS, and OO appointments while TD renewed OBS, AOS, FSH, and MHF renewed EC appointments and AMJ became a new EC in Waterbury. WHO has a new Ranger on 28.5 Mc, and a new 144-Mc. final featuring

(Continued on page 92)

# The 1955 EDITION OF *THE* RADIO AMATEUR'S HANDBOOK

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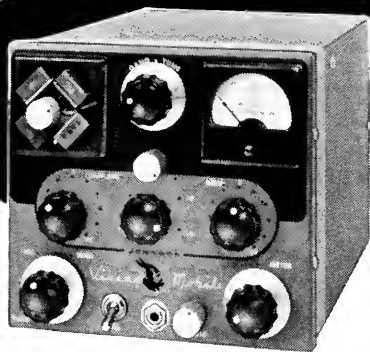
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a pair of 6146s. VLE wrecked his 829B so retired temporarily from 144 Mc. ULY is a mobile member of DSDN. The IICARA meeting Mar. 18th featured a talk by Al Pichitino, chief engineer E. F. Johnson Co. BGP reports new Novices DML, DOU, OXJ, and DZC in Stratford. New officers of the Meriden Club are STT, pres.; WEE, vice-pres.; ULL, secy.; and OOC, treas. MARC has resumed publication of its *Key Klix*. ZJV reports KNT is credited with a big assist to new Novices AES, BSZ, and CLL and new General Calls to ZJY and ZJZ. BYB and VW came through with OO reports. ZFK is ready for business with Technician Class ticket. Traffic: (Feb.) WYB, BPI 141, CUI 129, AW 118, EFW 100, KYQ 99, NJM 85, LV 86, RRE 120, YYM 80, LIG 54, HYF 61, REF 44, BDI 38, ZDX 35, APA 29, UED 26, QJM 20, EDA 18, KV 17, AYC 10, RVB 7, JTD 6, WNH 6, FTM 5, GVI 4, SJ 4, (Jan.) WFTM 16.

**MAINE**—SCM, Bernard Seamon; WIAFT—SEC; BYK, PAM; WRZ, RM; OHT. The Pine Tree Net meets Mon., Wed., and Fri. on 3596 kc. at 1900 hours. The Sea Gull Net meets Mon. through Fri. on 3940 kc. at 1700 hours. The Barnyard Net meets Mon. through Sat. on 3960 kc. at 0700 hours. The OX Net meets daily at 2000 hours on 29.5 Mc. This is a true emergency net composed of eighteen RACES stations in Oxford County. The radio club over there places posters in prominent spots in the County inviting the filing of traffic. A nice note was received from LDC, who works high atop Mt. Washington at MTW-TV. BOK has been elected as assistant fire chief of Dexter. AWN, of Lincoln, is recovering from serious surgery at the Eastern Maine General in Bangor. The best to you from all the gang. Al YDX is carrying on very much alone down in Kittery on 430 Mc. He would like some contacts. WRZ is on with a fat 400-watter. The Maine amateurs again have asked the Maine State Legislature to issue them distinctive automobile license plates in order that they may be of even greater public service by being readily identifiable to police, fire, and e.d. officials. Your SCM has appointed BPI chairman of the License Plate Committee. Al and about fifty Maine amateurs appeared before the Transportation Committee and gave a good accounting of our aims and ambitions. Traffic: WWTG 102, LKP 99, UD 50, LYR 44, ZME 43, YVW 29, EFR 34, BX 20, B TY 17, YTE 12, AFT 8, WRZ 7, FKX 4, TGW 2.

**EASTERN MASSACHUSETTS**—SCM, Frank L. Baker, Jr., WIALP. New appointments: WUV Foxboro; TEF Wilmington; XZV Marshfield as ECs; TNK as OO. Appointments endorsed: LJT Brockton, RRA Winstchester, AR Belmont, VRK Swampscott, AGX Peabody, TQP Area 1 Radio Comm., and DPC Ayer as ECs; LJT as OES; QML, AGX, and WSN as ORS; HLL, MD, and AR as OPS; CTR and SPL as OBSs; and JOJ as OES/OBS. ZZX is Sautt Radio Club president. 6MU is visiting in Quincy. Heard on 2 meters: CEL, NBS, APW, ZZZ, WNI, CWB, QZF, ZED, ZGL, DPN, ZSD, ZXH, DW, DRI, CHN, and HZYK/L. KHH is on 10 meters. Heard on 20 meters: ARG, WHD, VMU, KYV, EGR, UWB, LR, and ALP. ALP has a Match Box for his Viking II. New General Class hams: AJG, BNZ, CSP, DIL, APL, ZVS, BJX, and CPP. New Tech. Class: CES, DDN, ZAX, WQH, YRI, CPW, and CQE. Novices: DPC, DWI, and DWG. ZEN/RCL visit CTR, UIR, VOU, KWD, and CTR at working on a Quad beam for 2 meters designed by MME. The Arlington C.D. Net had a checker game on the air. FWQ is Radio Officer and LLY is Alternate. The Lexington Net visited THO for Panadapter checks on mobile signals. AGX has a new QTH in West Peabody. Radio Amateur Open House had a talk by TCG on Indicating Instruments in the Ham Transmitter. Area 1 Radio Comm. held a meeting with BL, KTG, CQ, OTK, ZYK, and ALP. The South Shore Club held regular meetings. The Braintree Radio Club, DUO, held a meeting in its new quarters. WSN has a new rig for 20 meters. BGW still is on RTTY and has sked with VE2ATC on Sun. a.m. TUD and DWO are on 160 meters. DQF has her rig in her kitchen. SSA is back on 10 meters. TYU is in Quincy Hospital. CF and PIG are now K2FM and W2PIG at Hixon. N. J. VTH moved to Weymouth. DXQ now is in Quincy. TYX has a new QTH. CLF has a new wide-spaced four-element beam for 20 meters. QLT has a Viking Adventurer and RME-69. BSY gave a talk at the Wellesley Amateur Radio Society on Using All-Band Antenna with Tuned Feeders. The Buzzards Bay Cape and Islands Emergency Net meets on 145.360 Mc. at 1900 Mon. BCN is N.C. and CMT. LUM, DFO, OH, PMC, CUY, DRC, TYZ, TUV, DUL, AQN, LNR, MYE, ZGO, LYV, YTI, MFI, QVL, JNL, MNF, NKS, ZSJ, YAN, and MKW are on. KBN and UOZ are members of the College Net. The Norwood c.d. group helped out with mobile rigs when 3 Boy Scouts were lost. SIX reports a e.d. demonstration of communications at Georgetown with AFJ, WTK, KT, CVG, YXL, and WCI helping out. They used 2-meter radio units in 5 cars with one in the Central Fire Station. TTY has a Ranger kit. UKA has a new job. PIW is on 10-meter c.w. PYM will have high power on 20 meters. QMU plans a long wire in Stoughton. SXD is back at work again. UUI has a new 20-meter beam. LMU is trying low power on 10-15 meters. RM has a new mast. Newton c.d. members meet on 6 meters Sun. nights. EK has a Sonar rig at work. JOW is on 6-meter f.m. DGY has his General Class license. CGP has moved to Hialeah, Fla. The Winthrop c.d. group had the

(Continued on page 94)

## The "Robert Dollar" Oscillator

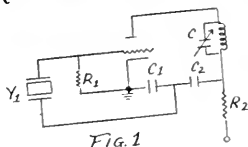


FIG. 1

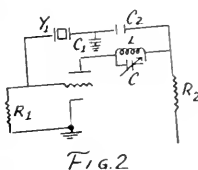


FIG. 2

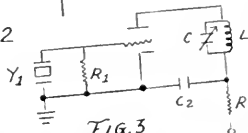


FIG. 3

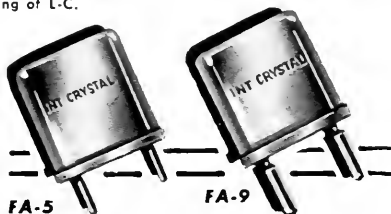
International CRYSTAL Mfg. Co., Inc.

## Further discussion of the "Robert Dollar" Oscillator

Last month we discussed use of the circuit shown in Fig. 1 for overtone use; and, as redrawn in Fig. 2, as a basic Pierce Oscillator. (QST, April, 1955).

Now, if capacitor C (Fig. 2) is tuned to approach the third overtone resonant frequency, a point will be reached where the crystal ceases to oscillate on its fundamental and begins to oscillate on its overtone frequency. At this point a change in the oscillator frequency occurs, since the overtone frequency is not an even multiple of the fundamental. An increase in grid current and output on the third harmonic will be noted as capacitor C is tuned. This same circuit may be used on even harmonics, however the crystal continues to oscillate on its fundamental in this case. Thus it can be seen that the "Robert Dollar" circuit will oscillate under a wide variety of conditions and if the tuned circuit L-C is not properly adjusted, overtone operation will not be realized.

With plated overtone crystals the circuit shown in Fig. 3 provides equal or more output under similar conditions than does the circuit in Fig. 1. In this circuit the crystal will operate only on its overtone frequency and depends on the tuning of L-C.



## ONE-DAY PROCESSING

Spot Frequencies 1500 KC to 75 MC

**.01 % TOLERANCE**—Crystals are all of the plated, hermetically sealed type and calibrated to .01% or better of the specified frequency. See specifications below:

*For closer tolerance and commercial applications use the F-6 series crystal. Write for full information.*

### SPECIFICATIONS

**Holders:** Metal, hermetically sealed, available in .093 dia. pins (FA-9) or .050 dia. pins (FA-5).

**Calibration Tolerance:**  $\pm .01\%$  of nominal at 30° C.

**Temperature Range:** -40° C to +70° C.

**Tolerance over temperature range** from frequency at 30° C  $\pm .01\%$ .

**Circuit:** Designed to operate into a load capacitance of 32 mmf on the fundamental between 2000 KC and 15 MC. Designed to operate at anti-resonance on overtone modes into a grid circuit without additional capacitance load. Write for recommended circuits).

Orders for less than five crystals will be processed and shipped in **one working day**.

**HOW TO ORDER**—In order to give the fastest possible services, crystals are sold direct. However, crystals are also available by special order through your local jobber. Where cash accompanies the order, International will prepay the Airmail postage; otherwise shipment will be made C.O.D.

## PRICES

FA-9\* (Pin Diameter .093)\*

FA-5 (Pin Diameter .050)

Pin Spacing .486 (\*FA-9 fits same socket as FT-243)

RANGE	TOLERANCE	PRICE
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1500-1799 KC	.01%	\$4.50
1800-1999 KC	.01%	\$3.90
2000-9999 KC	.01%	\$2.80
10000-15000 KC	.01%	\$3.90
<b>Overtone Crystals</b>		
<i>(for 3rd overtone operation)</i>		
15 MC—29.99 MC	.01%	\$2.80
30 MC—54 MC	.01%	\$3.90
<i>(for 5th overtone operation)</i>		
55 MC—75 MC	.01%	\$4.50

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Constant 25 $\frac{1}{2}$  Megs input resistance.  
0—1.2  $\pm$ 6  $\pm$ 12  $\pm$ 60  $\pm$ 300  $\pm$ 1200 volts.
- ▶ **5 ELECTRONIC OHMMETER RANGES:**  
0—1000—10,000 ohms. 0—1—100—1000 Megs.
- ▶ **6 PLUS and 6 MINUS DC VOLT RANGES:**  
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- ▶ **6 HIGH IMPEDANCE RMS AC VOLT RANGES:**  
0—1—2—6—12—60—300—1200 volts
- ▶ **6 HIGH IMPEDANCE P-P AC VOLT RANGES:**  
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200  $\mu$ A sensitivity  $\pm$ 2% accuracy.
- **1% MULTIPLIERS and SHUNTS.**

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ST-8 60 Kilovolt safety probe. 14.75 net  
ST-1 Snap-on foldaway tilt-stand. 1.00 net

**PRECISION Apparatus Co. Inc.**

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Canada: Atlas Radio Corp., Ltd., 560 King St., W., Toronto, 28

following on: UOC, BDU, DJ, OIR, MQB, NMX, VIS, DPN, DLY, DQF, DRP, HFJ, BOX, DEL, CMW, TTH, BB, BB/1, ZVO, and DUV. QUX now is in Winthrop. 4VVU/mm was heard on 10 meters coming into Boston. CTP is a new ham in Fall River on 40 and 80 meters. UE has a 522 on 2 meters. DDC will be on 2 meters again and has been on 80-meter c.w./phone working DX, F7ER and FA8DA. SX spoke on s.s.b. at the Wellesley Amateur Radio Society meeting. YVE has a Viking Ranger. WN1DOM, Quincy, has an Adventurer transmitter. AAL is now General Class. Traffic: (Feb.) WIEMG 287, UKO 202, IBE 183, EPE 112, WSN 90, LM 79, UE 49, TY 32, AVY 29, NUP 29, BY 21, BB 7, WU 6, TYN 5, AHP 2, ATX 1, HIL 1. (Jan.) W1CLF 18, BGW 10, QLT 10.

**WESTERN MASSACHUSETTS**—SCM, Osborne R. McKeagahan, W1HRV—SEC: RRX. RM: BVR. PAM: QWJ. The WM C.W. Net meets on 3560 kc. Mon. through Sat. at 1900 EST. New SEC is RRX, Holyoke. QWJ and JYH put on a fine demonstration of s.s.b. at the HCRA, Inc., February meeting. The HCRA v.h.f. gang lost to the Hartford boys in the January V.H.F. SS and the payoff held treat dinner was held at Tintis, Agawam, Mar. 4th. After the feed all went to the HCRA meeting for presentation of a gavel to the Hartford Club and enjoyed a fine v.h.f. talk and demonstration by Ed Tilton. The WM C.W. Net has been very active and efficient this winter but is badly in need of representation in Franklin County. Any c.w. men up there? RM BVR is working up a net bulletin, with DVW as associate editor. JYH, KFV, WEF, QWJ, and AJX took part in the New Hampshire QSO Party. AZW has a new NC-88. DQX has a new HRO-60. MNG is OBS on the following schedules: 3870 kc., Wed., 6:30 p.m.; 29.5 Mc.; Tues., 7:45 p.m.; and 145.2 Mc.; Thurs., 7:15 p.m. NLE has a Collins transmitter. JYH has built a set of three 813 finals for a contest rig. AOU passed Gen. Cl. New Novices are WN1CFB, CGJ, CSR, DGJ, DMT, DPZ, and DUP. 4URF/1 is stationed at Fort Devens, living and operating in Fitchburg, and has received WAS certificate and 2nd-class commercial ticket. XYV has 26 countries confirmed. NPL is building all band pi-net 813 final and reports that ICW has a new Telrex short beam. LDE says the 15-meter band acts like 10 "way back when." BH has a new 125A all-band final to follow his 10B on s.s.b. AMI is doing a fine job representing Worcester County on the WM C.W. Net. Traffic: W1UKR 199, HRV 109, BVR 106, SRM 60, MNG 52, WEF 50, DVW 37, RRX 35, AMI 30, ABD 29, WCG 12, HRC 11, WDW 11, VE 10, JYH 8, AJX 5, W4URF/1 5, W1YCU 4, JAH 2, T2EUKJ/W1 1.

**NEW HAMPSHIRE**—SCM, Harold J. Preble, WIHS—SEC: BXU. RM: CRW. PAM: AXL. The Nashua Mike and Key Club held its annual banquet Jan. 22nd. Officers elected for 1955 are UAB, pres.; YVJ, vice-pres.; YJD, secy.; QJH, treas.; NAZ, act. mgr. The 6th Annual New Hampshire QSO Party was a great success with more stations participating than any previous year. AOQ claims high score. TNO has been called to active duty with the Air Forces. PVF is now with the U. S. Army in Korea. VZS has been appointed EC for Cheshire County. CVB has received his Technician Class license. VGX is a freshman at Harvard and is working out of IAF on 20 meters. AIJ, TDJ, and LCD, all the same age with the same birthday, held their third annual party Feb. 24th at the QTH of AIJ. Welcome to Novices DDQ and DDR. The Concord Brass-pounders meet the 1st Thurs. of each month. All amateurs are invited to attend. WBM is making some changes in his station and is off the air temporarily. RCEN c.w. section meets at 1000 Sun. on 3685 kc.; the phone section meets at 1230 Sun. on 3950 kc. All Rockingham County stations are invited to participate in either net. Traffic: (Feb.) W1ARR 127, COC 91, IP 58, PFU 35, CCE 25, POK 14, FZ 13, VZS 12, AIJ 8, HS 8, CDX 6. (Jan.) W1GMH 81.

**RHODE ISLAND**—SCM, Walter B. Hanson, jr., W1KKR—SEC: TQW. RM: BTW. PAM: VXC. Activity seems to have slowed a little this month, but the regulars keep reporting. KCS is pouring 800 watts c.w. on 2 meters and maintaining regular skeds now with New Jersey and Maine. The State has plans for the purchase of considerable new gear, and that will mean increasing activity in c.d. drills this summer. The PRA Dinner Dance is to be held at Johnson's Hummocks on May 14th. VXC is looking for OPS applications. TQW has lined up ten ECs and the framework of an honest-to-goodness emergency net is already a reality. CDV has been the only Rhode Island link with the TCPN and he's looking for a successor when he leaves for duty. It's not too early to think about getting that mobile gear ready for the summer months and even more important for the fall hurricane season. Traffic: W1UTA 95, CDV 46, BNX 34, YKQ 34, VXC 16, ZXA 13.

**VERMONT**—SCM, Robert L. Scott, W1RNA—SEC: SIO. PAM: RPR. RM: OAK. At the time of writing this, there are two bills in the General Assembly of Vermont which are of interest to the hams. (1) H-181. Subject: Television Interference. Information to date leads to the belief that if FCC regs are complied with the stations have nothing to worry about (I hope). (2) H-285. Subject: Special number plates. This was introduced by Mr. Niquette of Winooski and has been referred to the Committee on Highway Traffic, where it still is at this writing. Several hams have requested the above committee to hold a public hear-

(Continued on page 96)



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Before you start working over your battery-powered gear for the outdoor radio activity that will soon be in full swing, stop in and see your Mallory distributor. He is prepared to introduce you to a new Mallory Vibrapack vibrator power supply that you can fit into almost any type of mobile equipment.

So small that it fits into the palm of your hand, this new power supply puts out plenty of wattage. It embodies design principles that Mallory engineers have learned in 25 years' experience in building vibrator operated power supplies for communications equipment. You'll find that our designers have used techniques formerly reserved exclusively for commercial mobile equipment.

Here are some highlights. The same communication-duty, series drive vibrator found in taxi, police and utility two-way transmitters and receivers is used. High stability ceramic capacitors are used in critical parts of the circuit. Heavy gauge steel protective cover and bottom plate snap on and off in an instant, to make replacement of vibrator and rectifier tube a few seconds' work even on field location. When you remove the bottom plate, all wiring

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Special attention has been given to hash filtering in the "A" and "B" power leads. A separate external connection to the rectifier heater saves your battery during standby, and provides instant return to operation.

The Vibrapack has been designed to let you provide whatever low frequency filtering is necessary for your particular equipment... without paying for parts and wiring that you may not need. You can connect the output "as is" to a transmitter or receiver that already has its own filter system. Or, if you want to add a filter to the Vibrapack, the chassis has been punched and space allowed for the installation of a Mallory multi-section FP electrolytic capacitor.

Power ratings are conservative, to assure you of higher efficiency, peak conservation of battery power and long operation between charges.

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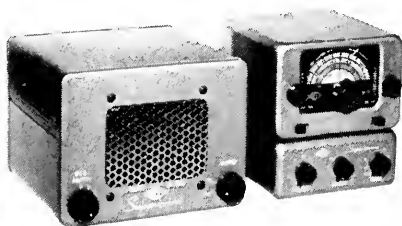
# HOW TO IMPROVE YOUR MOBILE RIG



By Bill Cummings WIRMG

You can always do a better job and get better performance from your mobile rig by keeping up with the latest developments. When the mobile season comes round, the Dale ham staff—including Vinny Scalise W1WEV, Don Onofrio W1TYE, Charles Boynton W1ATT, and myself—start tinkering with the new gear. We can help you sharpen up your reception and work out the bugs with any setup you are now operating. We have the dynamos, filters, receivers, converters, noise clippers, squelches, mounts, loading coils, relays, cable and mikes. Drop in or drop a card, and we'll do our best.

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ing on H-285 so that those interested may appear in its behalf. Traffic: W1OAK 148, AVP 74, RNA 53, IT 27, ZEW 25, BJP 21, TAN 12, FPS 5.

## NORTHWESTERN DIVISION

**IDAHO** — SCM, Alan K. Ross, W7IWU — Caldwell: EYR, the local EC, aided in the search for watermelons for two Portland leukemia patients. His antenna "farm" now consists of one 44-ft. vertical for 75, 40, and 20 meters, a vertical for 15 meters, and a 75-meter folded dipole. Lewiston: IDZ is doing a little 15-meter operation. WN7YBV is getting out of town OK on 80-meter c.w. with the rig borrowed from DTJ. NOG is starting a 2-meter rig. GMC and VIO are rebuilding. Kellogg: RQG asks about the GEM Net and is willing to be NCS. Look on 3638 kc. for the Idaho gang. Gifford: VWS is going strong with DX and has 40 states worked, 30 confirmed, all on 80-, 40-, 20-, and 15-meter c.w. Boise: If we want call letter license plates for Idaho we must start to work on it now for the 1957 legislature. Everyone write to Dean Mayes, MKS, Box 486, Meridian, Idaho, who will spearhead the drive.

**MONTANA** — SCM, Leslie E. Crouter, W7CT — SFK has a new Globe King 500 and is working on plans for the Glacier Park Hamfest to be held at Apgar Camp Ground July 23rd and 24th. RIL has been transferred to Ellensburg, Wash. KUH is NCS for the Montana Weather Net Sun. mornings. MM has a new 20-A on s.s.b. Others on s.s.b. in the Great Falls Area are GCS, YPY, UWN, YLM, and DSS. RRI has moved to Butte and is with the CAA. E-FYN is now KAJ0J. FDH, with the help of JGG, put up a 30-ft. "Pop-can" vertical on the house of FDH on New Year's Day. SWE has a two-element 15-meter beam. NPV needs Asia for WAC on 15 meters. OOH has been appointed chairman of the seventh district YLRL. New calls in Great Falls are YLA, YLC, YLD, and YLM, also WN7YIO and YDY. Recent appointments or endorsements: FDH as OES, BSU as OO, EWR, PAF, and VVU as ECs. The SCM is in the process of moving to Helena and inefficiency can be expected until he is settled in his new quarters. Traffic: (Feb.) W7SFK 71, PCZ 28, EWR 12, CJN 6. (Jan.) W7SFK 82, TKB 21, CJN 8, EWR 8.

**OREGON** — SCM, Edward F. Conyngnam, W7ESJ — SEC: WAT, RM: AJN, PAM; IRZ. ESJ has assumed the duties of SCM, with WAT taking over as SEC. THX is a new EC appointee and has 12 stations lined up for AREC work around the mouth of the Columbia River. ADX is preparing for a big test this spring. A brief AREC test and drill was held in Oregon the first Sun. in February to ascertain the coverage and signal strength. Those participating were AJN, BDU, BVII, ESJ, FIN, LT, LJC, PRA, RNY, SBX, USO, WAT, and WHE. The test will be repeated on the first Sun. of each month at 1100 PST on 3585 kc. The Oregon State Net (OSN), meeting on 3585 kc. at 1830 PST daily, has made rapid gains. Attendance was 202 in 23 sessions. EZR advises that the Rogue Valley Club is now meeting in UGE's school room until the new club house is finished. Steve at GPJ expresses thanks and appreciation for the help received from all amateurs and MARS and ARS members who sent watermelons on his emergency request for two hemophilia victims in the hospital in Portland, Oregon. Traffic: W7APF 533, OKU 138, BLN 96, WAT 70, AJN 64, THX 33, HDN 23, PRA 23, ESJ 16.

**WASHINGTON** — SCM, Victor S. Gish, W7FIX — The Valley Amateur Radio Club (Puyallup) reports its annual election and banquet was held Feb. 18th. New officers are MCU, pres.; GWK, vice-pres.; UZE, secy.; VLC, treas.; SWA, trustee; WN7VZ, sgt. at arms. The Tacoma Amateur Radio Club, Inc., heard a talk on "The Role the Amateur Plays in C.D." given by Tacoma C.D. Director, Frank Evans. RGD reports further that MFG's 1/4-watt handie-talkie was heard in Eatonville; GDW will off the air as mobile temporarily while getting a new Mercury hard-top convertible; OVW was on the air with a Ranger, but the big wind came and took the antenna and chimney down; AZI is NCS of the Tacoma AREC Net the 1st and 3rd Wed. at 8 P.M. on 29.6 Mc.; band practice was held at the QTH of IMB with RGD, RXT, RXS, OVW, KKN, SKR, AEA, and IG attending. The Skagit Amateur Radio Club reports 1955 officers are PQT, pres.; REC, vice-pres.; LVB, secy.-treas. The Skagit AREC Net meets on 50.7 Mc. at 0800 Sat. BA really cut down on traffic by spending half the month in Hawaii. QYN is a new OBS in the Moses Lake Area. EVW reports he is on 40 RTTY, 20 phone, 10 mobile and MARS Nets. TIQ reports AREC activity in Vancouver really is hot with the appointments of RML as EC and RCM as SEC. ETO is contemplating all-band vertical to replace off-center Hertz and keep the antenna in his own yard. FZB and the four jr. operators had chicken pox, which allowed the OM to try out his new Ranger. AVM reports working Olympia on 2 meters but has neither heard nor worked any other 2-meter station. TGO worked (80-meter c.w.) KM6AX, VP9PL, SM8CWC, several ZLs, and YV5BJ. VAZ reports going TDY (temporary duty) in Alabama in March. ZU reports QRM on 14-Mc. phone Sun. mornings on his sked with 7PRZ/2 chased them back to c.w. PHO is working Pacific traffic with a Ranger on 20 meters. AIB is assembling a Ranger. K6BDF/7 is all shook up over the lack of discipline on the local nets. All radio clubs Wash-

(Continued on page 98)

FOR "40"

## 2 Element, 40 Meter MOSLEY VEST POCKET BEAM

- ★ Pretuned to 3 frequencies in 7 Mc. band!
- ★ 5 Db., or more, forward gain over reference dipole!
- ★ 19 Db. front-to-back ratio!
- ★ 1.1/1 SWR at resonant frequency!
- ★ Factory made coils wound on ceramic forms with weather-proof covers will handle full KW!
- ★ Link inductance matches 52 ohm co-ax line!

Real 40 Meter DX and effortless *solid* QSO's are yours with the MOSLEY 40 Meter "V-P" Beam Antenna!

Developed from the tried and proven *Original Design* MOSLEY 20 Meter Vest Pocket Beam, the Model VPA40-2, for the first time, provides outstanding 40 Meter beam performance ... at low cost and with an array of convenient size and weight!

### SPECIFICATIONS

- 14'10" Tubular Steel Boom with factory welded element support plates.
- 36'1 $\frac{3}{4}$ " Maximum Element Length. (61S-T6 alum. alloy.)
- 68 lbs. Assembled Weight.
- Element Sections and Element Supports pre-cut, pre-drilled for fast assembly.
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MODEL VPA40-2, MOSLEY 2 Element 40 Meter "V-P" Beam, less 52 ohm coax line, rator and mast.

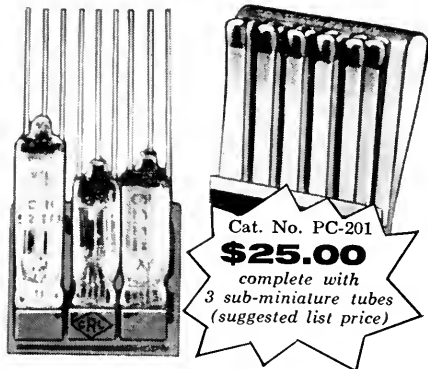
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ington section: Please submit a nomination for EC if your club does not at present have one. Traffic: (Feb.) W7PGY 886, BA 825, FRU 727, VAZ 563, K7FAE 333, W7PHO 207, FIX 81, UYL 51, K6BDF 7 50, W7KT 49, APS 46, KUS 46, USO 32, EHH 29, RXH 24, FWD 21, PQT 17, AIB 14, HKA 12, GVV 10, GAT 7, LVB 6, ETO 5, AVM 4, TGO 4, ZU 4, EVW 3, FZB 2. (Jan.) W7VCF 21.

### PACIFIC DIVISION

**HAWAII** — SCM, Samuel H. Lewbel, KH6AED — On Feb. 28th a big volcanic eruption started. YI, 3 3/4 miles from the spot, alerted the Hilo hams. AFQ, AFS, AXQ, ATT, AQE, IN, GP, AU, AUP, AYQ, AZL, and BFQ set up the net between Pahoa and Hilo. AED set up the C.D. Net with AUJ, OS, ANX, BEH, AN, AAI, and DE manning the Honolulu end for traffic to c.d. headquarters. The Hilo-Pahoa Net operated 24 hours a day from the start and at report deadline, 7 days later, was still working. All other hams in the Islands are to be commended for the way they kept the frequencies clear. Now that you have seen how an organized net can step in and handle a rush situation let's have your applications for AREC membership. I am also looking for applicants for OBS, OPS, ORS, and OO appointments. The 49th State Net reorganized in Feb., AGB is NCS. The Net meets Wed. and Fri. at 1645 HST and Sun. at 1300 on 7290 kc. with outlets for traffic on all Islands. Traffic: (Feb.) KA2GE 882, AK 712, HQ 139. (Jan.) KA7LJ 1025.

**NEVADA** — SCM, Ray T. Warner, W7JU — ECs: PEW, PRM, TVF, TJY, and ZT. OPS: JUO and UPS. ORS: MYP, PEW, and VIU. OBS: BVZ. Nevada State Frequencies: Phone, 3880 and 7268 kc.; c.w., 3660 and 7110 kc. Old-Timer ex-SCNC blossoms out with a new call, YRY, and a show of activity in Boulder City. K6BJ is expected to give another lecture, this time on VFO Construction and Single Sideband, at the Water and Power Hall in Boulder City, June 2nd. LGS is active from his new QTH in Reno. UPS, in Elko, completed his new three-element 20-meter beam. JU is preparing for some 6-meter activity with a rebuilt Channel 2 TV Yagi. SXD confines his 40-meter activities to the early morning hours. SNP, Virginia, keeps her Viking busy on all bands from 15 to 75 meters. TVF is sniping for 100 Nevada QSLs! Write to BJY if you are interested in the "Worked 25 Nevada" certificate.

**SANTA CLARA VALLEY** — SCM, R. Paul Tibbs, W6WGO — SEC: NVO. Ed Turner has just been appointed SEC and is busy organizing the section. Any club which has not been contacted and has any suggestions to make about its area and AREC problems should drop Ed a line at 2837 Fernwood Ave., San Mateo. AIT is active in traffic and will be break-in operation soon with the new system just completed. YHM got a BPL medallion for making BPL three times. EDC is building an amplifier for use on 420 Mc. using a 4X150. The San Mateo Radio Club Hamfest will be held on June 5th this year. Further details will be announced later. This column was in error some time back and it corrects this by saying that the San Mateo Club elected NUI, pres.; and QOY, vice-pres.; MIKI was named EC for the San Mateo Area. WLI is having fun on 144 Mc. and reports only two new countries were worked in this year's DX Contest. The larger the total the harder new ones come. Norm. NX is having a Collins KW-1 converted to single sideband. We advise everyone to remove the antenna coils from the receiver when Frank opens up now. The SCCARA reports there have been no new cases of TVI for some time now. The code and theory classes started in February by the SCCARA are well attended. Classes are guided by VZT and AVJ. The c.w. nets still need more c.w. operators to share the work in traffic-handling. The more of you checking into these nets the more the work can be spread around. Everyone is welcome to check in. Traffic: W4YIP/6 816, W6YHM 520, K6BBD 178, W6HC 83, AIT 18, K6BAM 6.

**EAST BAY** — SCM, Guy Black, W6RLB — Asst. SCMs: Oliver Nelson, 6MXQ for v.h.f.; and Harry Cameron, 6RVC, for TVI. SEC: Jay Amaro, WGM, 199 Harrier Street, Vallejo, EC: Les Broliar, K6EER, 1511 Laurel Ave., Richmond; J. Wayne Clarke, 770 Hoffman Ave., Napa.; Walt Stangel, FLT, Clearland Highlands; Les Sweitzer, ZZF, 121 Morningside Rd., Vallejo; Maj. Allan C. Forbes, K6GK, 4107 Brookdale Ave., Oakland; A. V. Wright, QDE, 660 38th St., Richmond. If you are not in touch with the EC who lives nearest to you, get in touch with him direct, or contact the SEC. Remember, 100 per cent amateur participation in AREC is the ultimate goal. You would pitch in and help in a real emergency, wouldn't you? Then why not say so by joining the AREC. We now have a third RM in the East Bay section, Ralph Hall, EFD, who needs no introduction to traffic men. One of Ralph's other activities has been sharing the load of sending out code practice over JZ when Ray has been away. The other two RMs, IPW and JOH, have wanted Ralph to join them for a long time. K6WAY keeps skeds with K5FKF, KL7FAF, KL7AIR, KH6AJF, and KA2JW besides regular MARS nets. K6CCQ now has 41 states with his 60 watts to an 807. ITI reports a kw. s.s.b. rig under way. IIBF and K6EPC have been appointed ORS on recommendations of the RMs. The v.h.f. gang really started making plans for 6 meters as soon as the word on the Technician privilege there was

(Continued on page 100)

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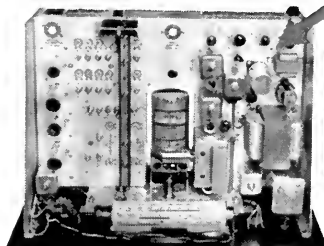
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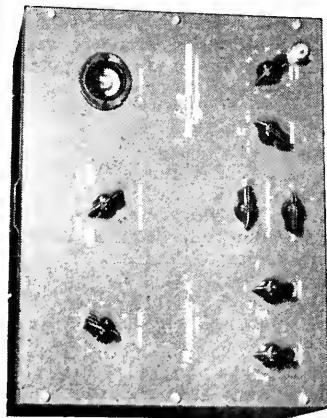


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received. The Oakland Radio Club heard EFT on RTTY and other Robert Dollar equipment. Prof. Lester Reukema, of the University of California, talked to the East Bay Radio Club on atomic energy. VSV talked to the SARO on 2-meter antennas. JHV moved to Castro Valley. A new active member of the 2-meter gang is NCL. ACN is hard at work at the license plate bill. Are you supporting him? PCN is the new editor of the *CCRC Calendar*. Her QTH is San Francisco. Because I have moved out of the East Bay section, to 281 Loucks Ave., Los Altos, I have resigned as SCM. However, I will continue to serve as Acting SCM until an election can be held, so for the time being send your reports to my Los Altos QTH. Traffic: K6WAY 858, FDG 522, W6IPW 152, K6GK 88, W6EFD 50, HBF 15, ITH 11, K6CCQ 4.

**SAN FRANCISCO** — SCM, Walter A. Buckley, W6GGC — The Humboldt Radio Club members are helping 14-year-old Linda Harvey (who is confined in a wheelchair because of polio) to obtain her ticket. They also are preparing the rig for her to go on the air. JSY won the Club's "California Counties Contest" (worked 43 counties). The Mt. Tamalpais Radio Club held its annual dinner at "Tommie's Place" in Novato. CDF gave a very informative talk on single sideband. YME, a technical director, will talk on the opposing side at the next meeting. K. D. Wilson received a certificate for working all California counties. HAMS still is on 2 meters but has 10 stations checking in on 6 meters each Sun. night. URA is NCS. The S.F. Naval Shipyard Club members have agreed to join HAMS on Field Day and also have invited the HAMS to join them in their annual dinner sometime in April. Membership in the SF Naval Shipyard has been opened to outsiders. Newcomers will not be allowed into the shipyard proper for the meeting night but can attend the other meeting, which is held in Red Cross Bldg. LOU, of the Sonoma County Radio Club, reports that he is busily working on plans for the Mission Trail Roundup which will be held in El Verano on June 18th. CBE, of the Larkspur Radio Club, says he worked 31 counties on 'phone the first week end. The Cathy Radio Club acted as host to the SCM at the February meeting and treated him royally in Chinatown after the meeting. The San Francisco Radio Club had John F. Honey, of the Stanford Research Institute, as guest speaker in February. He spoke on single sideband. ATO has been doing a fine job on the speakers committee and has excellent features lined up for future meetings. The Club presented GGC with a beautiful plaque. Thanks again, gang. The Ladies Club SF combined a meeting night with a baby shower for PIR. BIP was appointed chairman for the San Francisco Club Field Day activities. The 29ers Club had 17 cars with about 50 passengers at its February hidden transmitter hunt. GCV and PCN are planning a new QTH soon. DEK is back on the air after receiver troubles. K6HEZ is mobile on 6 meters. MXV is playing around with an 813. K6BJO, W6LL, JWF, GHL, K6GPX, EKF, and GGC all attended the Wasco Whing-ding Feb. 26-27. Seventy-two amateurs were there. The License Plate Committee reports that more than 300 dollars was spent on sending out literature on Senate Bill #222 and Assembly Bill #593. ACN was appointed by the Central California Radio Clubs to represent them as lobbyist at the legislature. To date a clause has been added to the original bill; that special plates are to be awarded to amateurs with mobile installations only. The California Motor Vehicle Dept. reports that the lists sent to law representatives in California cost \$75 per copy. If the bill is made permanent at this session there is hope of lowering the \$3.00 extra fee. Traffic: W6SWP 1111, GQY 234, QMO 160, GGC 26, YC 16, CBE 6, GQA 3.

**SACRAMENTO VALLEY** — SCM, Harold L. Lucero, W6JDN — The Dunsuir Amateur Radio Club elected new officers as follows: JDN, pres.; K6IVD, vice-pres.; W6IOM, secy.-treas., K6BJO, act. mgr. IVD also is EC. KTB is EC for the Yreka Area. C.d. is taking form in Siskiyou County and all towns now have an EC. The Siskiyou County AREC Net meets each Sun. at 0900. K6CFZ reports new hams in Colusa are KN6IRZ, GNJ, and IUT. K6BJV is in RACES. Colusa will be the relay point during the boat races. Stockton to Redding. K6ER is doing fine work as OO. FYK still is on 2, 6, and 440 Mc. K6BYS is EC for the Chico Area. There will be a ham get-together at Ruth, Calif., July 3-4. New officers of the Golden Empire Radio Society are MWR, pres.; IINL, vice-pres.; K6BMU, secy.; K6BSY, act. mgr. The Club has an Instructograph code machine to be loaned to radio aspirants. The Club's call is RHC, a memorial to Nola Dixon who joined the Silent Keys some time ago. MWR has re-enlisted for another four-year hitch and volunteered for another year as NVRES station-keeper in Chico. The Sacramento Council of Amateur Radio Clubs would like to have representatives from all clubs attend its meetings. The license plate bill is up during this session of the State Legislation. We hope that it becomes a law. All amateurs should write their State Senator and their Assemblyman and state their wishes. Traffic: W6OPY 33, MWR 20, JDN 5.

**SAN JOAQUIN VALLEY** — SCM, Edward L. Bewley, W6GIW — SEC: EBL. RM: K6BGM. PAMS: ZRJ and WJF. The Central Valley Amateur Radio Council meeting was held in Merced, with representatives from Stockton, Turlock, Merced, and Coalinga attending. Also present

(Continued on page 102)

Now -- 2 Pre-Tuned Beams on ONE BOOM

# MULTIBAND

# SHORTBEAM

TRADE  
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For All  
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**20-10**  
**20-15**  
**15-10**  
**40-20**

	20 — 10	20 — 15	15 — 10	40 — 20
No. of Elements	3 El. "Shortbeam" on 20 3 El. Full Size on 10	3 El. "Shortbeam" on 20 3 El. "Shortbeam" on 15	3 El. "Shortbeam" on 15 3 El. Full Size on 10	2 El. "Shortbeam" on 40 2 El. Full Size on 20
Boom Length	16 Feet	16 Feet	12 Feet	12 Feet
Longest Element Length	16 Feet on 20 16 Feet on 10	16 Feet on 20 13 Feet on 15	13 Feet on 15 16 Feet on 10	33 Feet on 40 33 Feet on 20
Forward gain reference to full size dipole	4.8 db on 20 8.8 db on 10	4.8 db on 20 4.8 db on 15	4.8 db on 15 8.8 db on 10	4.4 db on 40 5.6 db on 20
Front to Back Ratio	20 db on 20 25 db on 10	20 db on 20 20 db on 15	20 db on 15 25 db on 10	15 db on 40 20 db on 20
Approx. Weight	30 lbs.	35 lbs.	28 lbs.	48 lbs.
Impedance match	52 ohms on both bands	52 ohms on both bands	52 ohms on both bands	52 ohms on both bands
Element Construction	61ST6 7/8"-3/4" dia. Alum. both bands	61ST6 7/8"-3/4" dia. Alum. both bands	61ST6 7/8"-3/4" dia. Alum. both bands	61ST6 1 1/4"-1 1/8" dia. Alum. both bands
Amateur Net	<b>\$97.50</b>	<b>\$107.50</b>	<b>\$94.50</b>	<b>\$127.50</b>

NOW the amateur who wishes to go on any combination of 10, 15, 20 and 40 meters can do so without employing large and expensive mass installations. This newest R. S. MULTIBAND SHORTBEAM assures you of high performance on any combination of

these bands. All coils enclosed in weather-proof bakelite containers and wound with #12 Formvar wire. Will handle power up to 1 Kw. and operate with one T.V. rotator. All beams pre-tuned to bond centers. SWR at resonant frequency below 1.1:1.

## Complete Line of Ready To Use Pre-Tuned Shortbeams

20 meter 2 element.....\$49.95  
20 meter 3 element..... 59.95  
15 meter 2 element..... 44.95  
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40 meter 2 element.....\$74.95  
40/80 meter shortdoublet coils, (Per pair per band)  
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## PL-55 PLUG AND CORD

Standard plug with 6 ft. rubber,  
2-wire cord with spade

lugs.....**55¢**



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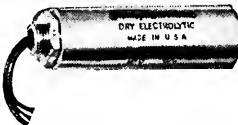
200 ohms D.C. resistance choke.  
2 1/4" wide, 2" high, 2 1/2"

mounting centers.....**95¢**

15 H. 50 Ma.....**49¢**

## LIMITED QUANTITY

"CQ-1" Transistor with instructions.....	<b>\$ 2.50</b>
4D32 tubes, Brand new.....	<b>19.95</b>
Coax angle plug.....	<b>.45</b>
3-conductor Coiled Cord, 6 ft. extended.....	<b>1.79</b>
4-prong statite socket.....	<b>.15</b>
110V. relay, DPST 20 Amp contacts.....	<b>3.95</b>



Triple 8 mfd. 450 V. electrolytic upright can condenser, separate negatives, all leads insulated from can. Nationally known mfr. Reg. dealer net \$2.58.....**59¢**

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For break-in operation on CW, AM, or SSSC. Use one antenna for transmitting and receiving. It's instantaneous! No moving parts, no power needed to operate. Coax fitting for connections to feeder and receiver. Will handle 1 Kw. With 75 meter plug-in coil...**\$9.95**

40, 20 meter coils, **\$1.75** each



## 8/8/8 MFD.

## 500 V. D.C.

Triple 8 mfd. 500 working volt D.C. oil-filled condenser, common negative, solder terminals, hermetically sealed, 5" x 3 3/4" x 2 1/4".....**\$1.95**



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were FYM, Central California Council president, and ACN, license plate committee. Major results of the meeting were planning unified action of FVI committees and the suggested endorsement of ACN as representative of the clubs for the license plate bill. ZNL has been appointed temporary chairman of the Council. The Sonoma group has officially formed a club and named it the Tuolumne Amateur Radio Society with EBL, pres., and PCB, secy-treas. The Bakersfield Club has, as the communication reserve, acquired two Viking Rangers, an NC-183D, a BC-221, and four beams with rotators. K6EKS is in New York with the IBM Co. JLL is active on 160 meters and is looking for QSOs. OYF is quite ill in St. Joseph's Hospital, Stockton. FIP and RLG are back on 2 meters. NQC passed the 2nd-class commercial test. OVR was NCS of SJCEM for February. KN6GTA was Maritime Mobile on 2 meters. New officers of the Fresno Club are UJU, pres.; QOS, vice-pres.; ONK, secy. The Fresno Club has received official approval of the Pacific Division Convention to be held in Fresno May 21st and 22nd. JPU is working on an ART-13 for RTTY. ZOI and BFH are going s.s.b. A group of Fresno v.h.f. men are building a 2-meter repeater station for the hills east of Fresno. Traffic: W6FEA 141, K6EVM 74, W6ADB 70, SNF 44, EBL 21, SJJ 10, WJF 8.

## ROANOKE DIVISION

**NORTH CAROLINA** — SCM, Charles H. Brydges, W4WXX — SEC: ZG, RM: VHH, PAM: ONM, OO: SOD. If you are interested in Section Net activities, join the Tarheel Emergency Net on 3865 kc. That is your ARRL Section Net and will be only as good as you make it. EIV has a new 75-A-3 and a Globe King. It sure is unusual to hear Howard not mobile. The Raleigh gang sure has been doing some hard work on the license plate bill. Show your appreciation by giving your hearty thanks. Lots of 2-meter activity is popping up everywhere. Let's hear from some of your guys on OES appointments. New stations in Charlotte are KN4BVJ and K4BZL. BZI is ex-5EWQ and is sales manager for WWOX. ZQB is moving to a new place to get a little more room for his Dixie Half Gallon. GKG has thoughts of rebuilding his 304-TL final. All who are seriously interested in forming a North Carolina phone traffic net on Saturday, please drop me a line. The Gastonia group has a monthly paper called *GAB (Gastonia Amateur Bulletin)*. It is packed full of excellent information on local happenings and may be a good idea for other clubs or groups over the State. DF has a new 20-meter beam and has been working DX. Traffic: W4RRH 25, ONM 11, BUA 4.

**SOUTH CAROLINA** — SCM, T. Hunter Wood, W4ANK — The Aiken Club has elected new officers: WSD, pres.; EQD, secy-treas.; ZVY, act. dir.; and AYD, pub. ZVY demonstrated the antenna 'scope and GDO at the February meeting. FM is building an SS rig. LXX has a new trailer with more room for a ham shack. FGX is QSY to W2-Land. SMI reports good 10-meter DX. AUL is working DX on 20 meters. TSU has a new beam on 20 meters. ULH is to be congratulated for his assistance to newcomers in Florence. WN4HOZ reports two new KNs in Greenville: BWZ and BXA. WN4HOZ has worked 42 states with a 32-foot vertical on 40 meters. TTG reports his XYL is now KN4BXH and is looking for South Carolina contacts on 3736 kc. We hear that SOF, of Dillon, is secy-treas. of the Lumberton Club. SOD is a member of the Lumberton Club, which boasts of 20 charter members. New Greenville Club officers are ASD, pres.; VUU, vice-pres.; K4AIB, secy-treas.; NJG, act. mgr.; FNS, trustee. The Greenville Club has secured the old control tower at the airport as a club house and the club station, NYK, will be on the air from this location soon. The Club boasts of 15 mobiles with 6 on 75 meters and 7 on other bands. Thanks to Virginia for the nice report. ZRH transmits code practice at 1900 EST on 3700 nightly Mon. through Fri. The South Carolina C.W. Net meets Mon.-Fri. on 3525 kc. at 1900 EST. Traffic: W4HDR 265, AKC 198, ZIZ 158, FFH 66, RPV 56, F4IL 36, ANK 25, YAA 10, FM 3.

**VIRGINIA** — SCM, John Carl Morgan, W4KX — SEC: RTV. By the time this appears, KX will have moved to Fredericksburg. See page 6 for new address. Others on the move include YS to DL4, VUF to North Carolina, CGE and YKB on a 3-week Navy cruise, LK abroad for 3 months. RTV holds a meeting of ECs each Sun. at 0800 on 3835 kc. and has appointed ZCL as his assistant in charge of c.w. AREC operations. New ORS: AAD, WYC. New OPS: RGZ, CWB. New OO: EUH. Appointees are required to suggest other likely candidates for appointments. Or if you want one, just ask. Don't be bashful. VPO and his XYL, HLF, are teaching a code class of about 20 in Orange. YE's 11-year-old son now is WN4CAX, making three hams in the family. Big brother is YZC. KAO has mobile working on all bands, while YVG says he's doing pretty well scrounging parts for one. BYZ has a new Globe Scout. KWP reports an emergency net in formation among the C. & O. Ry. employees who are hams. KFC worked T19MHB on 40, 80, and 160 meters for country No. 225. Among the Virginia gang at the banquet of "Ozone Sniffers" (old-timers) at Olney, Md. in February were AKN, KFC, KX, EBH, and NV. KN4ASU, radio instructor at Norfolk Naval Base, shucked the "N." TFZ is looking for volunteers

(Continued on page 104)

# ANNOUNCING THE NEW



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(For Amateur Use)

Fundamental operation to 30,000 KC. Available for 15 meters, 11 meters, and 10 meters; also for model control on 27.255 MC.

### Up to 2 Watts Output From Oscillator

This crystal is designed to operate in a special circuit. A copy of the circuit is shipped with each crystal, and should be used as shown. Any change in the circuit may cause damage to the crystal and void the guarantee.

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FREQUENCY RANGE	PRICE
21000 KC to 21450 KC	} \$4.75
26900 KC to 27230 KC	
28000 KC to 29700 KC	
27.253 MC	\$4.75

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## 2-Meter Beam Kits

GOTHAM proudly presents a 6 element Yagi beam for 2 meters at only \$9.95. Contains a 12 foot boom, 1" alum. tubing;  $\frac{3}{8}$ " alum. tubing for elements; Amphenol fittings; all hardware, and instructions. Vertical or horizontal polarization, terrific performance!

And GOTHAM'S new 12 element Yagi for 2 meters at only \$16.95! Contains a 12 foot boom, 1" alum. alloy tubing;  $\frac{3}{8}$ " tubing for elements; all Amphenol fittings; all hardware, and instructions. Vertical or horizontal polarization, multiplies your power by 32.

## 10 M. BEAMS

**S103T • Std. 10m 3-E1. T match, \$18.95.** 1—8' Boom,  $\frac{3}{8}$ " Alum. Tubing; 3—6' Center Elements,  $\frac{3}{8}$ " Alum. Tubing; 6—6' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

**D103T • DeLuxe 10m 3-E1. T match, \$25.95.** 1—8' Boom, 1" Alum. Tubing; 3—6' Center Elements,  $\frac{3}{8}$ " Alum. Tubing; 6—6' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

## 15 M. BEAMS

**S152T • Std. 15m 2-E1. T match, \$22.95.** 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements,  $\frac{3}{8}$ " Alum. Tubing; 2—8' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 2—7' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

**D153T • DeLuxe 15m 3-E1. T match, \$39.95.** 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 2—8' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 2—6' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 2—7' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 1—T Match (6'), Polystyrene Tubing; 1—Beam Mount.

## 20 M. BEAMS

**S202N • Std. 20m 2-E1. (No T), \$21.95.** 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 1—Beam Mount.

**S202T • Std. 20m 2-E1. T match, \$24.95.** 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Mount.

**D202N • DeLuxe 20m 2-E1. (No T), \$31.95.** 2—12' Booms, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

**D202T • DeLuxe 20m 2-E1. T match, \$34.95.** 2—12' Booms, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Crosspiece, 1" Alum. Tubing; 1—Beam Mount.

**S203N • Std. 20m 3-E1. (No T), \$34.95.** 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 1—Beam Mount.

**S203T • Std. 20m 3-E1. T match, \$37.95.** 1—12' Boom, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Mount.

**D203N • DeLuxe 20m 3-E1. (No T), \$46.95.** 2—12' Booms, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 1—Beam Mount.

**D203T • DeLuxe 20m 3-E1. T match, \$49.95.** 2—12' Booms, 1" Alum. Tubing; 3—12' Center Elements, 1" Alum. Tubing; 6—12' End Inserts,  $\frac{3}{8}$ " Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Mount.

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for ODN NCS. When you read this, the summer slump will be imminent. But this is an excellent time for the newer hams to get their hand in, in net operation, especially the c.w. nets. Get in touch with RMs TVO, PXA, or YZC if interested. We suggest you take a try at NCS—you'll find it's a lot of fun and quite easy when you get the hang of it. Anyone capable of 20 w.p.m. or better is a natural. Finally, we urge you to report any activity or traffic to the SCM each month. Regular reporting cards are available on request. Traffic: WPFCC 894, BLR 166, KX 73, YZC 71, YVG 38, TFZ 36, CFV 25, KFC 20, ASU 19, PPI 14, IA 12, AAD 11, JAU 10, CWB 6, LK 5, WYC 5, RGZ 4, BYZ 3, LW 3, CGE 2, TFX 2.

**WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—SEC: YPR, PAMs: FGL and GCZ. RMs: DFC, GBF, HZA, and JWX.** GBF has been doing good frequency-measuring work. CHP has a new Globe King. PRM is active in Bridgeport on s.s.b. and c.w. He is ex-operator from DL4AIR. ORD is on s.s.b. with 300 watts and is building kw. linear amplifier. IWB had a good article on mobile signal-strength meter in March QST. LBT is on 15-meter mobile. PQQ has a new kw. amplifier on 15 meters. GEP informs me that Princeton Club is planning another picnic-hamfest in June. UYR has a new vertical on 80 meters. TMI, in Nitro, is ex-4PHR. He is building a 100-watt linear. IXG has a new HX-129X. GBF and JWX sure did a bang-up job this month. The Tri-State Club in Huntington is very active on 6 meters. VCT is back in Texas for a short spell. ZJS is planning s.s.b. gear. LSG is planning on getting a high-power rig soon. AVW is back on and is getting a new two-element 20-meter beam. LS is doing a lot of mobile work. EOD has the s.s.b. job finished. Thanks to NLT, LS, WSL, and NRG for their tremendous help in working on the license plate bill. The hams in this section responded very well in sending in letters and messages to the Delegates and Senators. Traffic: WSCBF 642, JWX 410, GEP 84, HZA 61, IXG 19, DFC 11, LBT 7, PQQ 3, UYR 3.

## ROCKY MOUNTAIN DIVISION

**COLORADO—Karl Brueggeman, W0CDX—SEC: MMT, RM: KQD, PAM: IUF.** We now have about 1100 hams in Colorado with only 220 AREC members. There is lots of room for improvement so let's all join and see how close we can come to 100 per cent. MMT or your SCM will be very happy to send out applications, so just send either one of us a post card, and we will answer promptly. Also remember the EC check-in around the first of the month. OMN has finished this year's radio class and has three ready for Novice Class examinations. Ben will conduct a similar class next fall. WN0ZZS and KN6AAI are two new Novices from Pueblo, IUF has a new final, TVI has 41 states toward WAS, including W1AW. The Colorado nets have been having a lot of trouble lately with QRM. Most of it seems to come from hams who do not check their frequency before transmitting. Net operation is very important and can be done efficiently only if all of us cooperate. The news was quite sparse this month and as a result this week's net, Traffic: K0WBB 821, W0KQD 398, W6PKL/0 262, W0TVI 73, PGN 61, LNH 47, IA 10 IUF 3.

**UTAH—SCM, Floyd L. Hinshaw, W7UTM—The Utah license call bill has passed the House. By the time you read this it is hoped the bill will have become law! TCC expects to be back in Utah to participate in the April CID Party. JPN still is busy with defense activities and is not on the air as much as he would like. Hal is sparking the 2-meter activity in this Area. Ogden news: SAZ says that OXC has gained membership in the c.d. net. RQT has toaster interference (TIT). Hi. VHS is looking for 6-meter openings. MWR made BPL on originations plus deliveries. Traffic: (Feb.) W7MWR 242, UTM 7, (Jan.) W7JPN 6.**

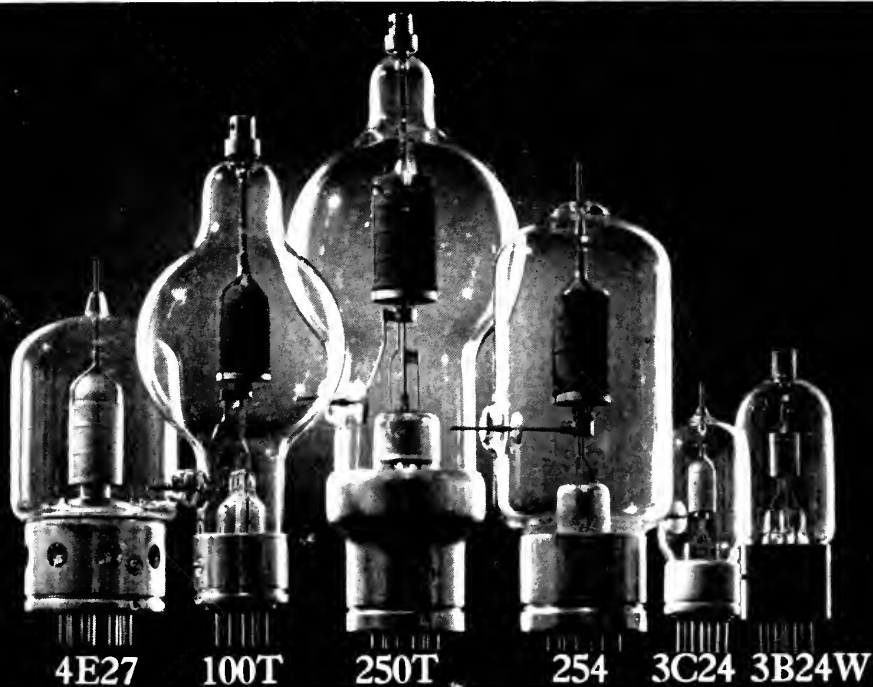
**WYOMING—SCM, Wallace J. Ritter, W7PKX—**Sorry to report the failure of the Wyoming License Plate Bill S-41 to pass the House Committee. The Casper Radio Club had a very successful booth at the hobby show. The Sheridan Radio Club is starting on mobile 2-meter c.d. rigs and is getting started on RACES set-up. HLA, in a new home, should have an antenna up soon. WET is rebuilding the all-band rig. JJO was elected secretary of the Cheyenne Club and is sporting a new Ranger. SQT would like to start a 7-Mc. Wyoming Net. Two new ones at Cheyenne are WN7YVW and WN7YWW. POA, OZP, and BJS transferred out of Cheyenne. EUZ is very lonesome on 2 meters, all fired up with no one to QSO. Wyoming now has a c.w. net, known as the "YO" Net, in operation on 3610 kc. Mon., Wed., and Fri. at 1830 MST, with DXV acting net control. PKX is going on vacation to XE-Land. Traffic: W7PKX 260, DXV 65, HDS 36, MNW 20, PMH 6, XVX 2.

## SOUTHEASTERN DIVISION

**ALABAMA—SCM, Joe A. Shannon, W4MI—SEC: TKL, RM: KIX, PAM: RNK.** Section nets: AENB, daily at 1900 on 3575 kc.; AENP daily at 1800 on 3955 kc.; AENB C.W. operates at a speed of 15 w.p.m. on Sat. and Sun. and welcomes newcomers. Four stalwarts hit the BPL trail in February: K4FDY, W4COU, HKK, and UHA.

(Continued on page 106)

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COU is experimenting with a Franklin Oscillator. ZSQ was voted the most efficient NCS on AENP for February, and RTQ the outstanding net member for the month. WOG has moved to a new location and FAJ is now living in Coral Gables, Fla. ZWE is signing portable from York. After four tries at 'phone patches, ZSQ says he can now offer his services in Birmingham! Welcome to KN4ASG, Winfield, and KN4CCI, Anniston. TKL has a new Chevie and the job of converting mobile to 12 volts and reinstalling. CAH says he has worked VP5AE, Grand Turks Island, on 15 meters! RLG is back in the traffic column after a year's absence. Traffic: K4FDY 1158, W4COU 602, HKK 516, UHA 449, YRO 69, EJZ 60, WOG 59, ZSQ 52, KIX 48, K4ACO 27, W4ZSH 26, OAO 24, TKL 24, YAI 24, RNX 21, BFM 14, CEF 14, PWS 14, TXO 14, HYI 12, DXB 10, JKU 6, CAH 4, OR 4, RLG 4, USM 2, USM 2.

**EASTERN FLORIDA** — SCM, John W. Hollister, jr., W4FWZ — Our SEC, 1M, is planning on May 15th for JOCO. A nice report was received from PJU on the LJM transmitter fund. The B&W 5100 was delivered Feb. 27th and set up by DPD, DDW, CPG, and VIE. Because TOJ was listening, a dying child in Oregon received her wish to taste some Florida watermelon via Eastern Air. The three foregoing disassociated ham activities certainly point up our belief in our hobby and my belief in the amateur. Ye SCM got first-hand information on some good things in store for those heading for St. Petersburg in June for the ARRL Convention. An enjoyable evening was spent at the SPARC meeting. Ft. Lauderdale: The Flamingos are aiming to please the gals in their outings this year. Bird Sparks: VGT is building a new shack. TOJ uses an SX-88 with a Globe King and TOK uses the NC-183. WAQ uses B&W 5100 and s.s.b. on 20 meters with Telrex two-element Mini. Thanks to SDI/MVR for the TOJ-Oregon story. KN4BXR is 15. WN4HRU is NCS for 3735-ke. Novice division of Broward Emergency Net, Gainesville: TJU reports new GAS officers are K4AQR, TJU, WEM, WEM, the EC, has 7 mobiles in the GAS Net. TJU says the gang is getting polished up for Field Day (June 25-26). Jacksonville: CNC reports NEK has nice skeds, so drop him a line. Key West: We are sorry DRT is moving on. ELS says club station K4NCN now has the beam up. Miami: Thanks to IYT and PBS for the honorary DEN certificate. PBS and IYT report the DEN drill of Feb. 28th was a big success with 11 mobiles. Key men included PBS, YCL, UIW, CUR, and IYT. Renewed 144-Mc. activity brought in FLH with 600-watt duplex with KQG and ZDR. RNV also is on 144 Mc. CUR says AZO is on 144 Mc. with 500 watts and reports a new club, the South Miami Radio Club. YJE uses B&W 5100. Orlando: BMY is building a new shack and console. Tampa: 2JWJ swears by his rhombic. Norm says KL7AWH died in Clearwater. Traffic: (Feb.) W4TYE 679, IYT 585, PJU 526, LAP 340, DVR 262, WEO 190, WS 123, WHK 103, ELS 79, YJE 65, TJU 54, FSS 40, LMT 34, ZIR 32, K4ANJ 27, W4RWN 27, FJE 20, IM 14, FWZ 12, NEK 12, YOX 12, DES 5, BWR 4, YNM 2, DRT 1. (Nov.) W4PJU 524.

**WESTERN FLORIDA** — SCM, Edward J. Collins, W4MS/RE — SEC: PLE. ECs: HIZ and MFY. CQX sends an FB report on the Novice program. New Novices are KN4s BMQ, BNA, BKP, BRQ, BQY, BKU, and BKW. 9CPI now is K4BZX. CQX is coming on with a kw. MUX has been burning up 75 meters. KWM rebuilt the kw. rig for 20 meters. RKH and PLE are cleaning up TVI in their rigs. ROM has a new 10-meter rig. SMM has the new mobile rig going. UXW is on 10-meter mobile. WKQ is getting all set for Field Day. PLE is looking for ECs for the central and eastern parts of this section. HQG is a traffic man on 75 meters. BGG has a car and is dreaming of mobile gear. MS has a new B&W but KN4AGM claims it. HI. QK has the 813s booming on 75 meters. UCY is after higher power. NJB is on again. JPD swears by the 40-meter band. TTM is very active in the YLRL. KN4ADY is getting the rig set to come on the air. 6UQZ is in the area again after 18 years. VR keeps 40 meters going along with ANP. OOW is renewing his ticket. RZV is faithful to the Dagwood Net. UCY is happy over the 10-meter openings. YFF, YFG, and YFH have antenna problems. Traffic: K4AKP 341.

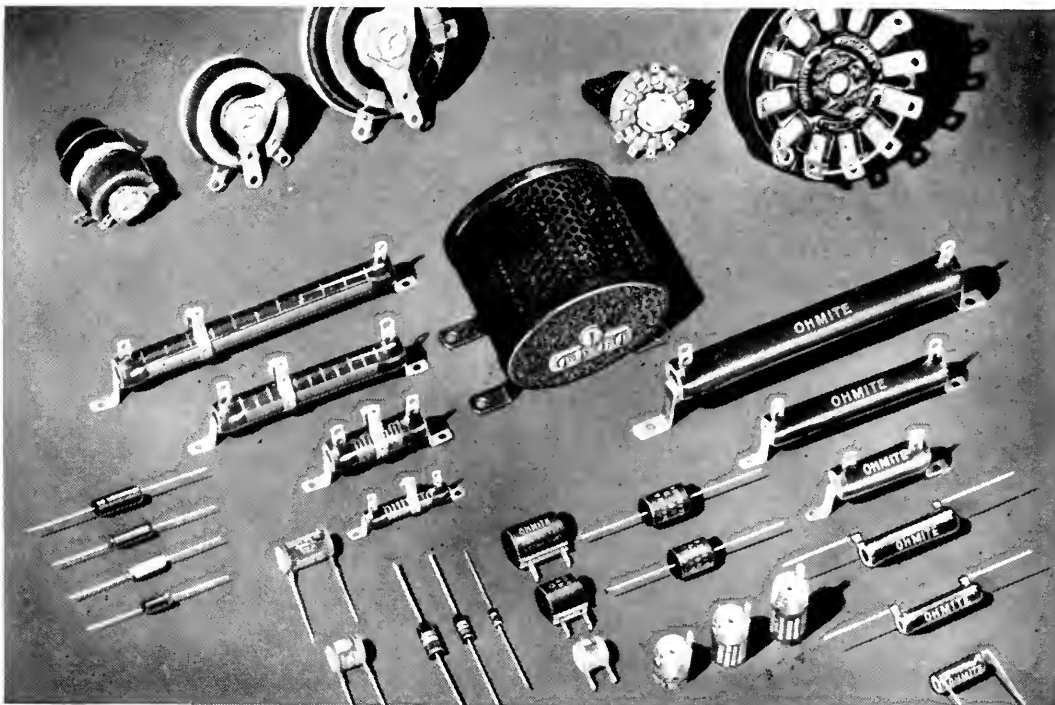
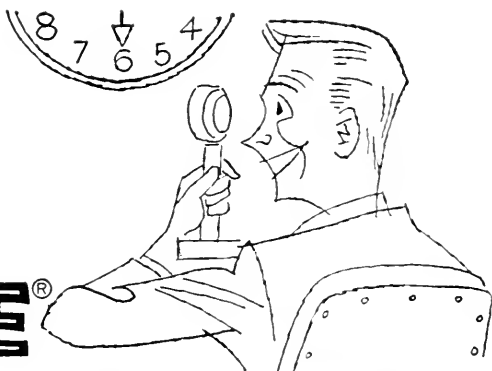
**GEORGIA** — SCM, George W. Parker, W4NS — SEC: OPS. PAMs: ACII and LXLE. RMs: MTS and OCG. Nets: Georgia Cracker Emergency Net meets on 3995 kc. Sun. at 0830, Tue. and Thurs. at 1830 EST. Georgia State Net (GSN) meets on 3590 kc. Mon., Wed., and Fri. at 1900 EST. CCM has a new 500-watt rig. It is a new YL at QDM. DJF is working on a kw. sideband rig. BVE is working on a modulator for his c.w. rig. KN4BXD is a new Novice in Jackson. YTO made WAS. CFJ sold his kw. sideband final and is building a new one. A new club has been organized at Quitman High School. KN4BBI is new in Bainbridge. New officers of the Thomasville Radio Club are NDX, pres.; ZDP, secy.-treas. The South Georgia Rag-Chewers Net held its annual picnic meeting in Thomasville. The Southeaster Single Sideband dinner was held in Atlanta on Feb. 19th with more than 70 sidebanders in attendance. KN4s ADV, AYC, and BAI are active in Columbus. YUM has a new 35-ft. pole in his backyard and is active on 15 meters. MTS is building a sideband rig. DOC has a new 32V-2 and a 75A-3. RVH now is mobile. ZUF has a new

(Continued on page 108)

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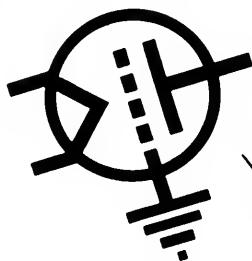
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103



# PENTA

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beam on a 35-ft. telephone pole and is after that rare DX on 20 meters. YU1GM (GMP) works the home town regularly from Belgrade. HYN, in LaGrange, is back on the air on 75 meters. All appointees are requested to check appointment expiration dates and forward their certificates to the SCM for endorsement if over one year old. Traffic: K4WAR 706, W4CFJ 320, PIM 315, BVE 225, ZDP 64, BWD 30, NS 22, MTS 20, ZD 14, K4BGB 10, W4YTO 2.

**WEST INDIES** — SCM, William Werner, KP4DJ — KD renewed ORS appointment. The appointments of HZ, QR, and KG4AO have been cancelled because of inactivity. ZW is preparing to get on 75 meters to QSO Island stations. SK, one of our co-workers and an old-time amateur, has gone back to W2-Land. ABC has a new Viking Ranger working on all bands. W2ADD visited WV at Aquadilla. W2TO visited AZ, MP, C.D. Radio Officer, is active on 75 meters. RA has returned from a long visit to the States and promises early activity. WD made WAC'-phone. YT has a new HRO-60. DA is active on 7 Mc. DV and ZW are working feverishly in the c.w. portion of the DX Contest. ACB, with the highest QTH in KP4 on top of a mountain near Castaner, applied for amateur weather observer appointment to report to the Antilles Net. ABA has 40-meter vertical. US, ZC, AAA, ABA, ABD, and ACB visited the SCM. AAA is CAP Radio Officer. KD has a new 80-meter Zepp and reports working 64 countries on 3.5 Mc., 86 on 21 Mc., 18 countries and 4 continents on 1.8 Mc. US and ABA were subjects of a two-page write-up in a newspaper printed by the Dept. of Instruction with an 8 x 10 picture in color on the front page. AZ has a new Lyco Transmaster. Traffic: (Feb.) KP4WT 76, ZW 8, DJ 2. (Jan.) KP4WT 90.

**CANAL ZONE** — SCM, Roger M. Howe, KZ5RM — AU and FL moved into new homes in the new housing development on Ridge Road. They are practically across the street from each other, but both claim this is not going to cause trouble because they are going to install a special switch which will automatically lock out the other's converter for a half hour. The ham gang surprised ML and FL with a house-warming party at their new QTH. New license application forms are in the making and shortly will be available at the Cristobal, Margarita, Balboa, and Balboa Heights Post Offices. They also will be available at either of the two radio clubs. JW, CZARA club station, is in business with the interlaced 10-20 beam. SCM, RM, and his XYL, KA, will be on leave Stateside from the end of May to the end of August, during which time SEC, WA, will act as SCM. Traffic: KZ5WA 118, DG 52, CF 30, KA 22, LB 11, GD 9, BD 8.

## SOUTHWESTERN DIVISION

**LOS ANGELES** — SCM, Howard C. Bellman, W6YVJ — Explorer Post No. 177, SLW, worked PY4DK with its 500-watt Grayhound Mobile. These boys are all physically handicapped. KN6ICF's best DX is WN7YHD, in Montana. All scouts are invited to take part in radio classes at the Lowman School, North Hollywood, 7:30 to 9:00 P.M. Fri. QJW reports that the ECs in the southern part of Los Angeles County are participating in the American Heart Campaign by providing mobile units to pick up money from the volunteer workers. Two W6s were heard by 5FAG, Albuquerque, on Feb. 18th, according to ORS, who worked FAG on the 21st on 75 meters. Apparently this was caused by ionization from atom blasts. K6BAG, the Mt. Pacific Radio Club, is scheduled for the mountain of the same name next Field Day. K6JLY, publicity secretary of Hamilton High Radio Club, indicates that the Club's constitution now includes words which provide for expulsion of any member known to be "bootlegging." *The Oscillator*, from Long Beach, reminds us of the YLRL Convention to be held at the Miramar Hotel in Santa Monica in June. New calls for "Riohons" include K6JLS, TV technician at Lovell's, a recent graduate of the code class. Russ is on the Novice c.w. bands. Tom Lovell, sr., father of KN6IPD, is now KN6JRH and has worked San Francisco with his Heathkit. Another father and son combination will be Pres. Beaird, who recently passed the Novice exam and is awaiting his call, and his son, Gil, now General Class with the call K6IMF. Gil is on 40-meter 'phone with a Globe Scout. KN6IMG is bringing his dad around to code classes. The Jennings family, father and two sons, are making progress toward 5 w.p.m. Thanks for the report from UKC, of the *Riohon Listening Post*. FMG has asked for cancellation of his ORS appointment as he expects to be very inactive in ham radio circles in the near future. Traffic: (Feb.) W6MBW 225, USY 234, GYH 210, KDQA 172, W6CAK 139, KN6HOV 104, W6MLZ 100, CMN 91, BHG 70, ORS 66, K6COP 32, BWD 31, W6CK 28, HIF 12, CBO 5, FAI 3, K6BEQ 1. (Jan.) K6FCZ 945, W6FAT 6.

**SAN DIEGO** — SCM, Don Stansifer, W6LRU — Asst. SCMs: Tom Wells, 6EWU; Shelly Trotter, 6BAM; Dick Huddleston, 6DLN. SEC: VFT, ECs: BAO, BZC, DLN, HIFQ, IHL, HRI, IBS, KSI, KUU, and WYA. RM: ELQ.

(Continued on page 110)



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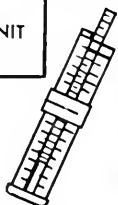
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AUTOMATIC Radiation-pattern Control

AUTOMATIC Colinear Array on 15 and 10 meters (V-37)

ALL with maximum operational EFFICIENCY and convenience

*Then YOU want—and can NOW HAVE—your CHOICE of a VARIETY OF MODELS of "E.D." All-Banders which have been*



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by Antenna Scientists

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*For Ham Radio at its BEST on your Xmtr & Rcvr  
For a THRILL as New & Potent as an "H" bomb  
For the TOPS in operating efficiency & convenience*

We are seeking alert amateurs who own our antennas to tell our story to other interested amateurs in their own communities and we expect to pay well for this service. It can be a profitable part-time occupation for you.

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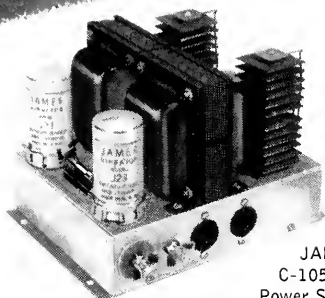
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# JAMES

## Ham mobile power supply



JAMES Model  
C-1050 Vibrator  
Power Supply com-  
plete with vibrators,  
fuses, rectifiers.

Wired and Tested.....Amateur, Net.....\$49.95  
Kit Form .....Amateur, Net.....\$39.95

The new JAMES "Dual Operation" vibrator power supply for amateur mobile service, with commercial communications features . . . using dual vibrators, oversized transformers, selenium rectifier, the pack is ruggedly assembled for long trouble-free service on mobile installations.

- 6/12 Volt Operation
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- Transmitter High & Low Voltage
- Selenium Rectifiers
- Dual Standard 4 prong, 6 volt Vibrators

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# JAMES

VIBRAPOWER COMPANY

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The entire San Diego section mourns the recent passing of Johnnie and Neva Fredenburgh, VJQ and YX1, who were killed in an auto accident. K6JCF, ex-W4VZH, is now in Del Mar. KN6JGH is a new Novice in Vista. Officers of the Gillespie Club are K6ILO, pres.; W6KUU, vice-pres.; and K6DXZ, secy. The Rohr Club now has a Viking II on the air. SKB is recovering at home after a recent auto accident. The Convair Club has a Collins 32V-3 on all bands. K6CTQ worked 12 new countries in the DX Contest on c.w. BSD is now handling traffic on RTTY. The Orange County Club is conducting code and theory classes in cooperation with c.d. in the area. K6DNO now sports a BC-342 while KN6HKY has an NC-183. LYF has a Ranger. FJH, our ex-SCM, is now in Arcadia. All clubs continue to show activity preparing for Field Day. The club call for the new Gillespie group is K6JCC. SYA and his XYL recently vacationed in Death Valley, but came home early because of the intense cold. The meeting space for the Convair Club will be doubled in a new building soon to be completed. VFT is back at his normal duties of teaching after an enjoyable trip East to receive the Edison Award. A 9- and an 11-year-old at Silvergate Elementary School passed their Novice tests and are awaiting calls. All persons holding appointments in the section are asked to send certificates to the SCM when they expire so they can be endorsed and returned. This would help me to keep my records straight. Traffic: W6IAB 3350, YDK 621, BSD 599, IZG 91, K6DBG 32.

**SANTA BARBARA** — SCM, Vincent J. Haggerty, W6IOX. K6NBI still is the traffic leader in this section. QIW says poor conditions make for hard work on the traffic nets lately. Activity at FYW is limited to CAIRS and local contacts presently. AGO skeds the East Coast on 3.5 Mc. BRY's brother is now K6END. IID is finishing his s.s.b. final amplifier and working on a 2-meter receiver. Members of the section are urged to give their support to QIW, your new SCM as of April 12th. Congratulations, Bill! Traffic: (Feb.) K6NBI 93, W6QIW 8, FYW 4, (Jan.) W6QIW 26.

## WEST GULF DIVISION

**NORTHERN TEXAS** — SCM, T. Bruce Craig, W5JQD — SEC: RRM. PAMs: PAK and IWQ. RM: PCN and QHI. SQX has returned to Lubbock and Reece AFB. BSX reports 15 members of the Cleburne Club have a project of 5-10-meter transmitter-converter to tie in with the Sheriff's Dept. WB has given more than 400 exams in the past 25 years. New officers of the Snyder Club are FPH, pres.; COU, vice-pres.; CRP, secy.-treas. CDO has cubical quad on 20 meters. BXE has moved back to Snyder. New officers of the South Plains Amateur Radio Club at Lubbock are NGX, pres.; TUW, vice-pres.; and IIDX, secy.-treas. OBS is in Germany. GLX is a new YL ham in Tyler. AJ renewed his commercial license. IMQ worked Canal Zone on 35-watt 15-meter home-spun rig. The Blue Ridge Net, on 160 meters, had an 88 per cent attendance on 1880 kc. for February. UUR reports on the annual Boy Scout Ham-oree held Feb. 20th, conducted by No. Tex. Emerg. Net. Code classes are being conducted by amateurs and Naval Reservists each Tues. at 7:30 P.M. in the Naval Armory, Lubbock. TFP reports WN5HHK's father is WN5KAS, Dallas. YL YKE worked YL KZ5DG in Canal Zone on 15 meters. BMR reports on the early morning ham breakfast held each 3rd Sun. at the Piccadilly Cafeteria in Fort Worth. CF worked into the No. Tex. Liaison Net from mobile while en route to the Lawton Hamfest. QGR, Midland Club president, reports the City decided land to the hams for the new club house they are building. NRI is back on mobile after being off when s.s.e. took his fancy. GVA is all-band mobile. ESR is back on NTEN after recent surgery. GQN has organized the TNT (Texas Novice Traffic Net), which meets at 1900 CST each Tue. on 7191 kc. Traffic: K5FFB 870, W5KPB 366, DTA/5 355, BAT 212, PAK 196, AHC 187, UBW 160, ACK 136, CF 129, BKH 122, OCV 37, YKE 27, ASA 26, HKF 7.

**OKLAHOMA** — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Canady, 5GIQ. SEC: KY. RM: GVS. PAMs: PML, SVR, and ROZ. The Lawton-Ft. Sill Radio Club Hamfest and Dinner held at the Hotel Lawtonia was the highlight of the month with both the newly-elected Director, CF, and the Vice-Director, MA, present and making short talks. PML was M.C. and allowed your SCM and SEC, KY, to say a few words. A total of 94 attended the dinner with about 35 ARRL members present. KY is doing an exceptional job in lining up and training ECs for as many counties as possible and now has over 60 per cent of the counties covered. The usual tornado path from the S.E. to the N.W. across the State is almost completely covered. The tornado season has begun and the progress of the squall line is being followed by a storm-warning net, with CZB as originator and NCS. A tie-in with the state weather bureau is in the process. The North Fork ARC has set the date of its annual hamfest and picnic at Quartz Mt. Park as May 21st and 22nd. Your SCM has been remiss in notifying ARRL appointees of expiration of their appointments, but appointments will be made on the recommendation of the RM, PAM, or Net Mgr. if application is made for OPS, ORS, or OPEN certificate. Traffic: W5GVS 143, MRK 83, FEC 69, ADC 56, GXH 41, TKI 44, MGK 41, (Continued on page 112)

# HARVEY PRESENTS CENTRAL ELECTRONICS EQUIPMENT for AM, CW and SSB



## NEW BROAD-BAND Linear RF Amplifier Model 600L

The 600L has no tuning controls except a single knob selector covering all amateur bands from 10 through 160 meters. Requires only 2 watts effective or 4 watts peak envelope drive power for 500 watts dc input. New band-pass couplers provide 60 to 65% linear efficiency. Uses single 813, class AB<sub>2</sub> and has automatic relay to protect 813 and RF couplers.

New meter features include: reads input power directly in watts . . . reads grid current . . . reads output in RF amperes . . . shows reflected power due to mismatched load . . . input level calibrations for AM, PM and CW. Function selector knob switches meter to any reading while transmitting.

Has built-in power supply with excellent regulation of bias and screen voltages. The 600L is effectively TVI-suppressed with thoroughly shielded and bypassed RF compartments.

Available in either table or rack model.

Complete (factory-wired) **\$349.50**

## New 'Q' MULTIPLIERS

A tunable IF electronic filter that provides tremendous receiver selectivity for peaking or rejecting signals on AM, CW or SSB. Employs new 2-tube circuit with high-Q inductor. Continuously variable from 60 cps to normal IF pass-band. Interfering carriers attenuated up to 50 db.



AQ



DQ

**Model AQ** — Designed for installation in Model A Slicer. Includes new front panel. Power-IF cable plugs into accessory socket.

**Kit** **\$22.50**  
**Wired** **\$29.50**

**Model DQ** — Designed for use with any receiver with 450 to 500 kc IF. Has power-IF connecting cable. Power requirements are 225-300 vdc at 12 ma and 6.3v at .6 amps. Can provide additional selectivity and 8FO for mobile SSB or CW reception.

**Kit** **\$22.50**  
**Wired** **\$29.50**

## SIDE BAND SLICER Model A



Permits selectable SSB reception on any receiver with 450-500 kc IF. Cuts QRM and reduces interference from 15 kc TV harmonics. Has built-in power supply.

**Kit** **\$49.50**  
**Wired** **\$74.50**

**AP-1 ADAPTER** — Plug-in IF stage for use with Slicer. Allows receiver to be switched from SSB to normal.

**Wired** **\$8.50**

**AP-2 ADAPTER** — Combines AP-1 and crystal-mixer for use with receiver having 50, 85, 100, 915 kc or other IF systems.

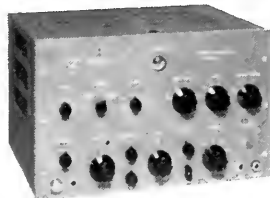
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## SIDE BAND SLICER—Model B

Complete Sideband Slicer same as Model A, but including built-in 'Q' Multiplier. Does not require AP-1 Adapter.

**Kit** **\$69.50**  
**Wired** **\$99.50**

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## Model 20A MULTIPHASE EXCITER

20 watts peak envelope output on AM, PM, CW, and SSB. Has single switch for sideband selection. . . VOX on AM, PM and SSB, plus break-in operation on CW . . . bandswitching, 160 through 10 meters . . . magic eye indicator for carrier null and peak modulation . . . plus many other features. Choice of table or rack model.

**Kit** **\$199.50**  
**Wired** **\$249.50**

## Model 10B MULTIPHASE EXCITER

10 watts peak envelope output—AM, PM, CW and SSB. Uses plug-in coils. Improved version of earlier 10A.

**Kit** **\$129.50**  
**Wired** **\$179.50**

**Write for HARVEY's  
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## Model QT-1 ANTI-TRIP UNIT

All-electronic VOX break-in anti-trip unit for use with loudspeaker. Prevents loud signals, heterodynes, etc. from tripping voice break-in. Plugs into socket of 20A or 10B Exciter.

**Wired** **\$12.50**

## 458 CONVERSION KIT

Basic 458 conversion parts kit, 15 to 160 meters with dial, etc.

**Kit** **\$15.00**

**Case and Panel Kit**  
for 458 conversion **\$10.00**

## New—For 10 Meters Model 458-10

Crystal-controlled converter package to extend 458 VFO into 10-meter band. For use with 458 Conversion Kit.

**Kit** **\$27.50**  
**Wired** **\$37.50**

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(with 78 rpm phonograph records)  
(UNBREAKABLE in normal use)

PASS COMMERCIAL AND AMATEUR CODE  
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**No. 2 — SENIOR CODE COURSE.** You get and keep everything given in the Novice Course except that you get 22 recordings (alphabet through 18 W.P.M.), plus typical FCC type code exams for General class and 2nd class commercial telegraph licenses. All this for only.....\$12.95

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**No. 5 — RADIO AMATEUR QUESTION & ANSWER LICENSE GUIDE.** A "must" if preparing for Novice, Technician or general class exams. Approx. 200 questions & answers (most multiple choice type) similar to ones given on F.C.C. exams. Has 2 typical F.C.C. type exams. Other questions by subjects, easier to study. Low, low price of

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With Built-in Key-Click Filter

In Kit Form  
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The AMECO Code Practice Oscillator, for 110 volts AC or DC, with a built-in 4 inch speaker, produces a pure, steady tone with no clicks or chirps. It can take a large number of headphones or keys. After the code has been learned, the AMECO code practice oscillator is easily converted to an excellent c.w. monitor.

Other features include:

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- Sturdy grey hammertone cabinet
- Lowest prices

In Kit Form, with Instruction, less tubes (Model CPS-KL).....\$11.75

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Set of two tubes (35W4 and 50C5).....\$ 1.80

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**SOUTHERN TEXAS —** SCM, Dr. Charles Fermaglih, W5JFF — ABQ, who has been in bed for a very long time, is now up and around again and beginning a full kw. rig just for 80-meter c.w. Good luck to you, Jerry, and we are all happy that you are recovering. URW is doing a lot of MARS and NTO operating and soon will be heard on STEN. The next Annual STEN Meeting will be held in Kerrville May 28-29. From *Gutter Dope*: FND and his XYL are moving into a new home on the north side. V1 is sporting a new mobile on 75 meters and a new QTH out on Fredericksburg Rd. EPB is building a new Q multiplier. TIU has just installed a new Elmac transmitter in his mobile. We wonder if JHH has his car painted yet, and how about the 24-volt system? GK1 is ready to fire up an ART-13 mobile. Emergency Net NCS, KQG, has recovered from laryngitis. EVT is having lots of fun operating his new Viking Ranger. LVE is mounting his put-put on a new trailer. OER reports 3855 kc., the mobile frequency, is crowded in Houston. TSE says we should be seeing LFG soon. The Galveston County ARC is doing an FB job of publicizing amateur radio. ULN presented a program on oscillators. The Club call is KMK and Campbell is trustee. The GCARC had an FB picnic in March. Elder, Judd, and Bolles were the committee. New Novices in Galveston County are Mr. and Mrs. W. C. Fulton and Jimmy Taylor. WN5JSV, and OM, WN5JSU, share the same station. Jim's call is WN6GMX. DJG, a 13-year-old YL, is thought to be the youngest in Texas. AET has moved to a new QTH in Pharr and is loading up the clothesline pending completion of an antenna. FZO is back on the air with his numerous transmitters but he still is having some trouble. The hams in Hidalgo County participated in the Red Cross simulated disaster Mar. 5th. DTJ is on 40-meter 'phone and c.w. with 60 watts for the first time since 1951. It is his first 'phone rig since becoming a ham in 1933. At a recent meeting the HARC elected RPW, pres.; Sam Dixon, vice-pres.; FZD, treas.; URU, secy.; PBX, membership chairman; VWF, prog. chairman. Traffic: W5MN 631, FJF 42, ABQ 16, URW 16.

**NEW MEXICO —** SCM, G. Merton Sayre, W5ZU — SEC: KCW, PAM: BIW, V.H.F. PAM: FPB, RM: JZT. The NMENP meets on 3838 kc. Tue. and Thurs. at 1700, Sun. at 0730; the NM Breakfast Club every morning except Sun. 0700-0830 on 3838 kc.; NM C.W. Net daily on 3633 kc. at 1900. Changes in NCS for the Breakfast Club: Mon. ZGG, WKX; Tue. TBP, BZB; Wed. CEE, AK; Thurs. WBC, GYN; Fri. CEE, VLZ; Sat. PSP, CXN. WBC is NCS for Tue. and Thurs. NMENP, with CXN alternate; GEM is NCS Sun.. BXP is alternate. BIH and FPB are candidates for the SCM post. Remember the State Ham Picnic at Albuquerque June 4-5, the West Gulf Division Convention at Fort Worth June 10-12; and Ruidoso in 1956 for the West Gulf Division Convention site. AQQ has left the State. NMENP stood by for three days when Albuquerque amateurs provided communications in connection with the TWA plane search and rescue activities in the Sandia Mountains. Caravan Club members did a grand job. WIY and CGE moved to Mojave. DNK, ECS, FAG, FPB, HAG, NSJ, RKS, UEO, UZL, WIY, YXM, and others were at the Feb. Albuquerque V.H.F. Club meeting. FAG and NSJ are trying to work DX after each Nevada test. SB is in Farmington as a TV engineer. GUB attended Chicago school on microwave and teletype maintenance. PBV works on u.h.f. gear for CAA. PO1 lost his whip and coil in a snow storm. AAU has a communications service in Farmington. Traffic: K5WSP 268, W5RFP 54, QR 48, JZT 43, VLZ 40, HJF 39, WPA 39, AQQ 38, CEE 31, HOE 16, ZU 15, ARD 12, BZB 9, BIH 5, BXP 5, WBC 5, DZB 4.

## CANADIAN DIVISION

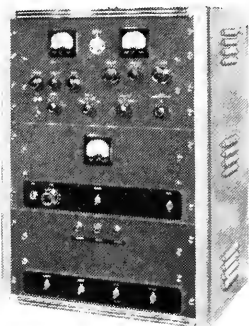
**MARITIME —** SCM, Douglas C. Johnson, VE1OM — Asst. SCM: Fritz A. Webb, 1DEB, SEC: RR, RMs: VE1HJ and VO6X, PAMs: VE1OC, VO2AW, and VO6N, ECs: VE1AAV, VE1DG, VE1DW, VO2G, and VO6U. A new appointee is PF, PAM for N.B. We regret the passing of E.A. Clary was particularly noted for his 160-meter transatlantic pioneer work, and had set a number of DX records on that and other bands. The Cape Breton C.D. Net meets Sun. at 1:30 p.m. on 3750 kc. Congrats to AV and his XYL on the new jr. operator. A movie interview of FQ was shown on CBHT after Brit had informed the press that two missing Arctic travelers were found. BN is using new all-aluminum sky hook with 450-ohm feed. VO1M, M, U, V, and Y have migrated to 20 meters. VO1AB has a new mobile. VO1AE is active on all bands. VO1AM is back on after a few years layoff. VO3X and VO1D participated in the BERU Contest. W4BRP/VO2 has 5 watts on 3.5 Mc., and 500 on 14 Mc. Congrats to VO1AH and his XYL on the new jr. operator. VO6N is running 150 watts and has worked up to 77 countries. VO6AH is Acting NCS for the Labrador Net. The GBARC is conducting a training program in theory and code under the direction of VO6R. Traffic: VO6N 158, VE1FO 129, VO6B 106, VE1PX 51, VO6S 46, VE1HJ 35, VO6AF 34, VE1QM 33, VE1UT 29, VE1OM 28, VE1ME 20, VE1OC 15, VO1D 8, VE1DB 3, VE1AV 2.

(Continued on page 114)



# Everybody's Talking About Our GLOBE KING!

*A Globe King transmitter was used in the Amateur Radio Booth at the recent State Fair of Texas. How did it operate? Here's what Mr. Edward F. Aymond, Jr. Amateur Day Committee Chairman, has to say:*



## THE 500 WATT Completely Bandswitching GLOBE KING

Here's an advanced design, high power transmitter of 500 watts input on both CW and fone 100% modulated. Is completely bandswitching 10 thru 160M. bands. Consists of FR, Speech Modulator and Dual Power Supply Sections. Entire unit is specially screened for TVI. Pi Network output matches any antenna from 52-600 ohms. Has provisions for VFO and Single Sideband input. Forced air-cooled 4-250 tube, push-talk, special aluminum mesh screening of RF Section — just a few of the many fine features. Enclosed in grey hammertone cabinet, 31" x 21 3/4" x 15".

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**And write for complete information about:**

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- ✓ Single Sideband Eqpt.
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Edward F. Aymond, Jr.  
Dallas, Texas  
WSUHV

"... was operated on 14.228 mc for 16 days continuous from 10:00 a.m. till 10:00 p.m. Some 200 different amateurs used this transmitter and not once ... did we have any trouble whatsoever.

"... no interference either on the video or the sound as a result of the Globe King being operated in this close proximity (3 feet) to (two) television sets. During the operation at the Fair, 41 states were contacted, 5 of the Canadian Districts, Alaska, Hawaiian Islands, Canal Zone, Cuba, Nicaragua, Honduras, Peru, and Columbia. All operation was via phone.

"... we were more than pleased with this operation and wish this transmitter had belonged to one of us personally"

*and ...*

Dan Hoover (W9VEY) of Hillsboro, Illinois says, "It sure is a wonderful rig. GRM just melts and backs off to either side."

In the words of George H. Cooke (W2LOP) of 25 Cottler Ave., Springfield, N. J.: "... there is absolutely no interference on our own TV set ... Needless to say I'm very well satisfied with my purchase."

And from Don Smith, La Junta, Colorado: "I think you have topped the field ... I congratulate World Radio Labs for really turning out a FB rig!!! ... The modulation reports I get are 'The best sounding rig on the band OM what are you running?'"

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## 65 WATT GLOBE SCOUT

**Completely Bandswitching**

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# Quick QUIZ

Q. What are the procedures to be followed in renewing an amateur station and operator license?

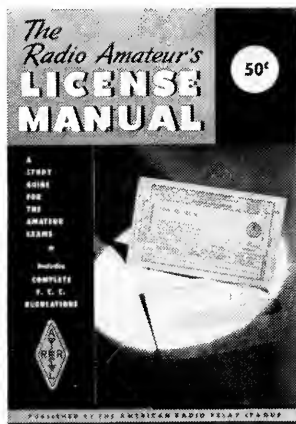
Q. Who may operate an amateur radio station?

Q. What are the requirements for portable and mobile operation?

Q. How do U.S. amateurs obtain authorization to operate in Canada?

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Complete FCC and International Rules and Regulations governing amateur radio . . . detailed explanations on amateur licensing covered in separate chapters . . . a complete index for ready reference . . . and, of course, separate study guides for all amateur operator examinations. . .

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RADIO RELAY LEAGUE**

West Hartford 7, Connecticut

**ONTARIO** — SCM, G. Eric Farquhar, VE3IA — We record with deep regret two Silent Keys, OW and AP. OW was well known as a member of the Air Transport Board and an active member of the Ottawa Amateur Radio Club. AP, a past secretary of the same club, and a member of the Dept. of Transport, was very active on 20, 40, and 80 meters. The Nortown Radio Club of Toronto is possessor of the Marconi Trophy for being top Canadian score in the 1954 ARRL Field Day operation. Up Simcoe way the Norfolk Club recently held a banquet, but lack of information has us guessing as to what took place. The annual banquet of the Brantford ARC was a tremendous success. Some eighty hams who attended, representing Windsor, Chatham, Cravenhurst, Elora, Toronto, Hamilton, Galt, Kitchener, and Belmont, heard some very interesting data on civil defense, ably presented by P. H. Fox, Chief Transport Officer for Canadian Civil Defense. He described civil defense as "a pressing necessity toward safeguarding the lives and well-being of our people and the preservation of that way of life which we hold so dearly and prize so deeply, within our hearts." 2BE, ARRL Canadian Division Director, who recently completed 25 years of service to Canadian Amateur Radio as its representative, outlined the benefits derived from being a League member. Touching on the AREC, which forms communication networks across Canada, he said, "These are the boys who control and operate the civil defense networks. All other organizations get their reservoir of trained personnel from this organization." TM changes receivers and says "There's a difference." BUR and his XYL were seen vacationing down Tampa way. VZ reports OSN activity keeps up. A newcomer in Belleville is BDT. VWI, in Kapuskasing, puts out a nice signal on 40 and 80 meters. BSW reports being the "first VE contact" to about 25 Novices. U.h.f. fellows are asked to be on the lookout on the 420-Mc. band for BDT, CAB, BEE, and ASD. Traffic: VE3GI 172, BUR 168, VZ 126, AJR 95, AUU 74, TM 62, DQX 38, BJV 35, CP 22, KM 22, NO 21, AVS 17, AOE 14, DPV 14, PH 10.

**QUEBEC** — SCM, Gordon A. Lynn, VE2GL — PQN is taking a beating these days from poor conditions, particularly long skip making short hauls difficult. However, DR continues behind it with quite a few stations reporting in. The same difficulty is being experienced on the Northland Net, as reported by FL. CA reports nothing new, just lots of traffic for the Far North. II has renewed ORS appointment after a lapse of a few years, this time from Sherbrooke. The St. Maurice Valley gang has one station or another covering 3675 kc. continuously throughout the day, as well as on 3740-ke. 'phone, on the lookout for traffic for that way. Reports from all parts of the VE2 district are solicited. Traffic: VE2CA 101, BB 82, LM 35, GL 16, CP 14, EC 14, ATQ 10, FL 10, LO 7.

**ALBERTA** — SCM, Sydney T. Jones, VE6MJ — PAM: OD, RM: XG. AL has n.f.m. and a.m. ready to go as soon as the OK has been received from the R.I. WC was away on a business trip to Houston, Tex. UB is active from the new QTH at Cowley. KL is building new remote control VFO. MJ is building a new antenna tuner. LQ has the new rig well under way. PS has a new TA12 rig. CE has plans for a vertical antenna. ZR has been hobnobbing with the Eskimos and working from VES-Land. Congratulations to WO and his XYL on the arrival of a YL jr. operator. CP stays up nights chasing the elusive DX. YE is active on the BC Net. Make plans now to attend the Alberta Hamfest which will be held this year in Lethbridge. It is with regret that the death of JJ is reported. A charter member of the Hat Ham Club, his advice and help were highly valued. Traffic: VE6HM 117, YE28, OD 27, AL25, WC7, IZ 5, MJ4.

**MANITOBA** — SCM, John Polmark, VE4HL — OO: RB. New officers of the ARLM are NW, pres.; MO, treas.; PE, secy. The Noon Net now is registered with the ARRL. EF is having trouble with his 20-meter beam. ML, IF, and JW are sporting new mobiles all with very nice signals. QD is having TVI trouble. JW has a new antenna but still has TVI. It is curling time so we don't see much of GB, XW, wouldn't it be better to stay on the ground? We don't have too many active YLs now. No reports were received from the 20-meter gang. A fine time was had by all at the ARLM's annual "Ham Do" Mar. 5th. The ARLM had a booth at the Sportsmen's Show and handled lots of traffic; a very nice showing for ham radio. Thanks to all relaying stations. Traffic: VE4GE 98, LO 18, EF 14, HL 14, KL 12, YR 11, QD 7, JM 6, AI 4, RB 4, AY 3, HS 2, OS 2.

**SASKATCHEWAN** — SCM, Harold R. Horn, VE5IIR — QL's activities are curtailed while changing the QTH to Govan. RE is looking after PAM duties in the meantime. LT finally made the air with 807s running 40 watts and puts out a nice signal. CM put in a busy week as communications station at civil defense, Fort Qu'Appelle. FG says his big traffic count is 1 delivered 1 received with a new addition to the family, a baby girl. Congratulations, Don. TV, at Swift Current, reports the formation of a club known as the Frontier City Radio Club with BC, pres.; TV, vice-pres.; and JR, secy.-treas. Meetings are held Fri. at 7:30 P.M. and any visiting ham is welcome. LU has changed his OBS frequencies to 3827 and 3798 kc. Tue. and Thurs. at 1830 hours. HN is a new ham at Nipawin and can be heard on 75- and 40-meter c.w. Traffic: VE5FG 31, HR 16, LU 12, VL 12, BF 10, DD 10, DS 10, CB 6, LJ 6, MX 6, CI 5, GX 4, LE 4, IL 2, RG 2, RE 1.

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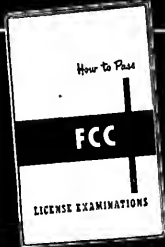
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## Antenna Coupler

(Continued from page 13)

(Global) provides a convenient load for transmitter adjustments. Our requirements were for power inputs up to 250 watts with the transmitter terminated with 50 ohms; however, work is being done on a 70-ohm version of the "Z-match."

The transmitter used here has a pi-network output circuit and this is adjusted for proper plate loading with  $S_2$  in the first position, which connects the 50-ohm dummy load. Power can be read in the forward position of the bridge on the proper scale. No reflected power will be evident with the resistive load. The proper forward reading scale on  $M_1$  should be selected by means of  $S_1$ , depending on the power output of the transmitter. As can be seen from the schematic and photographs,  $R_2$ ,  $R_3$ , and  $R_4$  set the 0-10-, 0-100- and 0-1000-watt full-scale levels. Reflected power calibrations are automatically taken care of by the settings of  $R_2$ ,  $R_3$  and  $R_4$  when adjusted in the forward position.

It might be well to note here that transmitters having outputs in excess of 50 watts should be tuned up at lower power, because the dummy load in the "Z-match" is rated at 50 watts and excessive power could ruin the resistor. However, the "on-the-air" rating of the "Z-match" is much higher than 50 watts.

The antenna should be connected to the output terminals  $J_3$  or  $J_4$ , depending on the frequency.  $S_2$  is then switched to the second position and  $C_{10}$  and  $C_{11}$  tuned for minimum reflected power, as read on the meter. The two controls will interlock somewhat, but a few trials will readily lead to a good null. The system is then ready for use. In testing with a wide variety of both antennas and resistive loads, the reflected power was below one watt in all cases. After this minimum or zero reflected-power reading has been obtained no readjustment of the transmitter is necessary if it has previously been adjusted to work into the dummy load.

The tuning capacitor  $C_{11}$  will be near maximum capacitance for both 3.5- and 14-Mc. operation, while the setting will be near midscale at 21 Mc. On 7 and 28 Mc., the capacitance will be nearly at minimum. The setting of  $C_{10}$  will vary with different loads. In the third position of  $S_2$  straight-through operation can be used, enabling the amateur with a matched 50-ohm line to use the bridge. The bridge is an excellent instrument for adjusting element lengths on a beam for lowest reflected power.

(Continued on page 118)



As a service to visiting mobileers, the Amateur Radio Society of Eglin Air Force Base, Fort Walton, Fla., maintains a monitoring watch on 29,560 kc. Signs patterned after the ARRL diamond have been posted on main highways in the area to bring attention to the call-in frequency.

**W3LOE**  
— • — • —  
— — • —

BOB CHEEK . . . WHO HAS BEEN A "HAM" FOR 23 YEARS AND OPERATES W3LOE . . . IS ASSISTANT MANAGER OF THE ENGINEERING DEPARTMENT AT THE WESTINGHOUSE ELECTRONICS DIVISION.



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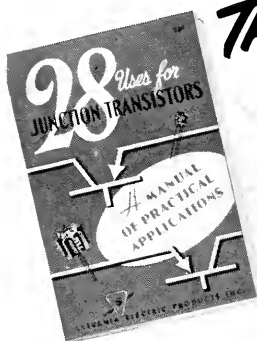
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## Results

The "Z-match" has been in use at the writer's station for the past several months and the results have been excellent on all bands from 3.5 to 30 Mc. Two transmitters have been used. One is a Harvey-Wells T-90 Bandmaster running between 75 and 90 watts input on both c.w. and 'phone. The second, with a pair of 4-65As in the final running inputs up to 300 watts, has been used with no apparent breakdown of capacitors, coils or the Z bridge. The first transmitter utilizes a pi-network output tank, and after tuning this properly on any band into the 50-ohm load, no retuning is necessary after the "Z-match" is tuned for minimum reflected power. The second transmitter uses an all-band tank with series-tuned link output and the results were the same with this output circuit. The fact that retuning the transmitter is not required after tuning the coupler for zero reflected power indicates a definite impedance match.

Although the functions of the "Z-match" have been described in terms of matching the transmission line to a coax line to the transmitter, it is equally useful for coupling the line to a receiver. The same antenna is used for both transmitting and receiving at the writer's station, and received signals have been given a tremendous boost by the use of this coupler, mainly because the receiver has a nominal input impedance of 50 ohms and its antenna terminals are finally looking at the proper impedance. The send-receive switching is of course done in the coax link.

After operating conventional-type antenna couplers with no visual means of obtaining a match, we wonder how many times a mismatch has been tolerated. Quite often, we think, at this station, because the percentage of contacts for stations called has gone up tremendously since the installation of the "Z-match," and in the recent DX contest the speed of tuning helped in running up the best score we ever had, on both 'phone and c.w.

## Mobile Antenna Tuning

(Continued from page 18)

completed unit is ready for testing and adjustment. With all turns of the variable series antenna inductor removed (tap at top of  $L_1$  in Fig. 4), the externally-mounted loading coil (center or base) should be adjusted for resonance at the extreme high end of the band in use. This adjustment will place the transmitter and the antenna system on precisely the same frequency. Temporarily disconnect the tuning motor from the control unit. Adjust balance control  $R_1$  to its electrical center position, and adjust the sensitivity control to the point where both relays  $K_1$  and  $K_2$  (Fig. 3) are operated, as evidenced by illumination of both indicator lamps,  $I_1$  and  $I_2$ . Then slowly back off the sensitivity control until either one or both relays deenergize. If both relays

(Continued on page 120)

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System consists of portable amplified electronic megaphone—operated by a trigger switch in the pistol-grip-handle—dynamic type microphone unit rated at 50 ohms at 1000 cps, and a reproducing unit, all contained in megaphone mouthpiece and housing.

A powerful 20 watt 6 tube amplifier, housed in a water-proof, two-piece, portable metal case (as illustrated), having compartment for and supplied with 3-cell 6-volt storage battery. Amplifier built with finest quality parts to rigid Navy specifications.

**A UNIVERSAL BATTERY CHARGING RACK** that operates from 110 volts AC 50-60 cycles, 110 volts DC, 12 volts DC, 24 volts DC, 48 volts DC, or 96 volts DC. The charging rack consists of a battery recharger with time switch and also provides a space for stowing the portable amplifier. Two pilot lights in the front panel of rack indicate a "Low" or "High" charging rate. Timing switch controls the rate of charging. Has separate On/Off switch.

Approximate Dimensions & Weight : Megaphone 20" long, diameter 13½".

Amplifier dimensions—in 2-piece Portable Metal Case, housing 6 volt storage battery—13¾" H, 12¾" W, 9¾" deep.

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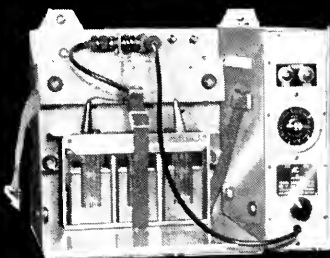
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drop out at the same positioning of the sensitivity control, no balance adjustment is necessary. If one relay drops out before the other, the balance control should be adjusted for simultaneous operation of  $K_1$  and  $K_2$ . Following adjustment of the balance control, the sensitivity control may be adjusted for optimum sensitivity. This system may be made sufficiently sensitive to respond to carrier shift brought about by nonlinear modulation and slight overmodulation excursions and to antenna detuning caused by passing pedestrians, automobiles or any phenomena causing even the slightest antenna detuning effect. Normal sensitivity adjustment is a matter of choice and will vary with individual operating requirements.  $R_3$  should not be adjusted to the point where  $K_1$  and  $K_2$  are energized simultaneously. Such an adjustment renders the tuning motor inoperative.

Sensing of this system may be changed by reversal of the output and input coaxial connectors. Reversal of the tuning-unit operation may be obtained by reversal of the two control leads from the remote control unit. In normal operation, series inductance is automatically added with a capacitive antenna and inductance reduced with an inductive load.

A great deal of satisfaction in mobile operating has been brought about by the use of this system. It is a real pleasure to QSY about the 40- and 75-meter bands without the worry of antenna resonance, and to be confident that no matter what the position of the mobile whip — *it is resonant.*

### Two-Tone Generator

(Continued from page 35)

#### Using the Two-Tone Generator

If the generator is used to test an s.s.b. exciter equipped with a high-impedance microphone input circuit, it will be desirable to divide down the output signal by means of a circuit such as shown in Fig. 4. If an input terminal or jack for audio

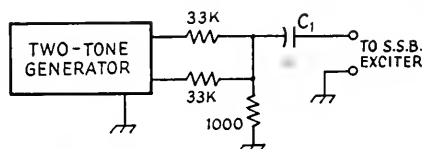


Fig. 4 — Method of connecting the two-tone generator to the microphone input terminals of a speech amplifier. The 33K resistors provide good isolation between the sources of the two output frequencies.  $C_1$  may be 0.01  $\mu$ f. for the usual high-impedance microphone input circuit.

input at higher levels is provided on the unit, the output of the generator need not be divided down. Since a few volts of d.c. exists from the output of the generator to ground, a blocking capacitor should be used if one is not employed in the equipment under test.

Two-tone test procedures have been outlined in references (2), (3) and (4). (See p. 124.)

(Continued on page 122)

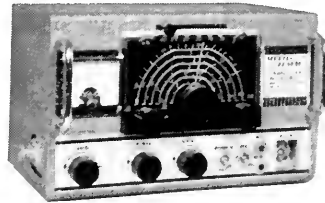
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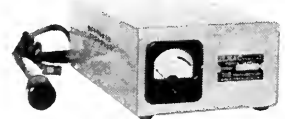
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photos of HQ-129 pass-  
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**Amateur Net**

Other models for other IFs to be announced soon.

Available from your local distributor  
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**R. L. DRAKE CO. MIAMISBURG, OHIO**

In the preceding paragraphs considerable emphasis has been placed on minimizing distortion. Low-distortion test signals are especially important when testing phasing types of transmitters because distortion on the test signal produces sideband components in the region of desired sideband suppression.

Another point which is worthy of consideration when evaluating the performance of the phasing-type exciter is the absolute phase shift in the 90-degree audio phasing network at the two test frequencies used. Reference (5), which discusses a typical phasing network, indicates a possible variation of about  $\pm 1.3$  degrees phase shift over a frequency range of 225 to 2750 c.p.s. For best results it is therefore desirable to select two test frequencies such as to produce equal phase shift; this results in equal suppression at each frequency and minimizes any slight ripple modulation which would otherwise be superimposed on the two-tone envelope output. Slight variation in components of one of the two oscillators may be made in this case so as to obtain a pair of frequencies fulfilling the above requirement.

The two-tone test generator is simple and inexpensive to construct and is believed to be a very worth-while addition to the test equipment used by the s.s.b. and a.m. man.

#### Bibliography

- 1) Ginzton and Hollingsworth, "Phase-Shift Oscillators," *Proc. of the I.R.E.*, Feb., 1941.
- 2) Reque, "Linear R.F. Amplifiers," *QST*, May, 1949.
- 3) Ehrlich, "How To Test and Align a Linear Amplifier," *QST*, May, 1952.
- 4) ARRL *Handbook*.
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#### Keyer

(Continued from page 37)

released.  $V_{10}$  conducts and  $R_{28}R_{29}$  is negative. The dash selection potential is clamped by  $D_4R_{26}$ . The dot memory clears as the dot starts.  $V_{10}$  cuts off on  $-13$  volts from  $R_{30}R_{32}$ .  $R_{28}R_{29}$  rises to  $+12$  volts to pass the dash selection to  $V_{11}$ . Conduction in  $V_{11}$  establishes  $+10$  volts at  $R_{25}$  for a dash on the next positive time-base pulse, and drops  $R_{19}R_{20}$  to  $-7$  volts to lock out any new dot selection made before the dash starts. The reverse transfer actions are obtained through circuit symmetry.

With their interlocks and activation circuits,  $V_{10}$  and  $V_{11}$  comprise effectually a tri-stable system. Either one or the other tube may be conductive, but never both. However, both tubes may be nonconductive. The three conditions correspond to selection of dot, dash, and spacing characters. By itself, this structure guarantees that a given character will be held in storage if an opposite type character(s) has been priorly selected, and it will not be released until that prior character(s) has been transmitted.

$C_8$  and  $C_9$  delay the rise of sequencer cathode voltages. When control is transferred from one

(Continued on page 124)



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KW amplifier . . . 1595.00	Gonset Super 6 . . 52.50	RME DB23 . . . . 49.50
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side to the other this delay guarantees that both memories are not cleared by the same clearance pulse and that both generating triggers are not tripped by the same time-base pulse. Without capacitive delay this would occur, since generator trip, memory clearance and sequence transfer are virtually simultaneous.

## Sequence Seizure

Thus far, a given sequencor tube cannot be activated by its associated memory or key until the opposite sequencor is released by both its key and memory, because of the interlock function.  $V_9$  and  $V_{12}$  generate seizure pulses to override the interlocks in such a manner that the output exactly follows the order of selection, regardless of subsequent key manipulations or holdings. The crisscross grid and cathode connection to the memories results in nonconduction in both tubes if both memories are clear or if both memories are actuated, and conduction in one of the tubes when the memory associated with its grid is actuated and the other memory is clear. This obtains from the following potentials in the memories: actuated—cathodes +11 volts, junctions  $R_{32}R_{33}$  and  $R_{40}R_{41}$  +1 volt; clear—cathodes +1.3 volts,  $R_{32}R_{33}$  and  $R_{40}R_{41}$  -17 volts. When both memories are actuated,  $R_{32}R_{33}$  and  $R_{40}R_{41}$  rise to +3 volts as the grid-current loading in  $V_9$  and  $V_{12}$  is removed.

Assume the dot and dash keys closed in that order before any output starts, with only the dot key held closed. Without seizure the closed dot key would hold the sequencor after the first dot on +10 volts from  $R_{37}R_{38}$  for continuous dot output, and the stored dash would not appear in the order of selection. However, when the dot memory clears, its cathode (and that of  $V_9$ ) drops to +1.3 volts and  $V_9$  conducts as a result of the +1 volt on its grid from the actuated dash memory.  $C_6$ , slowly reverse charged by  $R_{17}$ , charges through  $V_9$  and  $R_{18}$ . This momentarily reduces  $R_{19}R_{20}$  from +12 to -7 volts, to cut off  $V_{10}$  by pulling down the dot-holding potential at  $D_3R_{21}$ . Junction  $R_{23}R_{29}$  momentarily rises to +12 volts while  $V_{10}$  is cut off. The positive selection potential from the actuated dash memory seizes  $V_{11}$  via  $R_{26}$  while  $R_{23}R_{29}$  is positive, and conduction in  $V_{11}$  permanently holds  $R_{19}R_{20}$  at negative interlock potential to isolate the closed dot key. Thus sequence control has been transferred to the dash side despite the closed dot key, and the next output character will be the dash. When the dash memory clears, the still-closed dot key will reestablish  $V_{10}$  conduction for dot output. If both keys have been held closed, the dash hold potential will retain control of the sequencor, since the dot memory is now clear and no pulse will be generated by  $V_{12}C_{10}$  when the dash memory clears in the presence of an already-cleared dot memory.

Assume that the dash key is not closed until after the first dot (or any dot of a series) has started. The dot memory will be clear at this time with  $V_{10}$  conducting on the +10 volts from the closed dot key. The cathode of  $V_9$  stands at

(Continued on page 126)

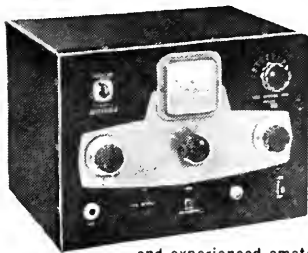


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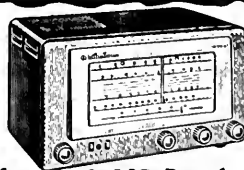
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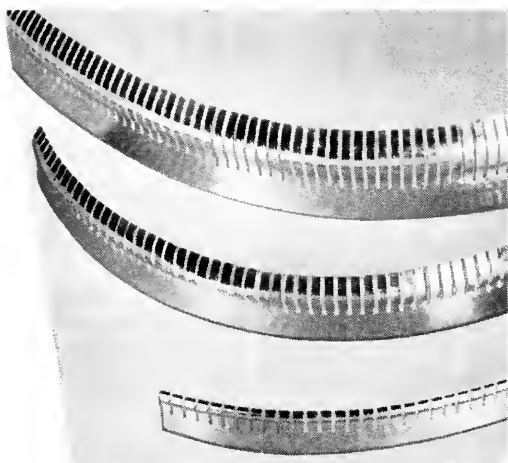
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+1.3 volts and that tube will conduct immediately when the dash memory is activated, seizing the sequencor as before.

In both cases, with both keys held closed, the subsequent output is a series of dashes until either the dash key is released or the dot key is released and reclosed. After clearance of the dash memory, release of the dash key applies -13 volts to the grid of  $V_{11}$  and initiates a simple sequencor transfer to the +10 volts from the closed dot key. Opening and reclosing the dot key with the dash key still closed actuates the dot memory for a  $V_{12}C_{10}$  seizure, and the output switches to dots. The opposites of these seizure actions obtain from symmetry.

### Summary of SMS Functions

1) Momentary closure of a key actuates the associated memory. The memory directs an activating potential toward the associated sequencor.

2) Continued closure of a key directs an independent holding voltage toward the associated sequencor. This hold potential is effective only after the associated memory has assumed or seized control of the sequencor.

3) Actuation of a memory with the opposite key and memory idle *assumes* control of the sequencor, isolating the opposite memory and hold potentials.

4) Actuation of a memory *seizes* control of the sequencor over continuously closed opposite key hold potential, if the opposite memory is clear.

5) Actuation of a memory does not take control of the sequencor over an actuated opposite memory.

6) Clearance of a memory whose key is closed allows an actuated opposite memory to seize control of the sequencor over the hold potential from that closed key.

7) Clearance of a memory whose associated key is closed does not relinquish control to an opposite closed key whose associated memory is not actuated.

8) In the absence of any actuated memories, release of one key after both keys have been held closed places the sequencor under control of the still-closed key.

### Summary of Actions of the Keys

1) A single character is generated by momentary or prolonged closure of a key. The character is held by the memory for a positive time-base pulse if the key is released prior to that pulse.

2) Successive like characters are generated by constant closure of a key.

3) When one memory is already actuated, closure of the opposite key before generation of the first-stored character activates the opposite memory. The firstly actuated memory retains control of the sequencor until one character of its type is delivered at the output. The secondly actuated memory then assumes control of the sequencor (as the first key is open or still closed) and the next output character is of the second type.

(Continued on page 128)



**"Fred understands what they're saying since he converted to single sideband"**

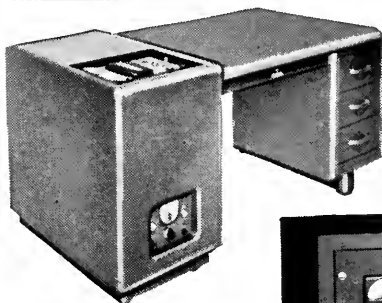
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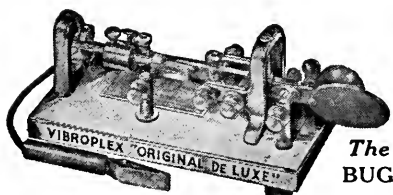
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4) Continued closure of this second key maintains control of the sequencer after the transfer action, and the output is a series of the second type until that key is released. This obtains even with the first key still closed.

5) Release of the second key, with the first key still closed, causes the output to revert to the first character type.

6) Release and reclosure of the first key (just a flick!) reactuates the first memory and seizes control of the sequencer — the second key closed all the while — and the output reverts to the first character type until that first key is again released or until the opposite type character is flicked in by the second key. At least one character of the first type is guaranteed by the memory.

7) In recapitulation, any closure of a key guarantees at least one character of that type, transmitted in correct relationship to the order of closure, regardless of intervening selective motions. Whenever a key makes contact, the output subsequent to the character in progress corresponds to that key until the other key makes contact or the first key is released.

With automatic spacing, perfect characters, and memory and seizure leeways, all the operator has to do is spell. With a few more tubes, the keyer might be tied in to a dictionary.

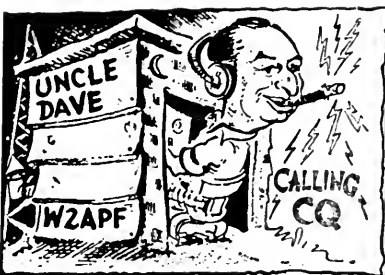
#### **D.C. Output**

To eliminate the one relay, the circuit modification of Fig. 3 (Part I) can be applied. With this circuit,  $V_3$  conducts during spacing and its plate stands 120 volts negative with respect to ground. Cut-off voltage from  $-30$  to  $-120$  is available at the arm of  $R_2$ , for control of a vacuum-tube keyer.  $R_3$  protects the memory clearance junction  $R_1R_2$  from loading effects by connected equipment and also serves as the key-click filter resistance.

The plate of  $V_8$  drops 60 volts on marking, transmitting a 60-volt negative pulse via  $C_1$  to the grid of  $V_3$ . The  $C_1R_4$  time constant is sufficiently long to hold  $V_3$  cut off for a 2-w.p.m. dash. With  $V_3$  cut off the output load stands at ground potential, marking condition for the standard vacuum-tube keyer.

Heavy line surges can produce as much as 10 volts negative swing across  $R_4$ . The 24-volt positive grid return of  $V_3$  to  $R_5R_6$  ensures that these surges do not appear in the output. Since the generator and SMS trigger configurations are quite independent of source voltage, they are stable in the presence of any surge short of complete outage. Use of this output circuit demands that  $V_3V_4$  be at the absolute ground end of any heater strings. Even though the 12AU7 heater-cathode insulation is rated at 180 volts, the maximum point is approached in  $V_3$  when the line voltage exceeds 125.

(Scramble in Part I, April, 1955, *QST*: Page 14, left-hand column, in last paragraph, the text should read: "... insulated from the chassis by  $\frac{3}{8}$ -inch Plexiglas. Metal pivot blocks, tapped for 8-32, are bolted to the  $\frac{3}{4}$ -inch Plexiglas levers and threaded on the 8-32 pivot bolts. The pivot bolts are secured. . . .")



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		W1BOD.....104,953-	544-67-A-10

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W7MKD. 12,509-149-43-B-14  
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W7VVC. 430-25-8-A-6

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W7NML. 43,238-381-65-B-38  
W7TDK. 31,569-317-51-B-27  
W7AXJ. 30,875-238-52-A-35  
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W7EUY. 31,128-237-58-B-39  
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W7NVT. 2,041-41-23-A-24  
W7CSK. 1,333-42-13-A-10  
W7ZB. 1,333-41-13-A-20  
W7ZU. 1,193-27-18-A-4  
W7TQ. 1,103-32-14-A-15  
W7HVM. 1,033-30-14-A-5  
W7VUW. 7-273-11-10-A-2  
W7CWV. 269-17-2-A-3  
W7SXN (W7S SXN SXQ)  
11,054-121-37-A-24

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W7VU. 41,974-267-63-A-36  
W7TVF. 35,580-243-60-B-23  
W7SXD. 17,438-38-23-B-5

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W6UTY. 104,025-570-73-A-39  
W6EAE. 90,388-519-70-A-34  
W6YHM. 68,272-503-68-B-33  
W6GNF. 35,588-219-65-A-26  
W6QBN. 31,566-263-60-B-18  
W6EGB. 30,749-235-55-A-35  
K6DYX. 21,240-180-48-A-27  
K6DWJ. 19,320-161-68-B-35  
K6DOD. 14,248-139-41-A-22  
K6BBD. 8,422-68-29-A-10  
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W6JIK. 4,219-70-25-A-12  
W6UW. 725-37-10-A-4  
KN6HOB. 588-25-10-A-16

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W6EFD. 70,800-475-66-A-38  
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W6PH. 47,652-361-66-A-28  
K6AUD. 45,612-363-63-B-36  
K6AUC. 31,213-232-55-A-32  
K6DVA. 27,008-203-54-A-29  
K6CCQ. 10,700-151-28-A-38  
W6UWH. 10,300-102-40-A-18  
W6JOH. 3,753-79-19-A-3  
W6EJA. 2,500-50-25-B-5  
W6AW. 1,890-36-21-A-18  
W6PAH. 1,811-35-21-A-11  
KN6EWP. 411-7-15-A-15

W6OJW. 10-2-2-A-1  
W6PYH (W4'D. W6PYH)  
106,489-587-73-A-40

#### San Francisco

W6HJP. 72,781-499-73-B-33  
W6YCV. 23,240-209-56-B-23  
W6HNP. 21,816-202-54-B-22

#### Sacramento Valley

W6MYT. 27,775-256-55-B-32  
W6HTR. 27,146-191-57-A-18  
W6SYV. 16,215-138-47-A-10

#### San Joaquin Valley

W6MPG. 47,439-386-63-B-40  
W6ZTY. 32,263-225-58-A-30  
W6EGX. 25,550-183-56-A-26  
W6UPS. 23,625-221-45-A-35  
W6QNF. 23,550-157-60-A-34  
W6SQN. 23,418-247-58-A-37  
W6ETU. 23,375-187-50-A-10  
W6PRA. 17,919-156-47-A-13  
K6AMW. 14,655-96-19-A-20  
KN6HFA. 1,935-12-7-A-5  
K6BLL (W6S ARI BRP BVM)  
BYH EFV IIT HYK WNE  
ZELVY K6ELZ, KN6S  
ECB GZY)

W6MYP. 133,960-734-73-A-40  
W6MYP (W6S KIG MYP)  
62,100-450-69-B-40

### ROANOKE DIVISION

#### North Carolina

W4VHH. 69,370-500-56-A-37  
W4BDU. 40,700-370-55-B-39  
W4YWB. 16,144-158-41-A-13  
W4IZR. 15,134-162-47-B-20  
W4RTZ. 12,000-150-32-A-24  
W4ZPD. 9,824-147-29-A-21  
W4EUL. 3,881-61-27-A-17  
W4YBU. 165-16-12-A-5  
W4NGJJ. 236-13-9-A-12  
W4BNX. 180-9-8-A-4  
W4BUU. 10-2-2-A-1  
W4EXU (W4S EU SDW  
SWC) 14,592-198-38-B-15

#### South Carolina

W4TL. 68,741-404-69-A-37  
W4QGE. 43,390-238-66-A-29  
W4FGX. 37,125-295-54-A-33  
W4GCB. 20,500-41-20-A-9

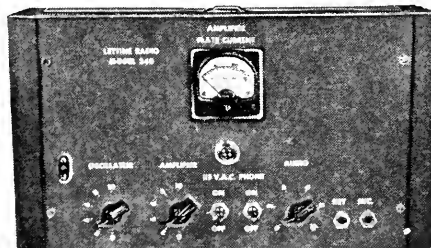
#### Virginia

W4KFC. 203,850-1137-72-A-40  
W4PNK. 129,634-753-69-A-40  
W4RZE. 115,005-698-66-A-34  
W4HJL. 109,400-646-68-A-33  
W4CXA. 105,680-666-64-A-30  
W4XHL. 101,170-604-67-A-38  
W4JAT. 92,880-516-72-A-35  
W4IA. 91,840-575-64-A-36  
W4JUQ. 87,360-635-56-A-13  
W4TBR. 84,444-539-65-A-40  
W4CC. 83,985-509-66-A-25  
W4YKO. 76,246-569-67-B-3  
W4KXV. 67,084-402-67-A-22  
W4SNH. 66,640-476-56-A-35  
W4AMZ. 60,288-371-65-A-40  
W4GFC. 44,440-352-57-A-30  
W4WBC. 41,596-282-59-A-33  
K4AQU. 39,260-302-52-A-40  
W4HQN. 38,150-273-56-A-3  
W4WRM. 34,437-282-50-A-36  
W4JXN. 29,778-272-43-A-36  
W4YON. 28,275-290-39-A-32  
W4VTR. 26,614-227-47-A-25  
W4FPX. 26,028-245-54-B-31  
W4JHK. 25,645-225-46-A-10  
W4CIT. 23,895-266-36-A-24  
W4EJ. 23,400-195-48-A-29  
W4KX. 21,070-215-49-B-11  
W4FZG. 20,604-202-51-B-11  
W3FKA. 19,530-217-36-A-28  
W4TFX. 18,169-162-45-A-11  
W4APM. 17,937-175-41-A-13  
W3EJL. 17,520-146-48-A-13  
W4CHR. 16,008-137-67-A-18  
W4AJJ. 15,181-176-35-A-21  
W4DNB. 14,800-152-40-A-19  
W4NAD. 10,725-130-33-A-12  
W4JUJ. 10,076-115-44-B-10  
W4ZCL. 8,540-107-44-A-15  
W4CHR. 8,122-132-31-B-15  
W4VIO. 6,720-101-28-A-19  
W4DNQ. 4,860-84-24-A-8  
W6LON. 4,420-85-20-A-8  
W4JWL. 4,050-60-27-A-6  
K4ATD. 3,485-59-30-A-15  
W4BXL. 3,319-55-25-A-14  
W4CRG. 2,475-50-21-A-5  
W4NDNC. 2,475-47-22-A-17  
W4ASJ. 2,150-43-20-A-8  
W4RTV. 1,440-32-18-A-2  
W4KTL. 1,046-33-11-B-8  
W4MH. 719-33-11-B-8  
W4JLS. 473-21-9-A-5  
W4JLV. 270-14-8-A-5  
W4GLH. 154-11-7-B-1  
W4RQ. 150-10-6-A-2  
W4BZX. 125-10-5-A-3  
KN4AT. 3-1-1-A-1

(Continued on page 134)

## XMTRS FOR 160 TO 2 METERS

or Special Freq. 500 KC. to 160 MC.



### LETTINE MODEL 240 TRANSMITTER WITH MOBILE CONNECTIONS AND A.C. POWER SUPPLY

This outstanding transmitter has been acclaimed a great performer throughout the world. Air wound plug-in coils used for high efficiency. Takes any freq. from 1.6 to 30 mc. Ideal for General Class, Novice, CAP, CD, Industrial. Sold direct from our factory, ready to operate. 40 to 50 watts input, 1-Phone-CV. Complete with 8 x 14 x 8 cabinet, 40 meter coils, xtal, tubes: 6V6 osc., 807 final, 5U4G rect., 6XJ7 xtal mike amp., 6N7 phase inv., 2-6L6's PP mod. Wt. 30 lbs. \$79.95. 80, 20, 10 meter coils \$2.91 per band, 160 meter coils \$3.60. MODEL 130 FOR 120 TO 130 WATTS — \$199.50

MODEL 242 FOR 2 METERS — 45 WATTS INPUT — 6146 FINAL. Complete with mobile connections, A.C. power supply, tubes, xtal, xtal mike input. Uses 8 mc. xtals. Swinging link matches 52 — 300 ohm antennas. Same cab. as 240. \$89.95. Also 6 meter model.

150 WATT ANT. TUNER matches any antenna, 8 x 10 x 8 cab. \$20.00. Coils extra: 160 — \$4.30, 80 — \$3.45, 40 — \$2.73, 20 — \$2.40, 10 — \$2.31.

VFO FOR ANY OF ABOVE TRANSMITTERS — \$49.95  
Send full amount or \$25 with order — balance C.O.D.

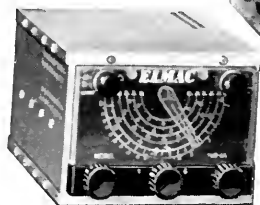
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# WE HAVE A MOBILE RIG FOR ANY CAR!



**ACT NOW!** We have all **MULTI-ELMAC** products in stock including a new mounting rack. Order your mobile rig now, insure immediate delivery.



## MULTI-ELMAC

AF-67 TRANS-CITER.....net \$177.00  
PMR-6A RECEIVER.....net \$134.50

## POWER SUPPLIES FOR PMR-6A

PSR-6 For 6 volt operation.....net \$24.50  
PSR-12 For 12 volt operation.....net \$24.50

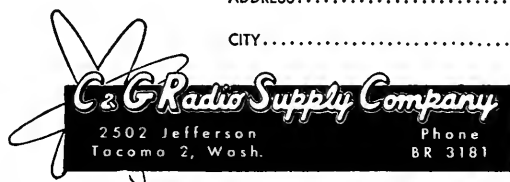
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I want to trade in my .....

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ADDRESS.....

CITY.....ZONE.....STATE.....



**PLEASE MAIL QUOTATION**

**NO OBLIGATION**

# Proven Performance



**MODEL  
CD-2  
FCDA  
APPROVED**



## DOUBLE CONVERSION RECEIVER PLATE MODULATED P.P. FINAL

- Available for 2 Mtrs. or 6 Mtrs.
- Designed for CD, Fixed or Mobile
- Your complete CD station

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OF MANY STATES**

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W4YE (W4s YE YZC) 32,960-611-68-B-1  
W4YZC (W4s YE YZC) 67,904-532-64-B-1  
W4ZYV (W4s ASJ ZYV) 963-28-14-A-7

### West Virginia

WSPQ... 52,488-365-72-B-30  
W8UMR... 47,515-280-68-A-25  
W8TDG... 41,976-318-66-B-27  
W8JWN... 39,043-341-46-A-33  
W8UYR... 33,064-294-57-B-28  
W8KDJ... 30,160-212-58-A-16  
W8HZA... 28,951-219-53-A-16

### ROCKY MOUNTAIN DIVISION

#### Colorado

W0EWH... 79,275-453-70-A-30  
W0CYT... 65,835-418-64-A-32  
W0IC... 63,998-372-69-A-23  
W0SJT... 49,630-358-56-A-39  
W0ANW... 40,975-304-55-A-36  
W0JPI... 35,945-285-52-A-27  
W0RDM... 21,675-172-51-A-29  
W0BON... 48,96-70-36-B-10  
W0PGN... 43,88-61-30-A-15

#### Utah

W7QDM... 85,844-523-67-A-40  
W7QDJ... 59,440-373-64-A-30  
W7CCC... 46,160-292-64-A-20  
W7RRJ... 30,533-207-59-A-20  
W7WLD... 184-13-7-A-10

#### Wyoming

W7IHM... 69,438-490-71-B-27  
W7PSO... 49,995-304-66-A-29  
W7UFB... 10,725-100-44-A-15  
W7PMA... 6,660-74-36-A-14  
W7TPX... 6375-88-30-A-18  
W7RVO... 4200-56-30-A-9

### SOUTHEASTERN DIVISION

#### Alabama

W4RAL... 64,654-413-63-A-32  
W4CEB... 56,935-404-59-A-38  
W5ONL... 50,447-333-61-A-23  
W4WOG... 31,655-154-65-B-24  
W4YRO... 18,213-156-47-A-26  
W4FMW... 15,435-126-49-A-17  
W4DGP... 14,663-178-34-A-1  
W4ZSH... 7,942-107-38-B-18  
W4DGY... 5,425-82-28-A-31  
W4TKL... 4,462-21-11-B-3  
W4CIU... 315-14-9-A-6

#### Eastern Florida

W4LVV... 101,756-612-67-A-40  
W4WEK... 70,294-470-65-A-40  
W4LOM... 73,725-411-65-A-21  
W4RTN... 37,763-265-57-A-20  
W4DXL... 26,624-260-52-B-28  
W4BCE... 18,138-119-31-A-29  
W4IYT... 4,290-65-33-B-4  
W4DFU (W4s CKB OG) 41,020-300-56-A-22

W4WEC (W4s WEC YSE) 34,775-280-52-A-34  
W4AGK (W4s AGK UHC) 8512-115-38-A-32

#### Western Florida

W4WKQ... 109,743-672-66-A-40  
W4ZAE... 75,904-600-64-B-35  
W4CHZ... 47,198-326-58-A-29  
W4BIJ... 10,761-106-51-B-13

#### Georgia

W4FCB... 62,712-436-72-B-31  
W4BQF... 25,573-193-53-A-30  
W4YK... 16,320-120-68-B-18  
W4BYJ... 13,493-132-42-A-18  
W4BXV... 8,168-101-53-A-9  
W4GGD... 73,600-444-67-B-8  
W4GSP... 4538-67-30-A-26  
W4WRY... 1063-26-17-A-6

#### West Indies

KP4AAC... 31,625-232-55-A-33  
KP4DJ... 25,700-259-50-B-23  
KP4ZW... 23,459-198-49-A-32  
KV4BK... 11,025-105-42-A-19

#### Canal Zone

KZ5NB... 4900-57-35-A-17

### SOUTHWESTERN DIVISION

#### Los Angeles

K6CEF... 130,123-714-73-A-38  
W68BB... 89,016-663-69-B-38  
W6FLD... 86,423-501-49-A-36  
W6HJS... 73,700-444-67-B-8  
W6MUR... 73,000-500-73-B-18  
K6AUZ... 51,450-294-70-A-28  
K6GLS... 48,128-314-62-A-37  
W6NKR... 39,488-312-64-B-19

K6BWD... 38,625-258-60-A-39  
K6ASL... 30,625-250-49-A-26  
W6UDY... 22,612-201-45-A-24  
W60EA... 17,494-156-45-A-21  
W6ACL... 15,730-143-44-A-29  
W6MBW... 15,566-181-43-B-19  
K68SP... 11,563-125-37-A-23  
W6JKR... 9,967-128-39-B-9  
W6UIC... 8,514-99-43-B-9  
K6EVR... 8,229-114-29-A-46  
K6CUN... 7,576-106-29-A-10  
K6BN... 6,743-94-29-A-26  
W6LNY... 6,662-66-32-B-8  
K6EVL... 5,168-76-34-B-16  
K6ELN... 4,938-63-25-A-29  
K6BFC... 3,200-82-16-A-17  
W6FEB... 3,120-60-26-B-8  
K6DNH... 3,105-55-23-A-13  
W6RNA... 2,900-50-28-B-8  
K6DGX... 2,795-112-13-B-26  
W6LIT... 2,475-56-18-A-5  
K6CHQ... 2,063-33-25-A-5  
K6DQA... 1,675-35-20-A-11  
W6LNY... 1,463-14-15-A-22  
W6ZON... 25-19-A-3  
K6CDW... 764-25-13-A-5  
K6GPK... 260-15-8-A-8  
K6NHA... 260-13-8-A-9  
K6DDO... 119-10-5-A-8  
K6CXF (K6CXF, K6DID) 2280-50-19-A-23

#### Arizona

W4KMF/782,800-499-69-A-35  
W7RZQ... 71,020-425-67-A-37  
W7LYE... 9,799-106-39-A-25  
W7ZEP/7... 3,770-58-26-A-7  
W7SX... 3,220-60-28-B-6  
W7PUV... 259-12-9-A-3  
W7VMP (W7s VMO VMP) 74,621-532-71-B-40

#### San Diego

W6EPZ... 142,076-779-73-A-36  
K6AM... 59,850-401-60-A-4  
W6JVA... 40,275-273-60-A-40  
W6CJT... 26,000-200-65-B-21  
W6LJQ... 24,290-174-56-A-15  
W6BGC... 17,531-129-55-A-20  
K6AQO... 13,755-132-42-A-15  
K6DNL... 11,475-131-36-A-25  
K6EQL... 11,055-134-33-A-12  
K6EBH... 8,162-38-18-A-8  
W6KXN (W3s SLQ VOL) 71,967-539-69-B-40  
K6DGB (W6DGB, K6DGB) 43,500-303-58-A-4

#### Santa Barbara

W6ULS... 119,653-659-73-A-40  
W6YK... 71,358-397-73-A-40  
K6ASB... 56,270-332-68-A-35  
K6CST... 25,688-248-52-B-38  
W6BOK... 18,741-160-47-A-22  
W6RRK/6... 5,063-82-25-A-17  
W6EIO... 4,725-67-28-A-10  
K6CKU... 3,465-78-18-B-7  
W6SN1... 1,314-37-18-B-6

### WEST GULF DIVISION

#### Northern Texas

W5TFB... 152,479-836-73-A-40  
W5BJA... 101,948-593-69-A-40  
W5CCK... 82,283-496-69-A-40  
W5CAY... 59,520-400-64-A-35  
W5CUO... 55,025-355-62-A-27  
W5HIM... 54,810-435-63-B-31  
W5OC... 54,750-366-60-A-32  
W5LOI... 42,750-280-62-A-25  
W5VNW... 38,220-333-60-B-37  
W5QF... 30,690-249-62-B-26  
W5AEV... 27,685-230-49-A-29  
W3BOU/5... 23,490-177-54-A-27  
W5AHC... 26,434-205-53-A-25  
W5EGX... 5,616-80-36-B-10  
W5HIS... 2,719-81-25-B-10  
W5ZWR... 2,125-34-25-A-5  
W5ZOY... 1,825-39-20-A-6  
W5FTD... 1,240-31-16-A-7  
W5NGNE... 840-24-14-A-18  
W4TRY/5... 349-16-9-A-4

#### Oklahoma

W5WZV... 41,120-257-64-A-27  
W5NZJ... 38,080-344-56-B-37  
W5QZF... 11,250-100-45-A-19  
W5BBB... 5,591-115-37-A-21  
W5CCT... 4,857-11-47-B-9  
W5LPL... 7,695-83-38-A-14  
W5VBI... 160-9-8-A-4  
W5BCJ... 55-7-4-A-4  
W5BDL (W5s BDL CKT) 6552-78-42-B-15

#### Southern Texas

W5WQN... 121,440-704-69-A-40  
W5BTS... 114,188-661-70-A-40  
W5ZD... 96,769-596-65-A-40  
W5B1... 18,441-158-41-A-14  
W5ZC... 1,900-59-35-A-15  
W5AKS... 4,865-70-28-A-22  
W5YXW... 2,028-40-26-B-9  
W5AER... 630-21-12-A-3  
W5GQN... 300-16-8-A-18

(Continued on page 136)

**Shakespeare WHIP ANTENNA**

Pat. Applied for

actually out performs metal whips

- will not corrode
- high flexural and impact strength
- will not take a set
- light weight
- excellent insulation even at high frequencies

**Shorter resonant length**  
Made by the pioneer manufacturer of FIBERGLASS fishing rods. Industrial applications solicited

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Whips: 54"—\$5.75 90"—\$6.95  
Base Extensions: 18"—\$3.95 36"—\$4.70  
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# 8-TUBE SYLVANIA FM-AM CHASSIS

- ★ 7 UV. FM SENSITIVITY!
- ★ AC CIRCUIT SUPPLY!
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★ EASILY CONVERTS TO TUNER, WE SHOW HOW!



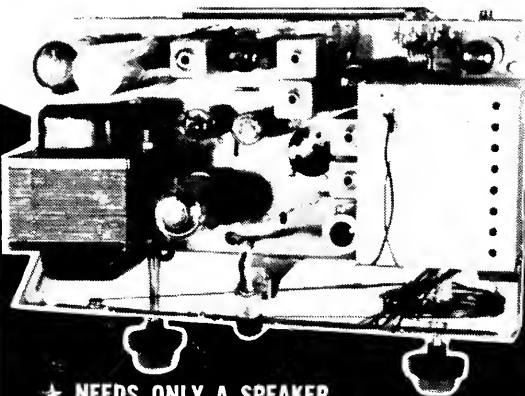
**OVER \$31<sup>95</sup>**  
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EXCLUSIVE IN EASTERN U.S.A. AT RADIO SHACK, this brand new famous-make Sylvania chassis is the buy of '55 at a price less than a common garden variety ac/dc FM-AM radio! The straight AC circuit with transformer power supply allows conversion — if desired — to tuner with 71c-worth of parts (listed below) and our SIMPLE instructions which are INCLUDED with every set. To operate at once, attach ANY speaker having 3.2 ohm voice coil impedance.

SPECIFICATIONS INCLUDE: dual concentric controls; volume-power/tone, and FM-AM-Phono/Tuning. Tone control: flat center position and continuous from bass boost through treble drop — an important feature! Lab-checked excellent sensitivity of 7 microvolts for 30 db quieting — very fine figure.

Untuned RF stage on FM, shielded condenser gang, ratio detector circuit will operate with only a 4 ft. piece of hookup wire in local areas; provision for external antenna. Spare fuses AC receptacle on rear for phono motor. AC power transformer AND 3.2 ohm output transformer! AM loop. Includes instructions, schematic diagrams, conversion to tuner procedure for feeding external amplifier, lucite escutcheon which edge-lights by pilot lamp. IMPORTANT: circuit is AC — not AC-DC — and employs 8 tubes: two 6AU6, 6BE6, 6BA6, 6AL5, 6AT6, 6W6GT output, 7Z4 rectifier tube. Overall size: 10 1/4" wide, 5 1/2" high less escutcheon, 6 1/2" deep (8" with knobs). Ship. wt. 15 lbs.



★ NEEDS ONLY A SPEAKER  
TO USE IMMEDIATELY!

## PRICE LIST AND ACCESSORIES:

Order No.	Description	Wt.	Net
R-4244	8-Tube FM-AM Chassis	15 lbs.	\$31.95
R-8161	Special 4" Speaker	1/2 lb.	1.25
31-593F	8" Speaker	2 1/2 lbs.	3.45
15-016F	V-M Intermix Changer	12 lbs.	30.22
09-179F	5-Ohm 10-Watt Resistor*	2 oz.	.44
30-517F	3 ft. Audio Cable*	6 oz.	.27
30-517F	5 ft. Audio Cable*	6 oz.	.34

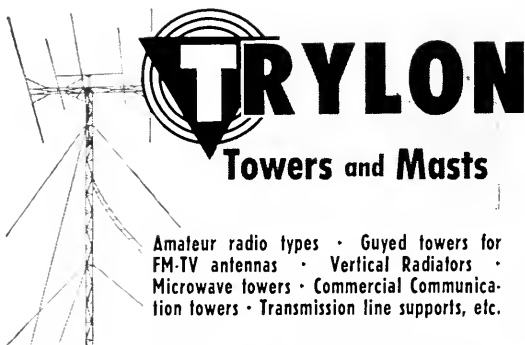
\*For conversion to tuner. Choose 3 or 5 ft. cable.

## Radio Shack Corporation

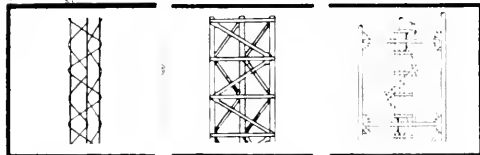
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230-234 Crown Street, New Haven 10, Connecticut





Amateur radio types • Guyed towers for FM-TV antennas • Vertical Radiators • Microwave towers • Commercial Communication towers • Transmission line supports, etc.



#### SERIES 650

Height to 80'  
Width—6.5"  
10' section—  
22 lbs.

Use—Mast for TV  
Amateur, Port-  
able, and Wire  
type antennas

#### SERIES 2400

Height to 280'  
Width—22.6"  
10' section—  
112 lbs.

Use—Tower for  
Trylon Rotary  
Beam, AM  
Broadcast, and  
Microwave  
antennas

#### SERIES 6000

Height to 600'  
Width—60"  
10' section—  
653 lbs.

Use—TV Broad-  
casting and  
curtain antennas  
for International  
Broadcasting

\* Between CG of Tower Legs

Trylon Towers are made only by

**WIND TURBINE CO., WEST CHESTER, PA.**

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MT-5B D-X MITTER

6 Band

Bandswitching



5" x 8" x 7"

Vibration-Proof, Shock-Proof

New exclusive meter, D'Arsonval movement, new crystal oscillator circuit using 6CL6 tube, VFO-XTL crystal switch and VFO connector now on panel. Same professional performance and fine quality as found in Babcock military radio equipment. Constant solid signal, every tube, every part tied down. Lifetime gray Hammertone metal case, easy to install. Examine—compare—buy Babcock!

Price complete with tubes, plugs and instruction book, Ham net. . . **\$119.50**

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WN5FAO	26-	5-	3-A-4
W5YXH (W5E EGD YXH)	68,805-	417-66-	A-46
<i>New Mexico</i>			
W5QNZ	126,936-	887-72-	B-38
W5YRP	111,240-	621-72-	A-38
W5CA	48,675-	300-66-	A-20
W5KWP	41,111-	290-57-	A-28
W5QVZ	23,484-	206-57-	B-30
W5UWA	10,880-	136-40-	B-17
W5AWN	4675-	36-34-	A-13
W5YKB	864-	27-16-	B-3
WN5FHL	10-	2-	2-A-2

## CANADIAN DIVISION

### Maritime

VE1AR	103,850-	678-62-	A-39
VE1AAY	83,555-	492-68-	A-37
W4KYM/VO6	24,439-	172-57-	A-27
VO6N	13,140-	146-36-	A-40
VO6U	2444-	43-23-	A-6
VE1CU	2243-	39-23-	A-4
VO6AH	510-	18-12-	A-11

### Quebec

VE2BX	56,560-	405-56-	A-36
VE2PZ	20,746-	228-46-	B-20
VE2ADD	8514-	100-49-	B-14
VE2CB	5303-	102-21-	A-10
VE2CP	3750-	60-25-	A-7
VE2OL	2940-	56-21-	A-4

### Ontario

VE3AUU	62,235-	474-54-	A-38
VE3QE	61,596-	522-59-	B-39
VE3ACB	55,770-	338-66-	A-33
VE3DRD	50,540-	370-56-	A-36
VE3DBP	44,451-	419-43-	A-38
VE3EAM	44,033-	309-57-	A-37
VE3BNF	26,069-	243-43-	A-27
VE3BHS	25,650-	181-57-	A-28
VE3EAU	20,470-	178-46-	A-20

<sup>1</sup> W3ULI, opr.; <sup>2</sup> W3PST, opr.; <sup>3</sup> K2IKS, opr.; <sup>4</sup> W2BRA, opr.; <sup>5</sup> W3CEL, opr.; <sup>6</sup> Hq. Staff, not eligible for award; <sup>7</sup> W1QIS, opr.; <sup>8</sup> W3PZW, opr.; <sup>9</sup> K17AKE, opr.; <sup>10</sup> K6BBD, opr.; <sup>11</sup> W0HAW, opr.

VE3YV	18,408-	177-52-	B-24
VE3BUR	18,170-	154-42-	A-12
VE3BJV	14,153-	170-34-	A-26
VE3AVS	13,867-	142-49-	B-22
VE3DQX	4550-	91-20-	A-5
VE3DFE	4025-	58-28-	A-12
VE3DME	2703-	49-23-	A-12
VE3BSW	2520-	51-21-	A-9
VE3AR	2125-	34-4-	A-3
VE3DLS	935-	22-17-	A-9
VE3DSG	20-	4-2-	A-4
VE3DNC	715-	3-2-	A-1
VE3UOT (VE38 AQO DAF)	21,244-	227-47-	B-20

### Manitoba

VE4MX	45,900-	312-60-	A-30
VE4GB	2610-	47-29-	B-10
VE4MT	1140-	31-16-	A-6
VE4SU	768-	25-16-	B-8
VE4HS	420-	15-14-	B-4
VE4ER	75-	6-5-	A-1

### Saskatchewan

VE5CW	44,756-	337-67-	B-25
VE5DZ	25,315-	218-61-	B-36

### Alberta

VE6ZR	42,776-	283-61-	A-34
VE6NX	33,973-	231-60-	A-22
VE6CE	20,295-	186-44-	A-34
VE6AJ	14,500-	149-50-	B-26
VE6OS	11,655-	131-36-	A-21
VE6SN	8750-	105-35-	A-31
VE6HM	1825-	37-20-	A-11
VE6VG	1781-	48-15-	A-14
VE6TY	1260-	35-18-	B-5
VE6KW	561-	26-11-	B-4
VE6AL	260-	13-8-	A-3

### British Columbia

VE7ZK	62,245-	422-59-	A-32
VE7YU	45,988-	283-65-	A-29
VE7MW	42,413-	306-58-	A-30
VE7QC	26,190-	244-54-	B-28
VE7AC	18,571-	190-49-	B-2

## Beginner's Receiver

(Continued from page 32)

choke lead. Four leads are brought out from the power supply to connect to the receiver: the two heater leads, the B+ lead, and the B- lead.

When the power supply is wired and the leads connected to the receiver, the unit is ready for testing.

### Testing and Using the Receiver

If you already have an antenna strung up, connect the end of it to Terminal 2—the one connected to the rotor of C<sub>1</sub>. If you don't have an antenna, any wire, 20 to 40 feet long or longer, can be strung up. An outside antenna will perform better than one indoors, although you'll hear plenty of signals with a wire just strung around the room.

Connect your headphones to the tip jacks and plug in the 80-meter coil. Plug the power cord into the 115-volt a.c. line and watch the 6US to see if the heater lights up. If it doesn't, turn off the power and check your wiring from the power supply to the heater pins, 4 and 5, on the 6US socket.

The receiver will only take a minute to warm up. Turn the regeneration control and, at one point, you should hear a change in the characteristic of the noise. This is the point where the receiver starts to oscillate. Tune the general-coverage condenser slowly and you should hear signals. Leave the capacitor set at or near one

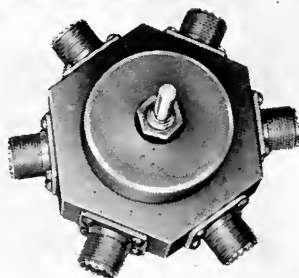
(Continued on page 138)



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**PRICE:**  
**Model 550**  
**\$13.65**

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- **USES 6BZ7, 2 — 6CB6, 2 — 6J6 tubes. COMPLETE** with plugs, tubes and crystal. . . . . \$42.50
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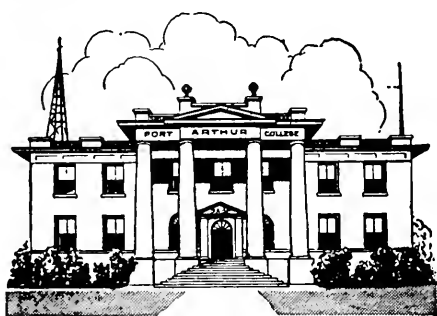
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**PORT ARTHUR COLLEGE** **PORT ARTHUR TEXAS**

Approved for G. I. training

### Parts List for Regenerative Receiver

- 2 100- $\mu$ f. midget variable capacitors (Millen 20100) ( $C_1, C_2$ )
- 1 15- $\mu$ f. midget variable capacitor (Millen 20015) ( $C_3$ )
- 1 100- $\mu$ f. mica or ceramic capacitor
- 3 0.001- $\mu$ f. disk ceramic capacitors
- 1 0.01- $\mu$ f. disk ceramic capacitor
- 1 0.01- $\mu$ f. 250-volt paper capacitor
- 1 10- $\mu$ f. 25-volt electrolytic capacitor
- 2 16- $\mu$ f. 250-volt electrolytic capacitors (or dual 16- $\mu$ f.)
- 1 470-ohm 1/2-watt carbon resistor
- 1 68,000-ohm 1-watt carbon resistor
- 1 0.1-megohm 1/2-watt carbon resistor
- 1 0.5-megohm 1/2-watt carbon resistor
- 1 1.0-megohm 1/2-watt carbon resistor
- 1 50,000-ohm potentiometer
- 2 1-mh. r.f. chokes (National R-50)
- 80-, 40-, and 20-meter Barker & Williamson Baby Inductors MEL ( $L_1, L_2$ )
- 1 interstage transformer (Stancor A-53-C) ( $L_3$ )
- 2 6-henry 40-ma. filter chokes (UTC R-55) ( $L_4, L_5$ )
- 1 power transformer, 120-volt secondary at 50 ma.; 6.3 volt at 1 amp. (Merit P3045 or P3046, or equivalent)
- 1 selenium rectifier, 130 volts, 20 ma. (Federal 1159) ( $CR_1$ )
- 1 aluminum chassis, 7"  $\times$  7"  $\times$  2"
- 1 aluminum panel, 7"  $\times$  6"
- 1 piece of aluminum for power-supply chassis, 3" by 10" (the panel and this piece are obtainable at any sheet-metal shop)
- 1 9-pin miniature tube socket, bakelite or mica filled
- 1 5-pin socket for coils  $L_1$  and  $L_2$ , bakelite or isolantite
- 4 3-terminal tie points
- 7 3/8" rubber grommets
- 1 Panel bearing assembly, over-all length 6"
- 1 insulated shaft coupler
- 1 terminal strip, 5 terminals
- 2 pin jacks, insulated type
- Miscellaneous 6-32 machine screws and nuts
- 6 ground lugs
- 25 feet of hook-up wire
- 4 knobs for controls (In the unit shown, a National type K dial was used for bandspread.)
- 1 6US tube
- 1 length of spaghetti wire covering
- Line cord and plug

of the signals and then tune the bandspread capacitor. This capacitor gives a slower tuning rate, making it much easier to tune in signals.

With a signal tuned in, rotate the antenna-trimmer control and the signal should get louder at one point. If it doesn't, change the antenna to terminal number 1 and short terminals 2 and 3 together with a short piece of wire. Try the antenna trimmer again, and you should find that the signal will peak up. The regeneration control setting may have to be changed to maintain oscillation.

Locating the amateur Novice bands is simple. Tune the receiver until you find an amateur 'phone station. The Novice band on both 80 and 40 meters is immediately below the 'phone bands. To tune lower in frequency than the 'phone bands, the bandspread capacitor is turned so that the capacitance increases, or the plates mesh.

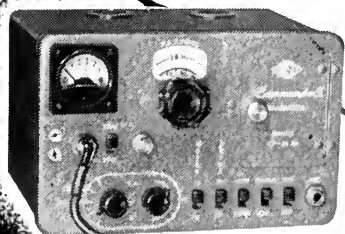
The beginner will find great satisfaction in completing the receiver and many happy hours of listening will be his for the asking.

**"COMMANDER"** Power inputs up to 60 watts A.M. ....  
Continuous coverage from 160 .... including 6 meters

#### COMMANDER

.....an extremely compact and versatile transmitter, advanced in design, modern in circuitry. It covers a continuous frequency range from 1.7 to 54 mcs and may be operated xtal control as-is or with the Gonset VFO. A 6146 output tube and two 7C5's as modulators permit plate voltages of 400 to 500 volts—inputs, (modulated) to 50 watts. Two high Q coils provide

SIZE: 5 $\frac{3}{8}$ " high,  
 8 $\frac{1}{2}$ " wide,  
 7 $\frac{1}{8}$ " deep.



coverage of 75-40-20-15-11 and 10 meter amateur bands and are readily changed from front of housing. The output circuit eliminates loading problems frequently present with pi networks where the load is a short, loaded mobile antenna. Circuit also couples into balanced or unbalanced lines, can be quickly

converted to "Pi" or "L" networks by simple wiring change. Driver is bandswitched. The Commander uses any standard carbon or PA-type dynamic or crystal microphone. No preamp required.

An excellent VFO is available as a companion unit for the Commander. This is an extremely stable, low drift unit and uses no tubes—requires no operating voltage—coax cable, (furnished) plugs into fitting on Commander panel. Unit covers 75-40-20-15-11-10 meter amateur bands. Very rugged and compact—can mount next to transmitter or on steering column.

COMMANDER (with tubes) . . . Net 124.50

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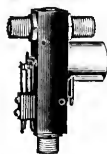
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1000 WATTS  
Length 4 1/2",  
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Special connector protects your receiver from R.F. during transmission (Optional).

Silent AC magnet prevents hum modulation of carrier — AC types guaranteed as quiet as DC.

Transmit contact-pressure over 75 grams, making the 1000 w. rating very conservative. Causes negligible change in SWR up to 100 Mc.

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See your distributor. If he has not yet stocked Dow Co-axial relays, order from factory. Send check or money order or will ship COD. Prices net FOB Warren, Minn. Shipping Weight 9 oz. Dealers' inquiries invited. Literature on request.

Add \$1 for external switch (Optional)

Add \$1 for special receiver protecting connector (Optional)

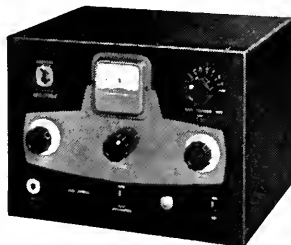
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(Continued from page 51)

KN2HVM.....1633- 71-23-20  
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KN2ITZ.....1100- 40-20-11  
KN2HKG.....663- 24-17-16  
KN2KER.....234- 18-13- 4

### Northern New Jersey

KN2JLQ.....5070-120-39-38  
KN2KDW.....4928-139-32-31  
KN2KEP.....4625-125-37-30  
KN2JOM.....3510-130-27-16  
KN2HFI.....3078-114-27-19  
KN2JMX.....1428- 68-21-14

### Nebraska

WN0VKI.....16,225-295-55-33  
WN0WLO.....6600-135-44-36  
WN0WSN.....4104-114-36-36  
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KN2INQ.....90- 10- 9- 3  
KN2KDG.....82- 22-36-36  
KN2KLR.....6- 3- 2- 1

WN1CDD.....2580- 71-30-30  
WN1CDC.....1978- 76-23-24  
WN1DIE.....1140- 52-20-28  
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WN0WPM.....2924- 86-34- 5  
WN0UJD.....1988- 56-28-14  
WN0WNE.....940- 47-20-13  
WN0UJF.....656- 31-16-16  
WN0WDK.....225- 15- 9-23  
WN0SZW.....132- 7- 6-10  
WN0WEX.....85- 17- 5- 6  
WN0TLQ.....66- 11- 6- 2

### Kansas

WN0UZM.....2232- 72-31-23  
WN0VGE.....322- 23-14-15

### Missouri

WN0UVH.....525- 20-15-24  
WN0VVY.....228- 19-12- 5

### Maine

WN1BCD.....2323- 86-23-13

### Eastern Massachusetts

WN1CFF.....4050-120-30-40  
WN1ZUM.....2046- 78-22-14  
WN1BPW.....1302- 52-21- 8  
WN1BVP.....702- 39-18- 8  
WN1COL.....608- 38-16- 6  
WN1CCM.....518- 37-14-23

### Western Massachusetts

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WN1BYH.....1235- 50-19-15

### Rhode Island

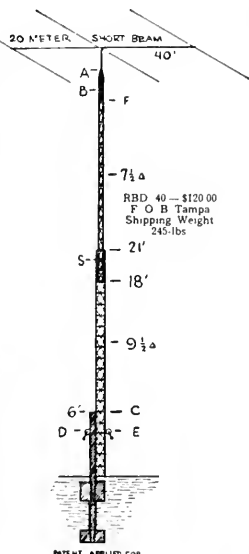
WN1BIS.....3753-134-27- 9  
WN1CGZ.....893- 47-19-11

(Continued on page 142)

# THE ANSWER TO A HAM'S DREAM!

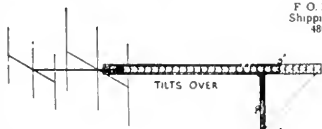
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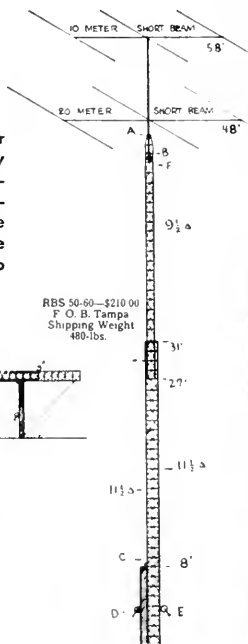


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WN7YHS.....168- 9- 7- 3  
WN7VQX.....126- 21- 6- 5

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WN7WGI.....660- 44-15-17  
WN7WKA.....210- 11-10-12

### Virginia

KN4ASU/4.....3078- 79-27-18  
WN4HVA.....1407- 67-21-38  
WN4FKP.....435- 29-15- 9  
KN4ADJ.....360- 24-15- 7  
WN4EZB.....108- 8- 6- 3

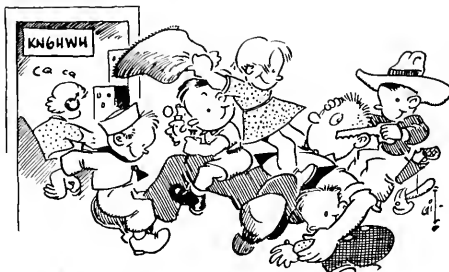
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WN3SWX.....969- 42-17-25

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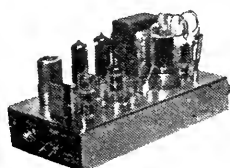
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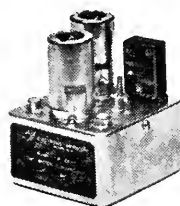
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## Correspondence

(Continued from page 54)

meters. This is a problem for the Novices who are located near the Canadian border. Also, many Novices are not financially able to buy a super-selective receiver at the first chance. Each 'phone station takes up more room than a few c.w. stations. If the 'phone station is stronger than the c.w. station, it will blank it out. Furthermore, since Novices are crystal-controlled, they are not able to change frequency so readily when 'phone or other QRM appears.

— George Hippisley, KN2KIR

202 N. High St.

Mt. Vernon, N. Y.

Editor, QST:

I wish to take issue with the viewpoints taken by Messrs. Clark and Brogdon in March QST. Both of these letters seem to indicate signs of the so-called "progressive" viewpoint prevalent in amateur circles.

I agree with Mr. Clark in condemning the use of c.w. in the 'phone bands; it is definitely an ungentlemanly practice. But the reason is not that c.w. was here first. The same argument could be applied to argue that spark was here first so it should be allowed. As has been pointed out before, c.w. is necessary in case of communications emergency or breakdown of speech equipment, so it is necessary to have c.w. allowed everywhere (on the hambands that is). This does not give c.w. operators the right to use normally-assigned 'phone channels, the reason being courtesy to the 'phone men.

Mr. Brogdon carries his "progressive" ideas a bit too far. Granted that "sideband" is a more efficient form of communication. But how many, in spite of the technical niceties, are on s.s.b. compared to those on double-sideband? For that matter, a kilowatt is technically superior to 50 watts for reliability and readability of communication but are 50-watt rigs outlawed? The factor that makes for outlawing something should be the will of the majority of hams, not how closely some new system approaches perfection.

— Karl Felperin, W2FSJ

R. D. No. 2, So. Side  
Oncota, N. Y.

Editor, QST:

... I too came up through the Novice ranks; I too am disgusted with the shenanigans to be heard on the 75-meter 'phone band; but please, I say please, don't ask for five hundred kilocycles of unidentified carriers, sloppy splatter-band operators, etc. ... Admitted, there are always a few c.w. signals to be found in the 'phone bands, also admitted that there are quite a few lids running "kilowatts." Nothing has sounded as jolly as the character from Ohio heard for several evenings calling "CQ eighty" on the so-called wide-open c.w. portion of the band!

As you have assumed, I am primarily a c.w. man, part Scotch, yes, with a full 25 watts on 80 meters. I wouldn't be caught dead in your end of the band, because I don't have the patience or the experience to make me feel eligible to work a band which I always recall as the Happy-Hunting Grounds for the old-timers of this business.

— W. W. Thompson, W2MTA

## C.W.-BAND S.S.B.

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Alameda, Calif.

Editor, QST:

After reading the pros and cons of a.m. 'phone vs. s.s.b. in the March issue from some of our (ugh) brothers, some of the heated arguments are rather nauseating.

I think both a.m. and s.s.b. definitely have their place in amateur communications if operated properly and I have heard some poor excuses for both. Some operators have the idea that s.s.b. operation eliminates the possibility of TVI, BCI, and even improper operation, but this to me is only an admission of ignorance. I have heard extremely wide signals complaining of the other, while operating close to each other.

The a.m. 'phone men complain naturally about s.s.b. and c.w. signals in the 'phone portions of bands, and I agree with them in many respects, but I think the fault lies with

(Continued on page 146)

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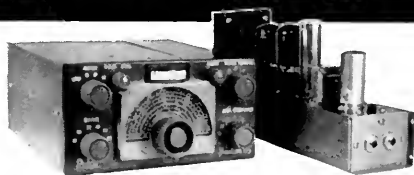
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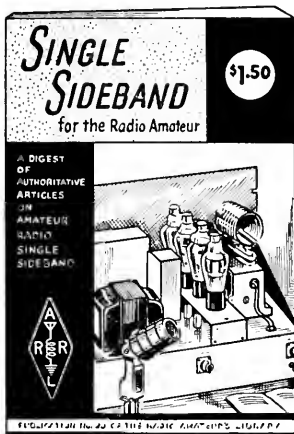
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the FCC in allocating such large portions of the bands to c.w. operation and small portions to the more useful means of communications, a.m. 'phone. If the c.w. and s.s.b. boys continually pat themselves on the back for operating on such small segments then maybe they would like to have less and be forced to operate in what the a.m. boys are using now.

It is my belief that if s.s.b. were forced to operate in separate portions of the band from a.m. they would have many more join them in true progress. The a.m. boys would leave the crowded 'phone segments to enjoy the merits of s.s.b. This may not lay too well on the s.s.b. boys' stomachs at first but think it over boys, it would be wonderful to operate s.s.b. in the c.w. bands. It is a nuisance to try to operate a.m. and have a s.s.b. close in frequency. Also, it must be tough for s.s.b. boys to be repeatedly referred to as "voice modulated key-clicks."

So it all boils down to this: we are not getting any place beating each other on the head, trying to convert a.m. to s.s.b., preaching lengthy sermons over the air, and committing the very act of libel and slander. The only reason for rivalry between s.s.b. and a.m. is because we are guilty as poor representatives and members of ARRL properly to govern ourselves and correctly allocate bands for proper operation. Instead of fighting each other we should exert all our force to allow s.s.b. to operate in the c.w. bands and let the a.m. boys have their segment in peace.

— Jack R. Perciful, W4PDC/6

## THEY CAME, TOO

119 Eustis Avenue  
Newport, R. I.

Editor, QST:

The second paragraph of your editorial in the March issue of QST might lead some to think that amateur affairs were handled by the Federal Radio Commission between 1927 and 1934. However, some of us who originally obtained our amateur and commercial tickets from the Radio Division of the Department of Commerce recall that it was not until July, 1932, that the responsibilities and duties of the old Radio Division were transferred to the FRC.

(Continued on page 148)

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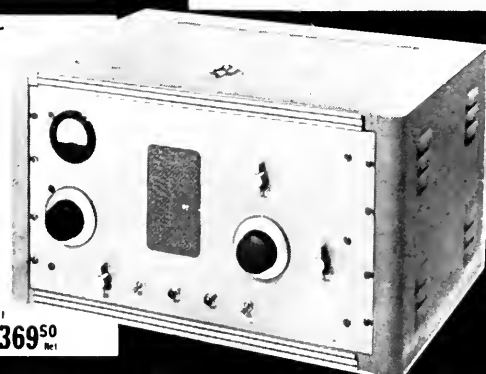
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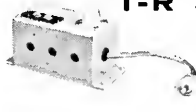


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377	398	420	486	507	530	415	465
379	401	422	487	508	531	416	466
380	402	423	488	509	533	417	468
381	403	424	490	511	534	418	469
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I also recall that originally the FRC was created by Congress in 1927 to bring order out of the chaos in the broadcast field. At that time its life was only going to be for one year, yet like many other Washington agencies that came along later, they imitated the "Man Who Came to Dinner" and picked up additional duties along the way. That is how they got amateur affairs in 1932. Then, in 1934, Congress straightened out the whole thing by creating the Federal Communications Commission.

It is refreshing to read an article that compares today's activities with earlier days.

— Lester C. Harlow, W4CVO/1

[EDITOR'S NOTE — OM Harlow is correct. The story appeared in Sept. 1932 QST.]

## ONE SOLUTION

Rt. 1, Box 825  
Tigard, Ore.

Editor, QST:

... True — there is a lot of QRM these days, but why not solve it nicely instead of trying to either change the rules or shove other amateurs around. Since one of the prides of being an American amateur is to be flexible and help with many new "firsts" in radio, wouldn't the best solution be to improve your own operating techniques first and then try to help the other fellow instead of drowning him out.

Many hams in this area have taken their rigs "upstairs" and are finding a new world in v.h.f.; c.w. for me on 80 and 40, and 'phone on 2 — and you can't ask for better ham radio when you practice good operating principles.

— Jim Strickland, W7SEZ

## YL News & Views

(Continued from page 55)

and OM W4HJH. . . . W5SYL, Iva, was one of some 100 YLs and OMs who assisted in the search for the body of W5DM, pilot of a plane which crashed in Texas. . . . And in Lancaster, Calif., K6HVB, Vivian, stayed on the air for more than 20 hours monitoring, relaying, and keeping 3995 kc. clear during a search for a Douglas jet test pilot on

(Continued on page 150)



Devotees of amateur radio come younger all the time. Here's one chap who was exposed to 75-meter QRM at the innocent age of several hours.

For five days following the birth of son Mark Eric in January, Mildred Drummond, W0GNG, kept three schedules daily with OM W0BWP, Rev. Wesley J. Drummond, pastor of the Second Presbyterian Church, Flandreau, S. Dak. Mildred's transmitted instructions on household matters were dutifully carried out at home by her OM, 11-year-old son John, WN0TLR, and 9-year-old daughter, Darlene.

We note with womanly interest that it is becoming fairly common practice for mothers-to-be to pack a portable transmitter and receiver with a suitcase to take to the hospital for a maternity confinement. Seems opportune for a few days of leisurely(?) QSOing.



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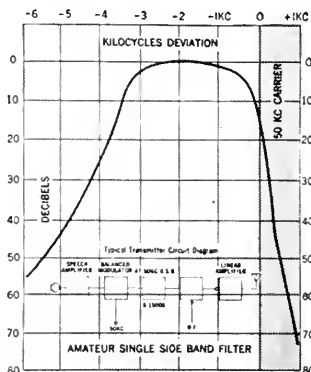
Although the S-15000 is made with the same commercial quality toroids and condensers as employed in the regular BURNELL Commercial Grade Audio Filters,

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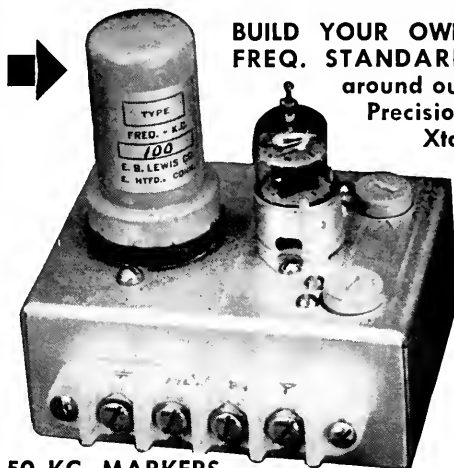
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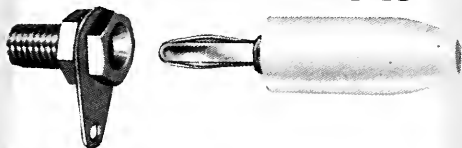
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STRATFORD

NEW JERSEY



Take a teen-ager and her mother, both licensed amateurs, and you can virtually see the mutual pride that exists between them. Add a teen-age brother and a father with tickets, and you have a situation that any therapist would recommend for family happiness. In the case of the Hansen family of Cheney, Wash., mother Rosella, W7ULK, interested in radio for twenty years, got her license first, built a transmitter and started teaching her family. Daughter, son, and husband followed with the calls W7N7s VWU, VWZ, and WVA respectively. An ex-schoolteacher, Rosella has been coaching a number of teen-agers who aspire to become hams. She recently worked her daughter for her 100th QSL and a YL Century Certificate.

Jan. 13th. Twenty-seven amateurs and 11 mobile units helped locate the pilot within 48 hours. . . . K6DEN, Evelyn, is on 20 and 75 'phone regularly from Redwood City. . . . At a March meeting, committee chairman for the first YLRL International Convention gave various progress reports. It was announced that a fashion show would be staged during the luncheon on June 25th. . . . We regretfully note the untimely passing of Neva Josephine Fredenburg, W6YXI, and her husband John, W6VJQ. The couple perished when their automobile collided with another near Alpine, Calif. A charter member of the San Diego YLRL unit, Neva was past-president, vice-president, and secretary. Owners of a radio and TV store in San Diego, Neva and John were particularly active in AREC and c.d. activities. They will be missed by their many friends.

## How's DX?

(Continued from page 67)

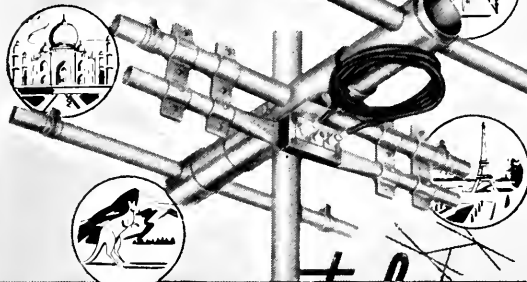
by Statesider W3ZXD . . . . W6ZOL could use a tip on ex-KS4AQ's present whereabouts . . . . A belated bow to W2GTU for the idea behind last month's Jeevesie cartoon . . . . In very few months the FG7XB ten-watter with two crystals made contact with over 200 stations in 33 ARRL DXCC List countries. There is *nothing* like a call! . . . . Club North American notes, WFGDXC: W6AIW, W6EIB and YN4CB have been straining at the leash to put YNØYN on the air from Corn Island. KS4 and HKØ operation is a possibility on this jaunt, too. Meanwhile, KS4AW hopes to keep Swan Island available for another month or so. NCDXC: VP7NX (W6RRG) subsequently may be heard as VP2NX, VP2RG and HJ6NX . . . . SCDXC outfitted itself with four nifty trophies to be awarded to high club scorers in the '55 ARRL DX Test, plus another rotating plaque award to be held by southern California's top all-around DX performer each year . . . . Sparked by the news-gathering of W4KVX, Ohio Valley Amateur Radio Association's *Ether Waves* burgeons into quite a juicy DX newsletter. . . . W9FGX does DX-editing chores for *Sparks*, organ of the Tri-State Amateur Radio Society with headquarters in Evansville, Indiana.

(Continued on page 152)



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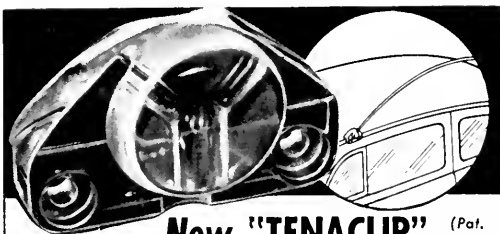
for application to tape transmission. Contact **John Keye**, 1700 W. Padre Drive, West Covina, Calif. or Barkelaw & Scantlebury, 530 W. Sixth St., Los Angeles 14, Calif.

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ARTICLE ...

### DXCC NOTES

Announcement is hereby made of the addition to the ARRL Postwar Countries List of two new countries. For purposes of identification these will appear on the list as Saint Martin and Sint Maarten. Saint Martin will encompass all French territory within the limits of 17 and 19 degrees north latitude and 62 and 64 degrees west longitude. Sint Maarten shall serve to designate Netherlands territory within these same boundaries.

DXCC credit will be given starting July 1, 1955, for creditable confirmations dated on or after November 15, 1945. This will permit foreign amateurs to start receiving credits at the same time as those in U. S. A. Confirmations received prior to July 1, 1955, for these countries will be returned without credit.

In future ARRL DX Competitions, those making contact with amateur stations located in either Saint Martin or Sint Maarten may claim credit for a separate country in accordance with DXCC rules.

### DX CENTURY CLUB AWARDS

#### HONOR ROLL

W1FH	258	W3BES	248	W3JTC	245
W6VFR	254	G2PL	247	W6SYG	245
W6AM	253	W3GHD	246	PY2CK	245
W6NXY	251	W6MEK	246	W2LAW	244
W8HGW	251	W6SN	246	W3KFL	244
W0YXO	250	W8NBK	246	W6MXN	244

#### Radiotelephone

PY2CK	238	W1MCW	215	W9RBI	210
W1FH	230	XE1AC	215	W3JNN	209
VQ4ERR	227	W1NWO	214	W9NDA	209
ZS6BW	223	W8HGW	214	SM5KP	207
W1JCX	215			W6DI	205

From February 15 to March 15, 1955, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

#### NEW MEMBERS

VP9G	155	W1LQQ	104	W5UUK	101
W0ANF	139	W6YRA	103	DL3NX	100
G3GFG	110	W2FCQ	102	DL3RM	100
W3MNG	106	OH9NV	102	G3IAD	100

#### Radiotelephone

W8RBI	122	W4IQG	110	W4JGO	100
1H8SB	116	W4DOV	102	W7HXC	100
W3ECR	116	ZD1SW	102	W0GEK	100
		W8QJR	101		

#### ENDORSEMENTS

W6DZZ	240	W4EPA	153	W1NLM	130
W6ADP	232	W9LL	153	W9MQK	130
ZS6BW	230	W3JNM	150	K2BZT	125
W6GFE	219	W9VIN	150	W8EV	125
W2TQC	200	W8DFQ	147	W5UX	120
W8UAS	200	W9RA	141	ZS5LA	113
PA0LB	170	OZ3Y	141	W9VP	111
ZL4GA	170	W6YK	140	W2WDP	110
W9BQE	168	DL1YQ	139	ZL4CK	110

#### Radiotelephone

CN8MM	184	G6AY	160	W1PST	130
G3HLS	180	VP9G	152	ZP5CF	130
W4DCR	160	W8BKP	141	W3JNM	129
W40M	160	W8TJS	132	W4BA	112
		11CQD	132		

#### W/VE/VO Call Area and Continental Leaders

W4BFD	241	VE2WW	181	VE8AW	160
W5MIS	243	VE3QD	210	VO6EP	190
W7AMX	240	VE4RO	223	4X4RE	210
W9NDA	243	VE5QZ	140	Z86BW	229
VE1HG	150	VE6GD	108	ZL2GX	235
		VE7HC	209		

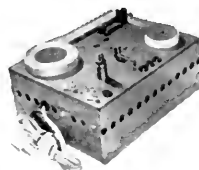
#### Radiotelephone

W2APU	202	W0AIW	179	VE4RO	120
W4HA	177	VE1CR	120	VE7ZM	140
W5BCF	205	VE2WW	102	OD5AB	154
W7HIA	181	VE3KF	163	ZL1HY	190

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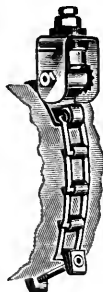
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(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature, and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale; by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply. To expedite handling of your copy please state whether you are member of ARRL.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred, but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

*Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.*

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**WANTED:** Cash or trade, fixed frequency receivers 28/42 Mc. W9YIV, Troy, Ill.

**WANTED:** Early wireless gear, hooks, magazines and catalogs. Send description and prices. W6GH, 1010 Monte Drive, Santa Barbara, Calif.

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**FREE Bargain Bulletin.** Visit store for thousands of unadvertised bargains. New BC610 tuning units TU-47, TU-48, TU-49, TU-50, TU-51, TU-52, \$5.95 each, Surplus RG-8/U cable, 100 ft., \$.55; 250 ft., \$13.25, 500 ft., \$25.00, Selsyns, 110 volt size 5, \$12.95 per 1000 Kc standard crystals, \$2.95. Wanted: Surplus radio equipment, Navy synchros. Lectronic Research Laboratories, 719 Arch St., Phila., Penna.

**RUBBER Stamp** with your call letters, name and address, \$1.50; stamp and thirty-five cent. El Jay Stamps, Box 5-WT, West Toledo Station, Toledo 12, Ohio.

**CALL SIGNS**—Three color, reflectorized (glass-beaded), aluminum, 4" x 12", \$1.50 postpaid, includes mounting frame for car, rig or shack. Lackner, W9WFT, 2029 Bradley, Chicago 18, Ill.

**MICHIGAN HAMS!** Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel. 8-8696, No. 8-8262.

**SUBSCRIPTIONS.** Radio publications. Latest Call Books, \$4.00. Mrs. Earl Mead, Huntley, Montana.

**SELL:** Vibrator power supplies, Model 2606 Hampack, 6VDC to 300VDC 100 Ma., \$14; Heavy duty 5.6VDC to 420VDC 280 Ma., \$25; 6VDC to 110VAC 50W, filtered, \$17; combination 6VDC or 110VAC to 300VDC 100 Ma. and 110VAC, filtered, \$22; 6VDC to 110VAC 100W maximum, filtered, \$30. All commercially manufactured, in excellent condition. Miscellaneous other supplies. BC946 broadcast receiver with 110VAC supply, \$25. F.o.b. St. Paul, Minn. W0BUO, Charlie Compton, 1011 Fairmont, St. Paul, Minn.

**UXH-10** wanted. Advise condition, coils and price. W1KJG, Box 295, Morrisville, Vt.

**QSL Cards?** Largest and finest variety. Samples 25¢ (refunded). "Rus" Sakkers, W8DED, P. O. Box 218, Holland, Mich.

**QSLs.** Something new—Different—All printed in 3 colors or more on glossy stock, \$3.85 per 100. Preference when ordering such humorous, plain or modern. Be surprised. Satisfaction guaranteed. 2-day service. Constantine Press, Bladensburg, Md.

**QSLs.** Samples dime. Printer, Corwith, Iowa.

**QSL-SWLS.** Meade W0KXL, 1507 Central Avenue, Kansas City, Kans.

**QSLs.** Neat, reasonable. Samples 10¢. Cyrus Jones, W3EHA, 840 Terrace North, Hagerstown, Md.

**QSLs:** 2-color, 150 for \$2.00. Samples 10¢. Bob Garra, Lehighton, Penna.

**QSL-SWLS.** Varicolored specials. Samples 10¢. Snyder, W9HIU, 113 Harrison, Jeffersonville, Ind.

**QSLs!** Modern design and craftsmanship. Samples 10¢. Tooker Press, Lakelhurst, N. J.

**QSL-SWLS.** Samples free. Backus Press, 5318 Walker Ave., Richmond, Va.

**QSL-SWLS.** Samples free. Bartnoski, W1YHD, Williamstone, N. J.

**QSL-SWLS.** Cartoons, Rainbow, others. Reasonable. Samples 10¢ (refunded). Joe Harms, 225 Maple Ave., North Plainfield, N. J.

**QSLs:** New, different. Samples 10¢. Graphic Crafts, Rt. 12, Ft. Wayne, Ind.

**QSLs** of distinction! Three colors and up, 10¢ brings you samples of distinction. Uncle Fred, Box 86, Lynn, Penna.

**QSL-SWLS.** High quality. Reasonable prices. Samples. Bob Teachout, W1F5F, 204 Adams St., Rutland, Vt.

**CANADIAN QSLs!** New designs, samples 10¢. Beynon, VE3WV, Collingwood, Ont., Canada.

**QSL-SWLS.** 100, \$2.85 and up. Samples 10¢. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

**QSLs.** SWLS. America's Finest!!! Samples 10¢. C. Fritz, 1213 Briar-gate, Joliet, Ill.

**DELUXE QSLs.** Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

**QSLs.** Samples free. Albertson, W4HUD, Box 322, High Point, N. C.

**QSLs!** Two colors, \$2.00 hundred. Samples for stamp. Rosedale Press, Box 164, Asher Station, Little Rock, Ark.

**QSLs "Brownie,"** W3CJL, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

**QSLs!** Taprint, Union, Mississippi.

**QSL-SWL** cards, Sensational offer, Bristol stock 500 1 color \$3.95, 2 color \$4.95, 3 color \$5.95. Super glossy \$1.25 extra. Rainbow cards. Samples 10¢. QSL Press, Box 71, Passaic, N. J.

**QSL** samples. Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

**QSLs.** Postcard brings samples. Fred Leyden, WINZJ, 454 Proctor Ave., Revere 51, Mass.

**QSL-SWLS,** as low as \$1.50 per color. Samples dime. Stronberg, P. O. Box 151, Highland Station, Springfield, Mass.

**QSL-SWLS,** Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

**QSLs.** Nice designs. Samples. Bescsparis, W3QCC, 207 S. Balliet St., Frackville, Pa.

**FINE quality QSLs,** 100, \$2.75. Oscar Craig, Newark, Arkansas.

**QSLs:** 10% discount to back-logging eagle havers. 15 samples, "Super-Speed Specials," 10¢. Robinson, W9AYH, 12811 Sacramento, Blue Island, Ill.

**QSLs,** Distinctively different. Postpaid. Samples free. Dauphinee, K6JCN, Box 66009, Mar Vista 66, Calif.

**DELUXE QSLs.** M. Vincek, W2INT, 117 Center St., Clifton, N. J. Samples dime.

**N. R. M.** Wholesale Radio, 286 Teaneck Rd., Ridgefield Park, New Jersey. HU 7-0715, for National, Gonset, B & W, Biley, Johnson, ICA, Eldico, Elmac, ARRL publications. Relays, Dow, Peterson xtals. Mail order also.

**HAMFEST!** Another Big Annual Affair for the Midwest hams, their families and friends. The Starved Rock Radio Club Hamfest, June 5, 1955. For details, see Hamfest Calendar or write W0MKS, Utica, Illinois.

**XYL** offered, the VS baby mobile antenna is beautifully chromed, only 4 ft. high. High Q, weatherproof plug-in miniature loading coils permit instant band changes. Top section resonates antenna to operating frequency. Becomes regular car whip when coil is removed. Perfect for 50-watt bandswitching transmitters. It's tiny but effective on all bands! Replaces regular coiled or fender bracket whip. Easily installed in a few minutes. Coils available 75 thru 10 meters. With all mounting hardware and one coil, \$12.95 ea. Specify band. Other coils, \$2.75 ea. W6VS, Bill Davis, 225 Cambridge Ave., Berkeley 8, Calif.

**2-METER** aluminum Brownie beams, \$22 and up. Write to H. W. Snyder, W3LMC, 4330 Glenmore Ave., Baltimore 6, Md.

**600 Watt Deluxe** transmitter, all band with HT-18 VFO microphone DE-TV1D. Many extras. Write to VE3AUJ, 511 Peel St., Woodstock, Ont., Can.

**NEW BD77 dynamotor:** \$17.50. Trade for a 2-meter converter. Cliff Moir, Rte. 4, Bath, Me.

**WANTED:** All types aircraft & ground transmitters, receivers, ART-13, RT18/ARCL, R5/ARNT, BC610E, BC221 motors and parts wanted. Fairest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

**CENTRAL ELECTRONICS** 10A \$99.95; Collins 32V1 \$399.95, 32V-2 \$495.00, 32V-3 \$599.00; Deltronic C1-134 \$99.95; Eldico MR-2 \$19.95, MD-40P \$39.95, TR-75TV \$39.95, A-300 \$19.95; Eico 145 \$15.00, 221 \$25.95, 315 \$39.95, 320 \$15.00, 360 \$49.95, 425 \$44.95, 950-B \$19.95; Hallicrafters S-38 \$34.95, S-40 \$69.95, S-41C \$24.95, S-X-42 \$69.95, S-X-43 \$129.95, S-X-62 \$260.00, S-71 \$159.95, S-72 \$49.95, HT-17 \$39.95, HT-18 \$69.95; Letting 240 \$59.95; Meck T-60-1 \$59.95, T-60-2 \$69.95; National HF \$99.95, HRO-M \$99.95, NC-46 \$64.95, NC-57 \$69.95, NC-98 \$119.95, NC-100X \$75.00, NC-200 \$79.95, SOJ-3 \$17.95, SW-54 \$34.95; other used items available; free list from CARL, WBFT, Evans Radio, Concord, N. H.

**WANTED:** Your amateur or surplus transmitters, receivers, test equipment, especially ART-13, ARN-7, APR-4, BC-610, Teletype, 75A, 32V, ARC-1, TDQ, DY-12, BC-348, BC-342, BC-221, TS-173, etc. Cash, or trade for NEW Johnson Viking, Ranger, Hallicrafters, Hammarlund, Barker and Williamson, Elmac, Central Electronics, Morrow, Gonset, Telrex, Fisher, Pentron, Bell, National, Astatic, Vibroplex, Harvey-Wells, Write Altronics, Box 19, Boston 1, Mass. Richmond 2-0048. (Stores: 44 Canal St., Boston, 60 Spring St., Newport, Rhode Island.)

**FOR Sale:** Meissner signal shifter. Late turret type. Used only a few hours building and testing a KW final. Looks new, \$50.00. W7CPY, 837 Park Hill Drive, Billings, Montana.

**FOR Sale:** Complete station. Collins 30K1 transmitter, 375 phone 500 w-cw, 310E exciter, bandswitching 80 through 10; Astatic D104 mike, 18-18D rect. relays, spare parts, guaranteed. \$249.00. \$995 takes all. Not sold separately. W5HEJ, F.o.b. West Monroe, La. 205 Circle Drive.

**FOR Sale:** Meissner 150-B transmitter, 250 w. 813 final 1.5 to 12.5 Mc. converted to cover 10 m. and 20 m. bands. TVI filtered. Single switch on front panel, changes to 250 w. ssb final. Hear it on 75 mornings or week-ends. Price \$250 with mike, key and spare parts. J. Taylor, W2OZH, Mt. Kisco, N. Y.

**COLLINS exciter 310-B1 coils and book:** \$200. H. Johnson, WIBGB, 25 Taylor St., East Longmeadow, Mass.

**WANTED:** Bandspeed coils for HRO Sr. (or HRO5 or 7). Will pay cash or swap. Have for sale or for swap 1104 mike with risk paid. 24na transmitter with all coils. Heath antenna tuner. Advance Elec. Relay 110v. co-ax relay. Frank V. C. Yates, K2DZS, 58 Wayside Lane, Trenton, N. J.

**FOR Sale:** Bassett Chamberlain cabinet trans. 200 W. out—c.w. fone; complete, in gud condx, with coils 10 to 80 m.; xtal controlled and instruction book: \$125.00. Wm. Storrs, 133 Fifth St., So. Plainfield, N. J. W2MMS.

**BC-312, converted, speaker, hopped up 2nd det., worked 130 countries:** \$48.00. K2GNC, William Pfaff, R.F.D. 5, Huntington, L. I., N. Y.

**SELL:** Electro-Voice 210-S, SB carbon mike, \$16; LW-61, 2 mtr. converter, \$15. KN21JT, Leone, 200 Park Ave., Medina, N. Y.

**COLLINS 32V-3, in excellent condx and in original shipping cartons:** \$500. J. L. Hollis, W3WTV, 9401 Saybrook Ave., Silver Spring, Md.

**SELL:** New, material cost only, cash carry! 2 element 20-meter Midway beam, \$22; pwr. tube, 1M power line carrier receivers, 25 watt xmitters, all for \$100. J. P. Neil, 1567 College Ave., Palo Alto, Calif.

**REAL Bargains!** New and reconditioned Collins, National, Hallicrafters, Hammarlund, Johnson, Elmac, Barker & Williamson, Gonset, Morrow, Babcock, RME, Harvey-Wells, Millen, Meissner, Lyisco, Sonar, Central Electronics—all others. Reconditioned \$400, \$609.00, \$408, \$79.00, \$76, \$129.00, \$X71, \$150.00, \$C 57, \$59.00, \$C 98, \$79.99, \$C 125, \$129.00, 1HRO60, \$189.00, 1H1, \$129. \$169.00, SP400X, \$259.00, 32V1, \$345.00, 32V2, \$445.00, 75A2, 75A3, Viking I, Viking II, Viking Ranger, HT9, NC18D, many others cheap. Shipped on approval. Easy terms. Satisfaction guaranteed. Write for free list. Henry Radio Stores, Butler, Mo.

**EMERGENCY power for Field Day. Surplus 1000 volt @ 350 mls and 14 volt @ 25 amp. DC generators with attached relay control box, an h.v. driven from car motor or with a 1 to 4 HP gasoline engine. Flexible coupling and spare brush kit included, only \$14.95 f.o.b. Elkhart, Ind. Shipping weight 100-lb. Easco Communications Co., 2611 Goshen Ave., Elkhart, Ind.**

**COLLINS 75A3 receiver, in perfect condition:** \$445. A. H. Hardwick, W2YQ, 391 Tremont Pl., Orange, N. J.

**FOR Sale:** 6 Eimac 250HT, \$15 each, 25 a pair; 5 Eimac 4-65-A, \$10 each; 2 RCA 810s, \$10 each, \$15 a pair; 5 2-24-G, 75c each, \$1.00 pair; Measurements Corp. pulse generator, Mod. 79-B, \$40; Bendix aircraft xmitter, TA-12-B, \$40; Bendix aircraft receiver, RA-10-B, \$25; all tubes, brand new, money-back guarantee. Selling out. Send for list. W4WV, Lemon, 206 Oakdale Rd. S.W., Roanoke, Va.

**VIKING II, \$225; Viking VFO, \$35; BC-779 SuperPro with power supply, \$75; Eldico Electronic keyer \$15; BC-221 Q, \$65; BC454 3-6 Mc. \$10; HF 10-20, \$45; plus many extras. Joseph Singer, W2RQJ, Hickory 6-0092.**

**FOR Sale:** 10 dynamotors 6 volt in 425 volts at 375 mls outp., \$19.00 each. Precision E400 sweep generator, \$50. Robert D. Mersey, W2TX1, 118 Franklin Ave., Lynbrook, N. Y.

**10 Meter mobile Motorola T-69-20 A w/ps, cables, \$40; Tri-Band, Gonset converter, \$25. Noise limiter, \$5. All in excellent condx. W2EGQ, Reed, 329 Cook Ave., Middlesex, N. J.**

**SELL 3-element 20-meter and 8 element 2-meter Hy-Lite beams. W2LFB, Azzara, 13 Shepard Pl., Nutley, N. J.**

**FOR Sale:** SLR 12-B Navy recvr, in gud condx (less spkr). Made by Scott Radio Lab. Best offer takes it. Zaval, K2AWN, 292 Riverside Ave., Brooklyn, N. Y.

**SELL:** Lettine 240, 349, K2EGW.

**FOR Sale:** PE103A brand new, in original sealed shipping crate, \$25. Also practically new, Morrow 5BK1 converter \$50. Gerald Drake, W9RVR, 1001 E. Coler, Urbana, Ill.

**FOR Sale:** HRO complete with C sideband slicer, in perfect condition, so guaranteed, first \$400. VFO-G09 in cabinet with own power supply, most stable made. Freq. coverage cw/am/ssb. A steal at \$100. W1CPI, 413 Ind. Bank Bldg., Providence, R. I., tel. DE 1-1317.

**BC-348L modified 110 volt, \$65, with speaker LS-3: \$85. SRC-522 complete \$50. K. Horton, 26 Sherwood Road, Stamford, Conn.**

**MODULATOR for 1 Kw final, pair of 811s, Class B; Thordarson multi-match transformer; metered relay rack panel; power supply for above, two 866As, time delay, metered, delay rack panel. Both in excellent condition: \$100.00. W2RVD, 464 Jericho Turnpike, Mineola, L. I., N. Y.**

**\$26 Worth of valuable radio parts for only \$6! Here are a few of the usable parts you'll find in this Army Surplus power supply unit: Ninety second time delay switch; 1 adj. pilot lamp socket assembly; 1 interlock switch, 125V AC, 12 amp; 1 filter cond. 1 ufd, 200 VDC; 1 filter choke, 2 1/2 H. 2000 VDC; 6 rectifier tubes, x836, 5000 V 25 ADC; 1 aluminum case, black crackle finish, 8 7/8 x 5 7/8 x 19 1/2; 2 tube sockets, P STD ceramic; 2 plate caps, ceramic fit #36, etc.; 2 terminal strips, 3 term. \$8 each; 2 for 10. Cash with order or C.O.D. Army Surplus Outlet, 91 N. Second St., Memphis 3, Tenn.**

**RECEIVERS:** transmitters, repaired and aligned by competent engineers, using the best instruments. Collins, Hammarlund, Hammarlund-National, Our nineteenth year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

**SELL:** Eldico TR75TV and Eldico 7100 w. modulator. Both \$75. Going to higher power. Freeman, K2GZE, 196 Rockaway Parkway, Brooklyn, N. Y. Tel. D1ckens 2-4219.

**BC-221C with power supply for sale.** Galbasin, W0MHN, 1801 Glen Moor, Denver 15, Col.

**HAMMARLUND HQ129X for sale.** Practically new and in perfect condition. Has the new HQ140X bandswitch dial (covers the 15 meter band): \$170. Instructograph (A.C.) with oscillator and ten tubes also for sale. Used very little and in excellent condition. \$30. Want 75A-1 or HRO 50. Dave Smith, K2C HS, The Choate School, Wallingford, Conn.

**FAMOUS 500W 813 rfp A-1 construction as shown in Jan. '54 (OST and ARRL Handbook at cost of parts: \$175.00. W4AZU, 1713 Blanton Lane, Louisville 16, Ky.**

**SELL:** Or trade for complete ham transmitter: Motorola taxi base transmitter (FMTU 50B) and receiver (FMRU 16B) in operating condx. Write WISAV, Box 23, Needham, Mass.

**ENGINEERING Degrees, E.E. major electronics, earned through home study:** American College of Engineering, Box 27724 (D), Hollywood 27, Calif.

**FIXED Station:** BC-459 modulated, complete with 400 volt 300 ml pwr supply; Hallicrafters Super Sky Rider recvr. Will sell both for \$150 or trade for mobile equipment. Sam E. Lack, W5DOE, Box 218, Oakdale, La.

**WANTED:** 2-meter transmitter, converter and pwr supply. Jim O'Connell, 4224 Bobolink, Skokie, Ill.

**COLLINS 32V-3 and 75A2A with factory installed mechanical filter; 8B1 xtal calibrator, 148C-INBFM adapter installed, both 3 Kc and 800 cycle filters included, plus speaker: \$1442 value: factory tested and like-new. Best cash offer. F.o.b. accepted. Write or wire (4 checked) Bowled, Jr. W0CVU, 1500 Center Point Road, N.E., Cedar Rapids, Iowa.**

**SALE:** Heathkit AR-2 communications receiver, factory aligned, cabinet practically new: \$25. Dr. Solomon, 41 Westbrook Lane, Roosevelt, L. I., N. Y.

**SELL:** Hallicrafters SX-25. First \$80 takes it; Gonset Mobile VFO, \$15. W9TRK, 0, Box 734, Carleton College, Northfield, Minn.

**TRADE:** new Crown antenna rotor and like-new Philco pocket Oscilloscope for clean Lettine 240 or Globe Scout. Must be in very gud condx. Bruce C. Vaughan, W5HTX, Springdale, Ark.

**SELL:** 60-watt phone transmitter; 807 final mod. with pair 616s, AB2, xtal osc. with 2 doubler stages; 40-meter xtal and coils for 10 meter output furnished, rf and audio on same chassis; \$30; power supply for above, transmitter, 600W, 300 Ma., 6-V, 6A, uses pair 866As; \$22.50. Both transmitter and power supply very nicely wired and used very little. Used 1200-0-1200V, 300 Ma., power transformer, \$12.50; new Astatic JT-30 mike, \$5.00; new Heathkit AO-1 audio oscillator, \$17.50; new Heathkit T-3 signal tracer, \$17.50; new Heathkit SG-8 signal generator, \$15.00. All neatly wired and in perfect condition. New Rod CPO-128A Codemaster, \$10. No trades. All answered. W5LFB, W. L. Cook, 1614 Morson Rd., Jackson 9, Miss.

**MEISSNER 150-B: VFO, 275w. phone, 80, 10 mtrs. Many extras. Used 200 hours: \$275; Hallicrafters SX-25, \$75; "Mark II" mobile transceiver, new, \$75. W3MCO, Trumper, 155 Summit, Bala-Cynwyd, Penna.**

**BARGAINS:** With new guarantee: R-9er, \$12.50; S-72, \$59.50; SW-54, \$35.00; S-38C, \$35.00; S-40B, \$79.00; Lyisco 600S, \$139.00; S-27, \$99.00; SX-43, \$129.00; S-76, \$149.00; SX-71, \$179.00; SR-75 \$99.00; S-25, \$49.50; SX-42, \$189.00; HRO-50, \$275.00; Heath AT-1, \$25.00; HT-17, \$12.50; Meck T60, \$49.00; Globe Trotter, \$49.50; Harvey-Wells DeLux, \$79.00; Viking I, \$209.50; Viking II, \$259.00; New SS-75, \$189.00; early HT-9, \$139.00; Globe King 400B, \$359.00; 32V1, \$95.00; 32V2, \$450.00; 32V3, \$550.00. Free trial. Terms financed by Leo, W0GFO, Write for catalog and World Radio Laboratories, 3415-27 West Broadway, Council Bluffs, Iowa.

**SELLING new, unused Telrex beams: 5-E-20-15 M; 6E-10M. Box 62, Brooklyn 12, N. Y.**

**FOR Sale:** 500W phone transmitter; Bud rack panel; 1P 100TH final; 100TH11 buffer; VFO, name brand components; extra tubes; Thordarson, RCA, UTC transformers in 5 power supplies; 10 and 20 meter coils. Priced to sell. W5MBP, Roberson, Jr., Box 293, Terrell, Texas.

**SELL:** PE-103, 807 mobile xmitter, mike, Motorola recvr, all cables. Need Meissner signal shifter. Gardner, 5333 Waterman St., St. Louis, Mo.

**FOR Sale:** NC-125 receiver with matching speaker, year old; maritime transmitter modified for broadcast use, meters, Command transmitters and receivers. W. Kathje, W0ESM, Grand Mound, Iowa.

**HEATH AC-1 antenna coupler, wired \$10. Johnston, W3TDZ-809 Hampshire, Drexel Hill, Penna.**

**FOR Sale:** Lettine 240 transmitter; Vibroplex Lightning Bug De-Luxe, W1UFZ, 3 Alder Lane, Burlington, Vt.

**SELLING:** Klensschmidt tape perlorator with case and rectifier: \$150; GO-9 transmitter, 3 to 18 Mc., built-in temperature compensated VFO; pi network output, 803 final; matching 500 w. power supply: \$125.00. Ernest Huftnagel, 11 Post Road, Pompton Plains, N. J.

**SELL:** Bud VFO-21 coils for 10, 20, 40, 80. Best offer over \$20.00. W0NYY, Orville Braaten, 406 E. 9th, Morris, Minn.

**SELL all or part; make offer:** two Biley 500 kc. xtal type BC; two Westinghouse meters 0-10 amps, R.F.; Navy L1 frequency meter with modulator, in gud condx, no book; BC453-B. A. Holzmiller, 423 McElroy Rd., Mansfield, Ohio.

**METERS:** Two 5 ampere, radio frequency ammeters, jewel make, \$8.50 each; one 0 to 500 DC milliammeter, jewel make \$7.50. All are used, but in A-1 condition. Nat G. Scott, Myrtle, Miss.

**FOR Sale:** Mobile rig, complete; Stancor xmitter, PE103, 2BR conv., mike, cables, whip, \$85.00. Alexander Amato, W8SKT, 5980 W. 130th, Cleveland 30, Ohio.

**LYSCO 600, excellent:** \$80.00, less shipping costs. W8OZL, Simmons, 338 W. Walnut, Ashland, Ohio.

**HALLICRAFTERS S-36, in exc. condx:** \$70.00; 2000 VCT 200 Ma. Chicago Transformer, \$10.00. Ben Logan, W8LUW, LeRoy, Ohio.

**WASHINGTON Area:** High power phone, c.w. rig: 3000V 65 Ma.; power supply; 4-250A final, completely protected with relays and special circuits. TVI suppressed. NC 173, HF 10-20, frequency standard, 6 ft. Vesto tower, rotor, synchros; big 20-meter beam, many other components. All priced for a quick sale. Cdr E. P. Bonner, USN, W4MXP, JE 3-7862, Falls Church, Va.

**BUILDING UHF** mitting station. Desire second hand equipment in good condition. Write to Alex Paleogios, 144-64 Sanford Ave., Flushing 55, L. I., N. Y.

**WANTED:** Heathkit Q meter, Millen grid dipper and 300 watt Multimatch modulation transformer. Larry Kleber, Belvidere, Ill. **FREE** List: Miscellaneous equipments, tubes, transformers, capacitors, etc.; Seidman, W2GZN, 1535 Longfellow Ave., Bronx, N. Y.

**SELL OR trade:** 1955 Automatic Rollei-flex Tessar f 3.5 lens; Rollei-flex BC flashgun, 35 mm. adaptor, 6 Rollei-flex filters, Rollei closeup lens, 28, 35, 110 and lens hood. Need: HRO-60 or 75A3. W5LAK, c/o Mrs. J. L. Garrett, Loganville, Ga.

**FOR SALE:** Teletype Model 26 and 12, Some 15 parts. Navy FRA teletype terminal, W6U11, 310 No. Rural Dr., Monterey Park, Calif. **SELL OR trade:** New unused Harvey-Wells VFO. Want G.D.O., 810's or what have you? W6SYA, Rosellini, 2619 So. Gaylord, Denver, Colo.

**FOR SALE:** NC-183D with speaker. Excellent condition: \$275. Will deliver within 40 miles. Harry E. Cudney, Jr., W2KNQ, R. D. Hewitt, N. J. Phone Upper Greenwood Lake 77-2192.

**WANT to buy** reasonably priced HQ129X; RM1-70, HQ120X or similar receiver. Sell: Jackson CRO-2, "color TV" oscilloscope, brand new condx: \$169. W0ZJH, Kirkman, 2444 Dee, Lincoln, Nebr. **SELL:** SX-71 with speaker, \$160; HT-18 VFO, \$60, gud condx. Henke, W9FCF, 1503 7th St., Wausau, Wis.

**SELL:** Collins PTO 70E-7, W6VS all-band mobile antenna, GR decade box, beam rotator, selsyns, teletype perforator. Long list for a 3e stamp. W9ERU, 2511 Burmont Rd., Rockford, Ill.

**SELL:** Millen grid dipper, \$40; BC-221, \$75; Heathkit audio generator, \$20; Dumort 5" oscilloscope, \$60; Conset Tri-band with motor revr, \$35; Motorola 10-meter xmitter with mike and all cables, \$40. All equipment in new condition. E. C. Zamber, 633 N. Penn, Indianapolis, Ind.

**ATTENTION VE Hams!** For sale: Telvar T-60 xmitter, 60 watts input; 80 meters through 10 meters, with 'phone and c.w. and in gud condx, no scratches: \$110.00 f.o.b. Kearney, Ont., Canada or best offer. No trades! John Somerville, VE3DJH, Kearney, Ont., Can.

**SALE:** All new condition with instructions: Conset Super \$38.00; McMurdo Style 701 xmitter 80 to 6, all coils: \$35.00; Waterman S11A industrial type (sl 842), \$70.00. H. I. Griffiths, 39-82 65 Place, Woodside 77, L. I., N. Y.

**SELL:** BC696, \$10; Command 160m VFO, \$10.00; BC458, \$4.00; 4-65A, \$10.00; Want: R9er, Electronic bug, W6IUB, Harmon, 5019 Gramar, Wichita, Kansas.

**FOR SALE:** Kilowatt xmitter: pr. 250TH final; 810s in modulator; 813 driver; VFO controlled-exciter; wonderful speech amplifier inc., sep. pwr supplies each stage; coils for 10-20-40; Variac, overload relays throughout; worked 80 foreigners one year with 47 confirmed; TVI suppressed, a complete rig for \$900, or best offer. 2000 volt at 100 mlla pwr supply. \$50.00; new new JAN 4-1000A xmtg tubes with fil. trans, \$75; pr. UTC smoothing and swing choke, 3KV 1 amp, new, \$30; new ARC-4 transceiver \$25; BC669 transceiver for 75 meters, \$35; Westinghouse dynamotor 410 volts @ 275 mills, \$12.50; BC306A ant. tuner, \$5.00; any reasonable offer considered. S. Ades, W3WQN, 9700 Marshall Ave., Silver Springs, Md.

**VERTICAL** antenna for 20-40-80M, all material and information included: \$59.50. No C.O.D. El Cajon Electronic Engineering, 720 So. Johnston Ave., El Cajon, Calif.

**SELL:** New BC-348P and LS-13 speaker and dynamotor, converted for 110 v. Guaranteed perfect: \$30.00. Archie Foster, Colton, N. Y.

**FOR SALE:** Telect cascde 2-meter converter. Output 14-18 Mc. In gud condx. Complete with tubes and xtal: \$25.00. Philip Mooney, W1NCZR, Waterbury, Vt.

**SALE:** Sonar 100w. phone 120w C.W., all-band, newest model, factory-wired transmitter and power supply with VFO and filter. Best offer over \$175. Sonar 3-band mobile receiver 20, 10 and 75, complete with filtered Mallory Vibrapack, new condx, \$60.00; National NC-125 receiver with speaker, \$125.00, new condx. Herb Holberg, W2FCI, 125 Hobart Ave., Rutherford, N. J. Tel. Webster 9-1101.

**FOR SALE:** New Viking Ranger, HQ-129X, like-new, with matching speaker: \$350.00 for both f.o.b. Lexington, Ky. Will accept Leica 111F or late model Rollei-flex in trade. W4JFB, Conleton, 1244 E. Cooper Drive, Lexington, Ky.

**SELL:** TB850C Bandmaster Sr.: \$50.00; Morrow 2B converter, \$25.00; Conset 10-11, \$12.00; Knight factory-wired VTMV, \$16.00; BC1206, \$5.00; Stancor 120 watt A2908 Mod. xfrmr, \$10.00; 2 Thordarson 700 mill T15C56 chokes, \$7.00 each; converter 6V dc in-110 v, 60 cycle, 25 KVA outp., \$7.00; 3 dynamotors, 6V dc inp. 250 V 60 mls outp. 6 V dc inp. 250 V 140 mls outp. and 12V dc inp. 680 V 210 mls outp. Make an offer. W9GBS, Schlachte, 6020 N. Neva, Chicago 31, Ill.

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**FOR SALE:** SX-16 newly aligned and tubed, excellent condx: \$55.00; matching hi-gain Browning pre-selector (c/o 39 Mcs. \$15.00). Both units, \$68.00. Gordon I KW antenna switching relay, new, \$7.00; PE-94, \$1.50; 3 1/4" DB meter, new, \$4.00; Mallory Vibrapack 12v. input 300v. @ 100 Ma. output, \$8.00; Weston Laboratory a.f. output voltmeter, Mod. 687, new, \$20.00. First check buys. \$12. shipped postpaid except revr and PE-94. Spencer Tucker, W2HJL, 51-10 Little Neck Parkway, Little Neck 62, L. I., N. Y.

**FOR SALE:** 600 watt conservatively rated xmitter in Bud deluxe 66" cabinet, using 4-250 A final into antenna tuner, Class B modulated by pair of 8300's. 1000 w. pwr. sup. for final and 1000 w. pwr. sup. pressed with Collins 310B1 as remote driver unit. Will sell amplifier modulator unit without Collins 310B1. Can be converted to high power line for SSB. Any reasonable offer will not be refused. Sil Thompson, W5BUF, 6460 Vicksburg St., New Orleans, La.

**FOR SALE:** Viking Ranger, \$175.00; TBS-50C with power supply, \$65; P.P. 813 final 10-20-75 meter coils. Cost \$175 to build as per 1952 Handbook. Sacrifice for only \$85.00. Sonar low pass filter LP-7, \$9.00. Frank Harrington, W1ERX, 34 Emerson St., East Norwalk, Conn.

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**SELL:** 32V1 and 75A2, both in excell. condx: \$325.00 each. Saltus, K6AVF, 9251 Carthay Circle, Spring Valley, Calif.

**SELL:** RT-19/ARC-4 complete unit, \$30. John McLaughlin, 405 S. Hartwell Ave., Waukesha, Wis.

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**VIKING** II and VFO, in perfect condx: \$250. Marcel Valois, W5FCV, Box 488, Covington, La.

**FOR SALE:** Viking II with VFO: \$260. Used less than 25 hours. G. E. Driscoll, W9RHE, 6920 N. Medford, Chicago, Ill.

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FOR Sale: Lyisco 600 \$100, Harvey-Wells TBS-50D, \$85; VFX-680, \$20; SOJ-1, \$15. All in gud condx; Carter Genemotor 6v in., 400VDC, 375 Ma. outp., new, \$30. All F.o.b. Louisville, Misc. small parts. List for self-addressed, stamped envelope. W4VDN, Art Crain, Jr., 105 Seminole Crt. Louisville 8, Ky.

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SONAR 2-meter rcvr, \$30.00; Sylvan crystal-control 2-meter converter, \$25; Navy model HRO rcvr, 5 sets coils, with power supply in rack mounting, \$50; McElroy tape puller and four 1600 ft. reels of code tape, Can be used on 15 and 20 by installing proper coils. Also extra tubes. Cheap! D. W. Keefe, W2MFS, 37 Highridge Road, Hartsdale, N. Y.

SELL: 500-watt deluxe SSB transmitter in cabinet rack. Five illuminated meters behind glass panel. Lattice exciter, voice control, VFO, pi-network final, by-passed for TVI suppression. Details on request. \$350, crated. Also walnut operating desk, p. 495, 1952 Handbook, \$35. W4HAV, J. A. Fulmer, 55 Vernon Lane, Ft. Thomas, Ky.

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## Test your QRK\*

THIS little quiz is based on articles appearing in *QST* for March. How much do you remember from the issue of two months ago?

1. What is the least noisy vacuum tube amplifier?
2. What benefit is gained by "fanning" elements of a beam antenna?
3. Multivibrators are usually used to divide the frequency of a crystal oscillator by a factor of not more than \_\_\_\_\_.
4. What adjustments at the transmitter will affect the s.w.r. in the transmission line?
5. What bill of interest to amateurs is pending in Congress?

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ANSWERS: 1. The triode (Low-Noise Receiver Design, page 20) 2. Increased broadband characteristics (A Compact Dual Beam for 20 and 40 Meters, page 11) 3. Ten (Frequency Marker with 50 kc Intervals, page 14) 4. None (Meet the S.W.R. Bridge, page 30) 5. S. J. Res. 25, pertaining to Amateur Radio Week (Happenings of the Month, page 47)

\* **QRK — QST Reading Knowledge.**  
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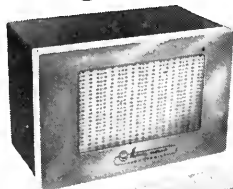
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**ultra-modern facilities to serve you best**

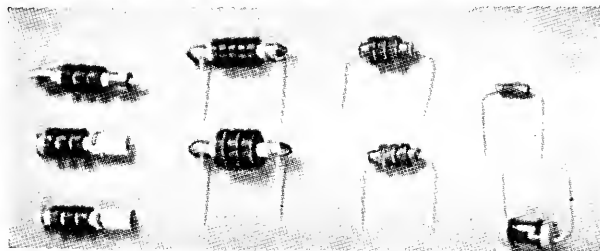
*you can't log 'em  
if you can't hear 'em!*

No matter what else a receiver does, it must pull 'em in! And that's just what the NC-183D does! Compare its **1uv** sensitivity (on 6 meters) and extremely low noise level with the highest-priced amateur receivers made (\$150 higher!) and you'll see why you'll hear more, log more on an NC-183D!

**COVERAGE:** Continuous from 540 kcs. to 31 mcs. plus 48 to 56 mcs. for 6-meter reception.

**FEATURES:** Two tuned R.F. stages. 3 stages of I.F. Voltage regulated osc. and BFO. Main tuning dial covers range in five bands. Bandsread dial calibrated for amateur 80, 40, 20, 15, 11-10 and 6-meter bands. Bandsread usable over entire range. Six-position crystal filter. New-type noise limiter. High fidelity push-pull audio. Accessory socket for NFM adaptor or other unit, such as crystal calibrator.

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In the Heathkit DX-100, a single RCA-5763 beam power tube drives two RCA-6146 beam power types in parallel in the final—an ideal combination that is capable of delivering a "healthy" signal at a very modest cost.

Here's ONE basic reason—among many—why amateur and professional designers prefer RCA Tubes.

RCA High-Perveance tubes deliver high power output—at lower plate voltages. For you this means: (1) lower-voltage filter capacitors, (2) lower-voltage tank circuits, (3) more reasonable values of pi-network components, (4) fewer problems with rf and dc insulation.

RCA high-perveance power tubes—both beam and triode types—are available at your RCA Tube Distributor. For technical data, write RCA, Commercial Engineering, Section, E37M Harrison, N. J.

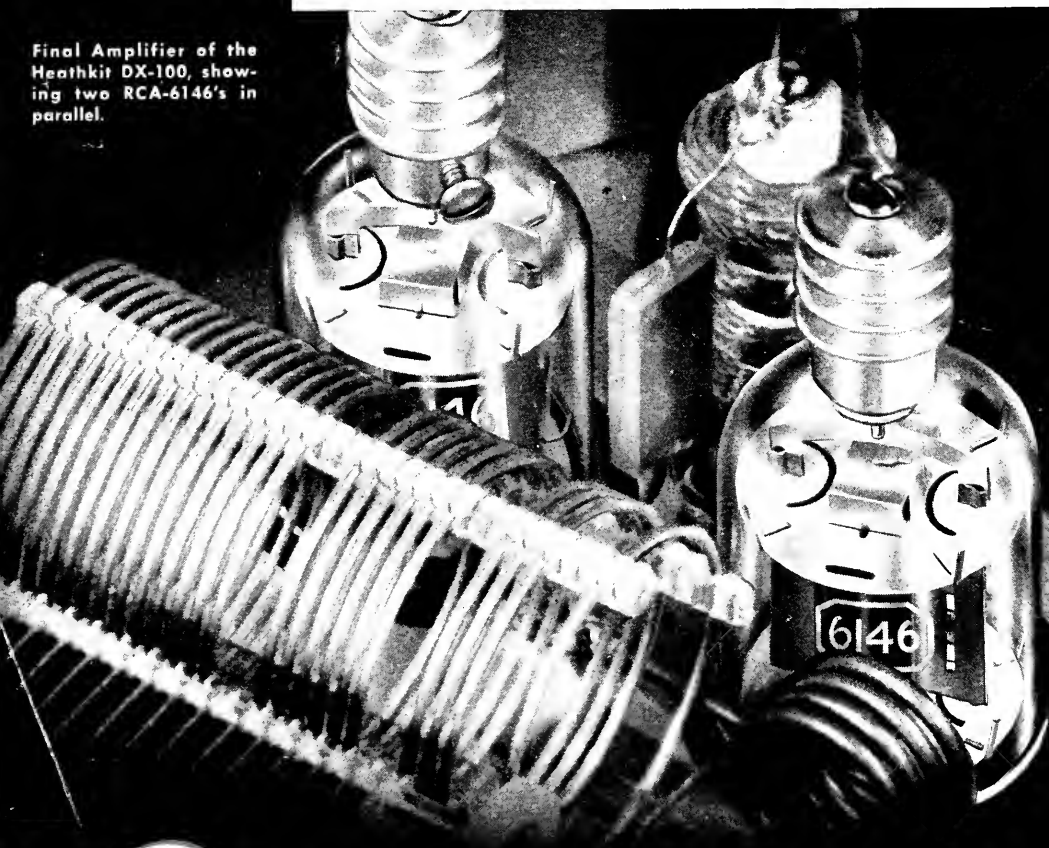


## NEW EDITION! RCA Headliners for Hams

Completely revised, up-to-date data on RCA Tubes for amateur transmitter applications. Free—from your Tube Distributor.

Popular beam power combination for medium power. RCA-5763 takes up to 17 watts input CW, 15 watts 'phone; RCA-6146 takes up to 90 watts input CW, 67.5 watts 'phone. Both types are original RCA designs!

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July 1955

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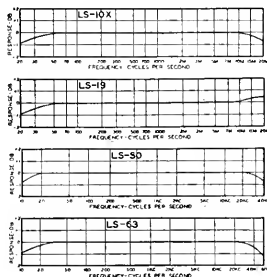
## TYPICAL UNITS

### LINEAR STANDARD series

Linear Standard units represent the acme from the standpoint of uniform frequency response, low wave form distortion, thorough shielding and dependability. LS units have a guaranteed response within 1db. from 20 to 20,000 cycles.

Hum balanced coil structures and multiple alloy shielding, where required, provide extremely low inductive pickup.

These are the finest high fidelity transformers in the world. 85 stock types from miliwatts to kilowatts.

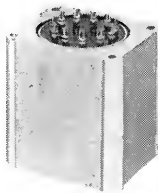


**LS-10X Shielded Input**  
Multiple line (50, 200, 250, 500/600, etc.) to 50,000 ohms... multiple shielded.

**LS-19 Plate to Two Grids**  
Primary 15,000 ohms.  
Secondary 95,000 ohms C.T.

**LS-50 Plate to Line**  
15,000 ohms to multiple line... +15 db. level.

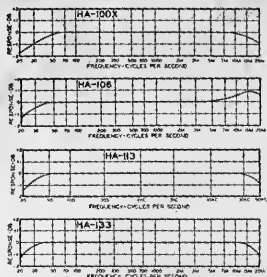
**LS-63 P.P. Plates to Voice Coil**  
Primary 10,000 C.T. and 6,000 C.T. suited to Williamson, MLF, ul-linear circuits.  
Secondary 1.2, 2.5, 5, 7.5, 10, 15, 20, 30 ohms. 20 watts.



**CASE** LS-1 LS-2 LS-3  
Length 3 1/8" 4-7/16" 5-13/16"  
Width 2 5/8" 3 1/2" 5"  
Height 3 3/4" 4-3/16" 4-11/16"  
Unit Wt. 3 lbs. 7.5 lbs. 15 lbs.

### HIPERMALLOY series

This series provides virtually all the characteristics of the Linear Standard group in a more compact and lighter structure. The frequency response is within 1 db. from 30 to 20,000 cycles. Hipermalloy nickel iron cores and hum balanced core structures provide minimum distortion and low hum pickup. Input transformers, maximum level +10db. Circular terminal layout and top and bottom mounting.



**HA-100X Shielded Input**  
Multiple line to 60,000 ohm grid... tri-alloy shielding for low hum pickup.

**HA-106 Plate to Two Grids**  
15,000 ohms to 135,000 ohms in two sections... +12 db. level.

**HA-113 Plate to Line**  
15,000 ohms to multiple line... +12 db. level... 0 DC in primary.

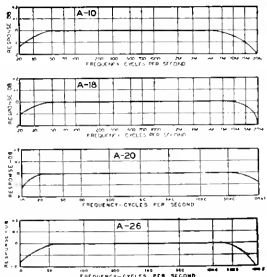
**HA-133 Plate (DC) to Line**  
15,000 ohms to multiple line... +15 db. level... 8 Ma. DC in primary.



**CASE** H-1 H-2  
Length 2 1/4" 3-9/16"  
Width 1 1/8" 1-13/16"  
Height 1 1/4" 1 1/2"  
Unit Weight 2 lbs. 5 lbs.

### ULTRA COMPACT series

UTC Ultra Compact audio units are small and light in weight, ideally suited to remote amplifier and similar compact equipment. The frequency response is within 2 db. from 30 to 20,000 cycles. Hum balanced coil structure plus high conductivity die cast case provides good inductive shielding. Maximum operating level is +7db. Top and bottom mounting as well as circular terminal layout are used in this series as well as the ones described above.

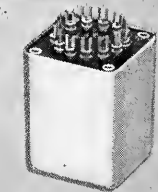


**A-10 Line to Grid**  
Multiple line to 50,000 ohm grid.

**A-18 Plate to Two Grids**  
15,000 ohms to 80,000 ohms, primary and secondary both split.

**A-20 Mixing Transformer**  
Multiple line to multiple line for mixing mikes, lines, etc.

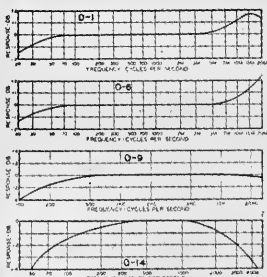
**A-26 P.P. Plates to Line**  
30,000 ohms plate to plate, to multiple line.



**A CASE**  
Length 1 1/2"  
Width 1 1/8"  
Height 2"  
Unit Weight 1/2 lb.

### OUNCER series

UTC Ouncer units are ideal for portable concealed service, and similar applications. These units are extremely compact... fully impregnated and sealed in a drawn housing. Most items provide frequency response within 1 db from 30 to 20,000 cycles. Maximum operating level 0 db. These units are also available in our stock P series which provide plug-in base. The O-16 is a new line to grid transformer using two heavy gauge hipermalloy shields for high hum shielding.



**O-1 Line to Grid**  
Primary 50, 200/250, 500/600 ohms to 50,000 ohm grid.

**O-6 Plate to Two Grids**  
15,000 ohms to 95,000 ohms C.T.

**O-9 Plate (DC) to Line**  
Primary 15,000 ohms, Secondary 50, 200/250, 500/600.

**O-14 50: 1 Line to Grid**  
Primary 200 ohms, Secondary .5 megohm. for mike or line to grid.



**OUNCER CASE**  
Diameter 7/8"  
Height 1-3/16"  
Unit Weight 1 oz.

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• Right: the "why" of G-E "Operation Snow White". Unretouched micro-photograph of tube grid, shows a strand of lint which can easily cause an inter-electrode short-circuit. Dust particles have similar effect.



• Glass-paneled hoods for General Electric 5-Star Tube assembly and microscope inspection, assure working conditions of optimum cleanliness. Employees wear rubber finger cots,

to avoid contaminating tube parts with dirt or moisture. The entire "Snow White" area is air-conditioned and pressurized, and all garments are made of lint-free Nylon and Dacron.

## G-E "Operation Snow White" further increases 5-Star Tube high reliability!

Inoperatives among 5-Star Tubes have been cut two-thirds by measures G.E. has taken to provide lint-free, dust-free assembly and inspection. 100% 5-Star factory tests prove this gain in *built-in* tube dependability.

Most tube inoperatives are the result of intermittent "shorts" from lint and dust. G-E "Operation Snow White", by means of pressurized, filtered, and de-humidified air, plus numerous other steps to accent working cleanliness, cuts down on short-circuits at the source. Result: 5-Star Tubes are the most trust-

worthy types that you can install!

Use them in civil-defense work, where dependable communications are a "must"! Specially designed, built, and tested, they're your foremost protection against rig and receiver failures.

Your G-E tube distributor stocks 5-Star high-reliability tubes. See him for full information! *Tube Department, General Electric Co., Schenectady 5, N. Y.*

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166-184

# SSB

**ease of operation  
exclusive with**

*Collins* **75A-4**



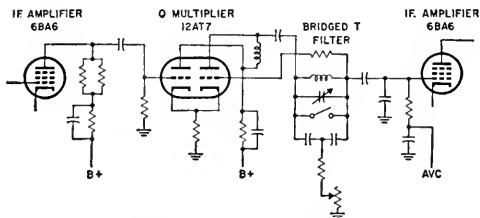
Advanced design features of Collins new 75A-4 receiver provide the greatest ease in SSB, AM, or CW operation ever offered to the amateur. Proven circuitry of the earlier 75A receivers such as crystal controlled first injection oscillator, hermetically sealed VFO and mechanically filtered IF selectivity are retained.

## PASSBAND TUNING

The receiver BFO is mechanically ganged and tracked with the main tuning dial. Once a SSSC signal is tuned in, it can be moved around in the passband to tune out interfering signals, and it also allows selection of either sideband for SSB operation. In CW reception the desired signal can be moved around in the passband without changing the received beat note, and at the same time, interfering signals can be pushed off the edge of the steep sided mechanically filtered passband.

## REJECTION TUNING

A combination "Q" multiplier and bridged-T rejection notch filter, are used. The filter has a deep, narrow notch and is effective anywhere in the passband. Conventional crystal filters become inoperative at frequencies several hundred cycles on either side of the resonant frequency. The "T" filter does not distort the IF passband seriously as does the crystal filter. Heterodynes are effectively eliminated with little loss of intelligibility.



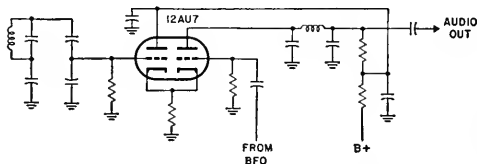
Rejection Tuning Circuits

## AVC

A fast attack, slow release AVC system is employed in the 75A-4. It will respond to the first few cycles of a sideband transmission and does not require the presence of a carrier for operation. Fast and slow release times are selectable by means of a panel mounted control. The fast is used normally for AM reception. The slow is used during sideband and CW reception and prevents the receiver from opening up during words and characters.

## SEPARATE AM AND SSB DETECTORS

Separate detectors are used for double or single sideband signals. The single sideband detector is a mixer type, which generates much less distortion than a conventional diode detector on a SSSC signal. A diode detector is used for conventional double sideband signals.



AM and SSB Detector Circuits

See your nearest  
Collins distributor





JULY 1955

VOLUME XXXIX • NUMBER 7

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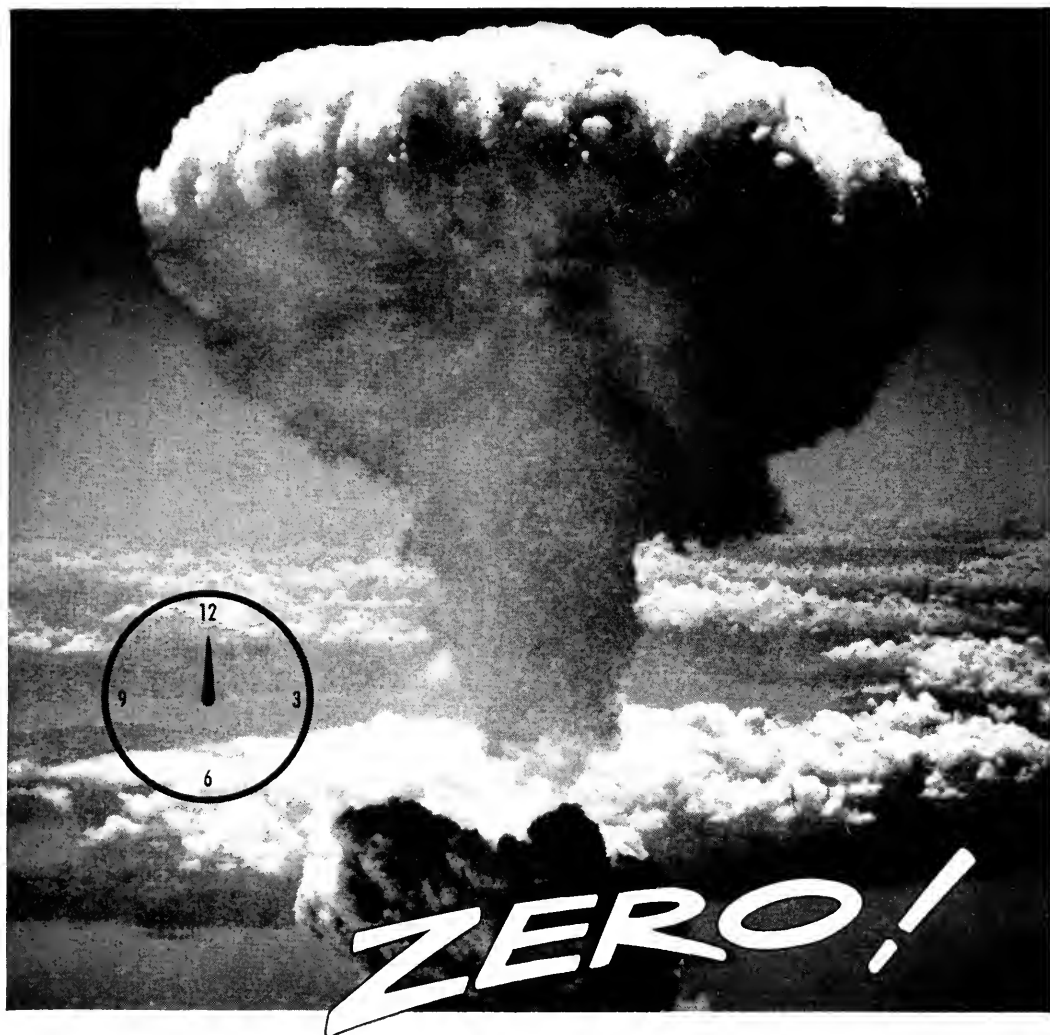
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**Reports Invited.** All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. *All amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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**More rugged**—Components surpass even the most rigid commercial specifications. Heavier transformers for less heat, and an exclusive Hallicrafters feature, a blower to further reduce heat!

**More reliable**—on-the-air factory tests assure you of dependable performance. Here in one compact package is a full band switch power amplifier covering 80-40-20-15-11 & 10 meters that's easy to drive, highly stable, extremely versatile, and engineered to Hallicrafters world-famous quality.

### SPECIFICATIONS

Plate Power Input—500 - 510 watts.

Power Output—330 P.E.P. on 80 meters with slightly less on 10 meters.

Drive Power for 80 meter input 10 watts P.E.P. maximum on lowest frequency.

### FEATURES

1. Continuous frequency coverage from 3.4 Mc. to 30 Mc.
2. Pi-network output for efficient harmonic and T.V.I. suppression.
3. Major T.V.I. suppression built in.
4. Does not require an antenna tuner as will feed loads from 50 to 600 ohms.
5. Full power capabilities available on CW because high stable, time proven circuitry does not require trick overload protective devices.
6. No special selection of R.F. amplifier tubes required.
7. Total tube replacement cost including high voltage rectifiers, amateur net only \$14.20.
8. Full metering of all important circuits.
9. Power input in watts shown on meter.
10. May be mounted in relay rack.

### CIRCUIT DETAILS

This power amplifier employs two 811-A zero bias triodes in parallel. The input system is designed to be fed from a 50-70 ohm unbalanced line and requires a maximum of 10 watts drive on 80 meters. The grid tank circuit is balanced to provide all band neutralization. The output tank circuit is a continuously variable pi-network which provides a high degree of harmonic suppression.

### TUBES

2—811-A Triode amplifiers

2—866-A Rectifiers

### POWER OUTPUT

P.E.P.—330 watts

CW—275 watts

### PLATE POWER INPUT

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CW—450—9 watts

### FRONT CONTROLS

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Grid Tuning

Meter—Plate/Grid/Power Input  
Watts

Plate Voltage On/Off

Power On/Off

PA Tuning

Antenna Loading—Fine

Antenna Loading—Coarse

### Physical details:

Grey black steel cabinet and brushed chrome control knobs. Piano hinge top. 10 $\frac{3}{4}$ " x 19" relay rack panel—over all size 20" wide x 12 $\frac{1}{4}$ " high x 17 $\frac{1}{4}$ " deep—shipping weight 100 lbs. approx.

### POWER

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**Engineered to performance, not to price!**

Model HT-31 Linear  
Power Amplifier \$395.00





# THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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# "It Seems to Us..."

## PUBLIC RELATIONS

The instances are fortunately rare, but every now and then an item in a newspaper will carry an account of amateur radio which can be classified as uncomplimentary. The subject is usually amateur interference. Occasionally the item is directly antagonistic; more often the disparagement is implied, or conveyed by an inaccurate headline.

In some of these few cases amateurs will write the League asking that a retraction be demanded. In our experience, this is entirely the wrong approach, for two reasons: Too much time is wasted (any effective action must be immediate); and generally speaking the editor is more impressed with a protest from his local readers than one from a distant organization. Usually, an alert local ham or club will take immediate action by contacting the paper or writing a letter to the editor in an attempt to obtain clarification and set the record straight. While this is the preferable procedure, it still has the disadvantage of again mentioning interference and amateurs in the same breath, and thus tends to accentuate the association of ideas.

There's a much better basic approach.

What is needed is full, complete and accurate accounts of all *other* amateur doings, so that any localized interference problems will seem minor in comparison to the good that can be and is being accomplished by public-spirited hams. In other words, a good long-range public relations program. To paraphrase the song title, you eliminate or neutralize the negative by accentuating the positive.

Naturally, any emergency activities of amateurs should be promptly and fully reported to the newspapers and radio stations. But in any one community emergencies are few and far between. You can't create a disaster, but you can be alert to participation in civic projects, or to initiation of some of your own, to maintain and improve the local standing of your amateur group. We'd like to mention here several such special projects, simply to suggest angles which you might use.

"Must" reading for those concerned with the state of our public relations is the article in November *QST*, describing Maryland Amateur Radio Week activities of the Baltimore Amateur Radio Club. It's full of project ideas.

A number of clubs have coöperated in fund-raising drives. One helped out in an all-night Telethon on behalf of the March of Dimes. Persons wishing to contribute called the TV station, whereupon an amateur net control installation directed a mobile to the address, where civic club members performed the leg-work of actually calling on the donors. Another amateur club undertook a similar project in a cerebral palsy drive, enriching it to the tune of \$50,000 — and doing themselves a world of good in public relations.

In a city famous for its huge parades, hams offered their services to the grand marshal. The marshal reluctantly accepted, and ended up immensely pleased — the parade started on schedule for the first time in the city's history! Needless to say, hams are now a fixture whenever they "strike up the band."

But you don't need to wait for fund drives or parades; except in the larger cities, a great many amateur occurrences are considered newsworthy. The local club receiving its charter of ARRL affiliation; a local amateur making DXCC; an emergency coördinator being appointed; participation by the club members in a contest, Field Day, or hamfest; delivery of a message from a serviceman in Alaska to his mother — all these and a host of other activities, however common they seem to us, can mean an inch or two in the Daily Bugle or 30 seconds on "The Voice of Podunk."

What else? Well, is your PTA putting on a hobby show? Be in it! Kiwanis looking for a speaker? Volunteer! Does your company have a "house organ"? Its editor would probably be delighted to have a feature story on the hams in the company.

Publicity helps are available at League Headquarters to make it easier for you, too. A sample speech, interview, radio broadcast program, and TVI script with slides are available. So are reprints of outstanding amateur stories, which have appeared in nationally-known magazines, to explain our hobby to interested BCLs.

Good public relations are important to nearly every society, corporation, or charity, but especially important to us — our very licenses depend on our activities being "in the public interest, convenience, or necessity." We must leave no doubt in the minds of the public that we meet this requirement.

## HAMFEST CALENDAR

**ILLINOIS** — The Central Illinois Radio Amateur Picnic will be held Sunday, July 17th, at Spider Woods State Park, six miles southeast of Decatur on State Route 121. Registration will open 11 A.M. CDT. There is no charge for admission to anyone interested in amateur radio. Lively contests for the kids; it will be a real family affair. There will be a ham auction and a swap table. Bring the family and a basket lunch. Drive east of Decatur on Highway U.S. 36 and watch for Ham Picnic signs.

**INDIANA** — The Annual Turkey Run V.H.F. Picnic will be held on Sunday, July 31st, at Turkey Run State Park under the sponsorship of the Wabash Valley Amateur Radio Association. The route in the park will be posted. There will be a swap table and games. Bring your family and a lunch basket and meet the v.h.f. gang. For further information write to Charles Hoffman, W9ZHL, Picnic Chairman, P. O. Box 186, North Terre Haute, Ind.

**MICHIGAN** — The annual Upper Peninsula Hamfest will be held on Sunday, July 31st, in the Houghton area, under the sponsorship of the Lake Superior Radio Club. The election of the UPEN NCS will take place at this time. Further details of the program will be given on local bulletins. There will be a potluck lunch, with coffee, pop, and ice cream provided by the host. A registration fee of one dollar will be collected at the grounds to cover expenses.

**MICHIGAN** — Sunday, July 31st, at Warren Dunes State Park, 15 miles south of St. Joseph, Michigan, on U. S. Hwy. 12 — Annual Picnic and Hamfest of the Blossomland Amateur Radio Association. Bring the family, a basket lunch, and swimming gear; also usable radio equipment for swap and shop. Ten-meter transmitter hunt. No admission charge to the park or picnic. Registration fee \$1.00 in advance or \$1.25 at the park. Please make reservation in advance through R. T. Hatch, W8JFW, 3225 Cleveland, St. Joseph, Michigan.

**MICHIGAN** — The first annual Adrian Amateur Radio Club Hamfest will be held Sunday, July 10th, at the Adrian, Mich., Fairgrounds. The program will consist of various contests of acquired skills, and will include activities of interest to XYs. The following bands will be monitored for mobiles: 2 meters at the low end; 10 meters at 29,640; 75 meters at 3910 and 3960; and 160 meters at both ends of the band. Gov. G. Mennen Williams of Michigan is expected to speak briefly. There will be a "swap and shop" party throughout the day. Representatives of leading manufacturers of electronic equipment of interest to amateurs will be present to discuss their products with the group.

**MONTANA** — The Glacier Waterton International Peace Park Hamfest will be held at Apgar Camp Grounds in Glacier Park on July 23rd and 24th. All welcome.

**WYOMING** — Saturday and Sunday, July 23rd-24th. The Annual Wyoming Hamfest at the South Fork Camp ground and Inn, in the beautiful Big Horn mountains 18 miles west of Buffalo, Wyoming. The Sheridan Radio Amateur League is sponsoring the event. A full program including banquet and Wyoming Trading Post is planned. Registrations, including banquet, \$3.50. Tourist mobiles in Yellowstone Park area welcome; watch for mobile antennas on Highway 16. Register with Robert B. Miller, President, 8RAL, 362 E. Loueks St., Sheridan, Wyoming, or contact any Wyoming ham for information.

### COMING A.R.R.L. CONVENTIONS

**July 30th-31st** — Canadian Division, St. John, New Brunswick  
**August 12th-14th** — Roanoke Division, Old Point, Va.  
**September 3rd-4th** — South Dakota State, Yankston, S. D.  
**October 15th-16th** — Central Division, South Bend, Ind.  
**October 22nd-23rd** — Midwest Division, Omaha, Neb.

## A.R.R.L. CANADIAN DIVISION CONVENTION

Saint John, N.B. — July 30th-31st

The New Brunswick Amateur Radio Association is sponsoring the 1955 ARRL Canadian Division Convention to be held in Saint John, N.B., on July 30th-31st, with the Loyalist City Amateur Radio Club as host. Every effort is being made to make this convention a most interesting, informative and enjoyable affair. It will be held in the YMCA building, commencing at 6 P.M. ADT, Saturday, July 30th. Registration is from 2 to 6 o'clock.

The program will include a banquet, special speakers, presentation of the VEI Contest cup, and contests. There will be a 75-meter hidden-transmitter hunt, picnic, games, etc., on Sunday, July 31st. Alternative plans are being arranged in case of poor weather on Sunday. There will be special programs for the ladies.

The rates, including banquet and picnic, are \$4.00 for men and \$3.00 for ladies. Send advance registrations to R. B. Nichols, VE1GE, 153 Rodney St., West Saint John, New Brunswick, Canada.



**25 Years Ago**  
this month

July 1930

... Describing the annual meeting of the ARRL Board of Directors, the Editor states that a lively advance interest was displayed by the members in regard to important topics scheduled for discussion. Comments were also made concerning various problems confronting 'phone men and measures the Board feels necessary to make voice operation more effective and enjoyable.

... Adventure and ham radio are combined in "Hamming with a Portable in Africa," by Clyde De Vinna, W6OJ-W6ZZK.

... "Naval Reserve Holds Its First National Emergency Drill," by William J. Lee, is a detailed report of that organization's latest operating activity. Main objectives of the drill were to determine speed, completeness of district representation, accuracy and circuit discipline.

... VE2CA, operated by Mr. and Mrs. Earle H. Turner, is the station of the month. With two transmitters, each employing UX-852 oscillators, the Turners emit healthy signals on both 7 and 14 Mc. Two receivers are in operation: one, a four-tube with an r.f. stage, detector, and two audio stages; the other, a conventional Hartley with a two-stage audio amplifier.

... RCA announces the production of three new tubes. One is a general-purpose tube known as the UX-230; another is a screen-grid tube, the UX-232; and the remaining is an UX-231 audio power amplifier featuring low distortion.

... Some good hints on key click elimination can be found in the Experimenters' Section of this month's issue. An excellent filter is described. It utilizes old Ford spark coil primaries and two 0.006-μf. capacitors.

... In the same section, A. E. Harrison, W6BMS, describes a receiver for 3.5 and 7 Mc. using a variometer for the tuning inductance. The set uses a Type '22 untuned r.f. stage, a Type '99 detector and two Type '01As as audio amplifiers.

### OUR COVER

"Oh! my aching back. . . I almost got that W7 . . . That #&%\* generator!" These are familiar post-Field Day expressions. Yes sir, if you weren't out with the gang this year you just haven't lived!

# A Four-Band S.S.B. VFO

*Single Fundamental Range for Use with Conversion-Type S.S.B. Exciters*

BY GORDON LAUDER,\* W9PVD

Most of the VFOs used in s.s.b. work with the Central Electronics exciters and others using a 9-Mc. master oscillator cover one, or at the most, two bands: 75 meters, or 75 and 20 meters. This is because the same 5-Mc. injection frequency can be used in the mixer stage for both these bands, but not for others. However, the injection frequencies for 40- and 160-meter operation are harmonically related to this same 5-Mc. injection frequency. The beautiful part of this is that the oscillator can always be calibrated against the 5-Mc. signal of WWV. Thus a VFO with a fundamental tuning range of 5.0 to 5.5 Mc., plus a bandswitched buffer/multiplier stage, will furnish outputs on all four bands.

Using two miniature tubes and slug-tuned coils, a complete unit can be built horizontally on a 3½-inch rack panel, as indicated by the accompanying photographs of the one used at W9PVD. The tuning is done with a National type MCN dial which has been equipped with a National type HRT knob for ease of tuning.

The circuit uses two 6AK6 tubes, one as an electron-coupled oscillator and the other as a buffer/multiplier stage. The plate coils of the buffer/multiplier stage are shorted out electrically, when not in use, by a Centralab switch that connects all unused contacts, thus connecting B-plus to both sides of unused coils. Shorting the coils allows mounting them in close proximity. All that is necessary is to wire B-plus voltage to any unused contact on the switch.

An 0B2 VR tube is used to stabilize plate and screen voltages of both tubes. Each stage uses 10 ma. of cathode current. The Central Electronics exciters furnish 300 volts at 25 ma. through the accessory socket in the rear. The

\*134 Marquette St., Park Forest, Ill.

• No doubt there would be more s.s.b. activity on 7 and 1.8 Mc. if it were not generally thought that a separate VFO is needed. Here's how to make one VFO unit serve for both the popular 4/14-Mc. combination and the above two bands as well.

0B2 dropping resistor is adjusted until a current of 23 ma. is drawn with the 6AK6s out of their sockets. This allows a margin of insurance against loss of ignition in the VR tube. At these current and voltage settings, sufficient VFO injection is developed to give stable operation on all four bands.

## Construction

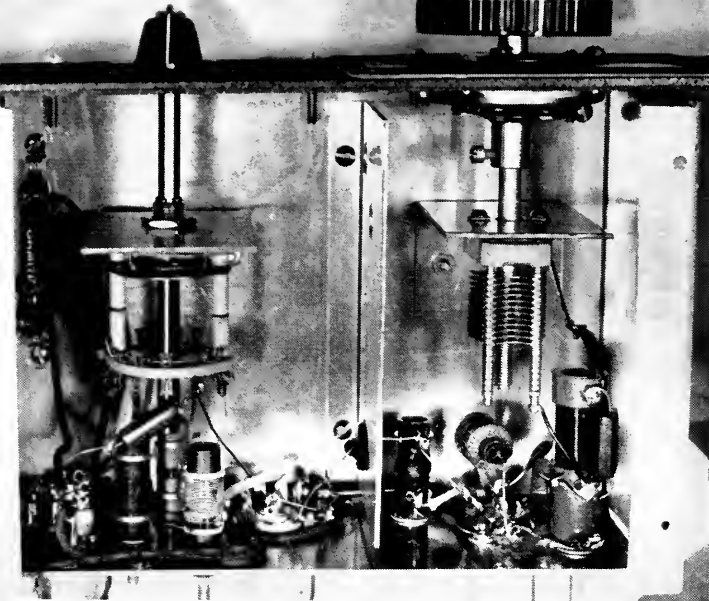
The author's VFO was built on a homemade chassis. Room was reserved on the left side of the panel for mounting a 2-inch 'scope monitor, as described in the 1954 ARRL *Handbook*.

The best size in commercially available chassis would be the 5 × 10 × 3-inch with bottom plate. The dimensions of the chassis at W9PVD are 5 × 7 × 3 inches. The chassis is mounted with the top down and even with the bottom of the panel, to allow clearance for the bottom of the National MCN dial mechanism. The dial is mounted with the top flush with the top of the panel. The tuning condenser, C<sub>1</sub>, is mounted on an aluminum bracket so as to line up with the dial drive.

The switch S<sub>1</sub> is mounted on another bracket with the end of the 2-inch shaft projecting through a 3/8-inch hole in the panel to allow mounting the knob. This switch is mounted to be

The four-band s.s.b. VFO fits readily on a 3½-inch relay rack panel. By choosing the proper fundamental tuning range and using appropriate harmonics, four bands can be covered with exciters using a 9-Mc. s.s.b. generating frequency.





Oscillator circuit is at the right in this view, frequency-multiplying coils and handswitch at the left. The two resistors alongside the switch add up to the 10,000 ohms specified in Fig. 1 for the dropping resistor to the VR tube.

symmetrically placed with respect to the operation switch of the 10-A exciter, which is mounted directly above the VFO in the rack.

Viewed from the rear, the components mounted from right to left on the center line are  $L_1$ ,  $V_1$ ,  $L_2$ , and the plate coils for  $V_2$ , these coils being mounted in a roughly triangular grouping to give minimum lead length to  $S_1$ .  $L_5$  should be positioned for the shortest leads as it is the highest-frequency coil. After these come  $V_3$  and the jack,  $J_1$ . A 6-prong Jones chassis-type male connector was used for  $J_1$  because it was available in the junk box. However, any male connector having 5 or more prongs will do the job.

The two stages are shielded to reduce the possibility of feed-back when the buffer/multiplier is operated at the oscillator frequency. The coupling capacitor,  $C_6$ , is mounted inside a  $\frac{1}{4}$ -inch rubber grommet, both for mechanical stability and insulation.

Only two of the coils,  $L_1$  and  $L_5$ , need to be wound by the constructor. The total number of turns for  $L_1$  was wound on the XR-50 coil form, then  $5\frac{1}{2}$  turns were backed off before cutting and soldering to the ground end. The enamel is carefully scraped off with a knife, and the tap is made by wrapping the bared wire around a small diameter nail and then twisting once to

(Continued on page 116)

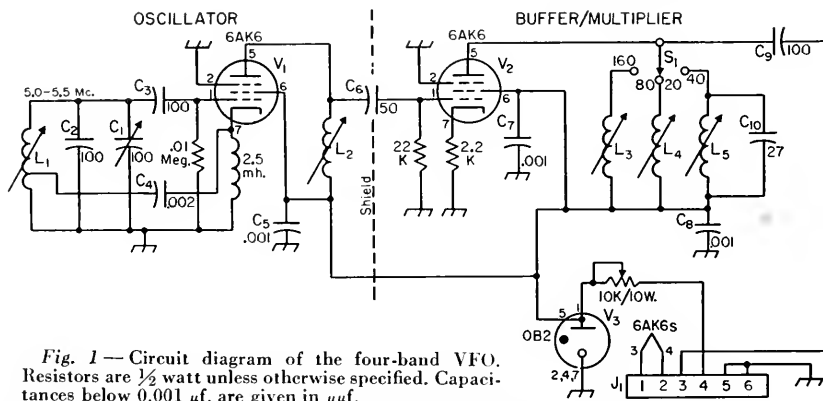


Fig. 1—Circuit diagram of the four-band VFO. Resistors are  $\frac{1}{2}$  watt unless otherwise specified. Capacitances below  $0.001 \mu\text{f}$ . are given in  $\mu\text{f}$ .

$C_1$  — 100- $\mu\text{f}$ . variable (Hammarlund HF-100 or equivalent).

$C_2$ ,  $C_3$  — Silver mica.

$C_4$  —  $C_8$ , inc. — Ceramic.

$C_9$  — Mica.

$C_{10}$  — Low-temp. ceramic.

$L_1$  — Approx. 8  $\mu\text{h}$ .; 37 turns No. 26 enam. on  $\frac{1}{2}$ -inch diam. slug-tuned form (National XR-50) tapped  $5\frac{1}{2}$  turns from ground end.

$L_2$ ,  $L_4$  — Slug-tuned (CTC LS-3 5-Mc. coil).

$L_3$  — Slug-tuned (CTC LS-3 10-Mc. coil).

$L_5$  — 25 turns No. 26 enam. on  $\frac{3}{8}$ -inch. diam. slug-tuned form (CTC LS-3).

NOTE: See text for data on resonating slug-tuned coils to proper frequencies. Inductance required depends on stray circuit capacitance and length of coax cable to s.s.b. exciter.

$S_1$  — Rotary switch, 1 pole, 3 positions, unused contacts shorted (Centralab PA-18 with PA-300 index. Use all spacers furnished to mount section near rear of index).

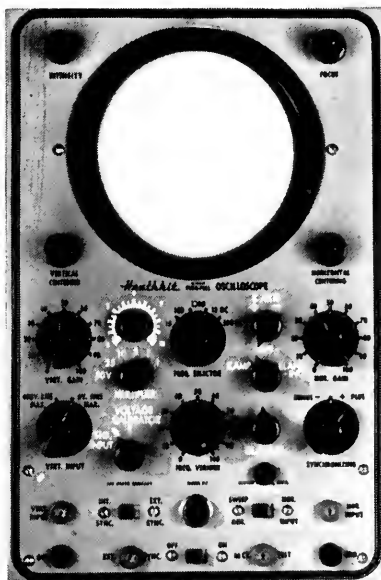
NOTE: The 2.5-mh. choke in the oscillator cathode circuit should be of the small type such as National R-33.

# Versatilize Your Oscilloscope

## Adding a Z-Axis Amplifier and Voltage Calibrator

BY LYLE E. SHARPE,\* W6FSC

THE addition of a Z-axis amplifier and voltage calibrator to any 'scope provides a useful asset and is not a difficult job. The oscilloscope pictured in this article is a Heathkit model 0-7, but the same technique may be applied to



Front-panel view of the 'scope with the additional controls.

\*% Engineering Dept., J. B. Rea Co., Santa Monica, Calif.

• This article describes the circuitry and construction involved in adding a Z-axis amplifier and voltage calibrator to any oscilloscope lacking these refinements. The Z-axis amplifier may be used for trace brightening, Z-axis modulation, or retrace blanking and, with the voltage calibrator, the measurement of any waveshape on the screen is available at the flick of a switch.

any 'scope, providing necessary space for mounting the parts can be found. In this case, very little space was available immediately behind the front panel, so two small subchassis were fabricated and set back on the main chassis with extension shafts run through panel bushings for the control knobs. As shown in the front-view photograph, the added rows of controls are placed midway between the existing controls with the voltage calibrator on the left side, and the Z-axis amplifier on the right.

### Voltage Calibrator

The voltage calibrator (Fig. 1) consists of a free-running symmetrical multivibrator ( $V_1$ ) operating at approximately 1500 c.p.s. Its output is taken off the plate of  $V_{1B}$  through  $C_1$  to the top of the diode load resistor,  $R_1$ .  $V_{2A}$  is connected as a clipper and functions as a clipper to square the waveshape. The plate of  $V_{2A}$  is direct-coupled to the grid of cathode follower,  $V_{2B}$ , and the output

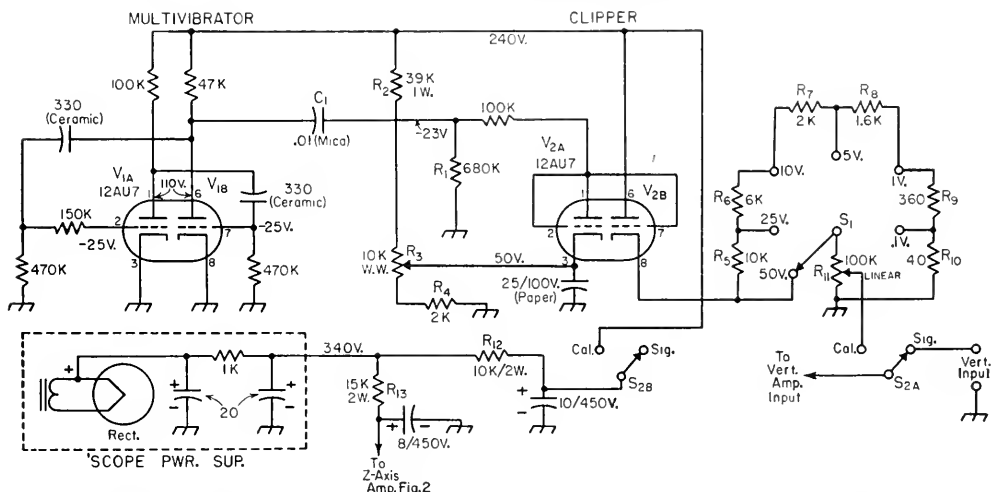
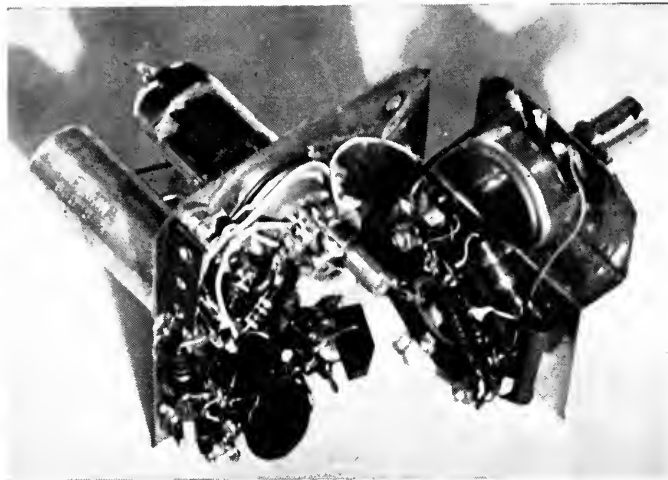


Fig. 1 — Circuit of the voltage calibrator. All resistors  $\frac{1}{2}$  watt, unless otherwise specified.

$R_{11}$  — Ohmite CU-1041.

$S_1, S_2$  — Rotary switch.



Voltage-calibrator sub-chassis wired and ready for installation.

voltage of the calibrator appears across the cathode-resistor string,  $R_5$  to  $R_{10}$ . The maximum peak-to-peak voltage in each position of  $S_1$ , as indicated, may be taken from the arm of the switch and attenuated through the gain-control potentiometer  $R_{11}$ .

Potentiometer  $R_3$  in the voltage divider,  $R_2R_3R_4$ , controls the bias on the cathode of  $V_{2A}$  which, in turn, controls the output voltage of the calibrator. Output voltage is taken from the arm of  $R_{11}$  to the calibrating position of  $S_{2A}$  for comparison with the signal being measured.

### Z-Axis Amplifier

The first tube in the Z-axis amplifier (Fig. 2) is a 12AU7 duo-triode acting as a phase inverter. The cathodes of both sections are tied together using the same cathode resistor,  $R_{14}$ . The second section operates as a grounded-grid amplifier. Signals from the plate of each section to the ends of the center-tapped potentiometer  $R_{15}$  are equal and 180 degrees out of the phase. This potentiometer must be linear, with 25,000 ohms

each side of center tap. The tube gives a gain of four for each phase.

The signal is then taken from the arm of the gain-and-phase-control potentiometer,  $R_{15}$ , through  $C_2$  to the input grid of  $V_4$ .  $V_4$  is a triode voltage amplifier with a gain of 12, thereby giving a total gain of 48 through the amplifier in either a positive or negative direction. From the plate of  $V_4$ , the signal is passed on to the top of  $R_{16}$  and through  $C_3$  to the grid of the cathode-ray tube. Positive signals at this point brighten the trace, while negative signals bias the tube toward cut-off.  $C_3$  must be a high-voltage capacitor to withstand the negative d.c. voltage on the grid of the tube.

### Blanking

The pulse for blanking is taken from the oscilloscope horizontal-sweep oscillator and differentiated through  $C_4$  and  $R_{17}$ . During the slow rise time of the sawtooth sweep, no voltage is developed but the rapid fall in voltage at the end of the sawtooth develops a pulse at the junction

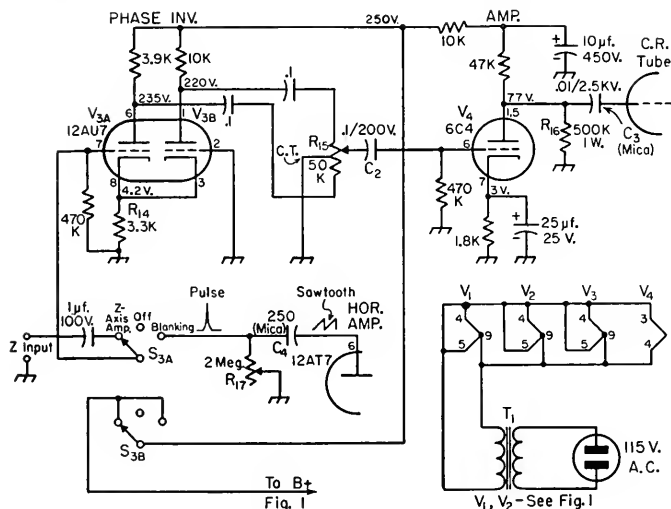


Fig. 2—Schematic of the Z-axis amplifier. All resistors  $\frac{1}{2}$  watt unless otherwise specified.

R<sub>15</sub> — Centralab BT-33.  
S<sub>3</sub> — Rotary switch.  
T<sub>1</sub> — 6.3 volts, 2 amp.



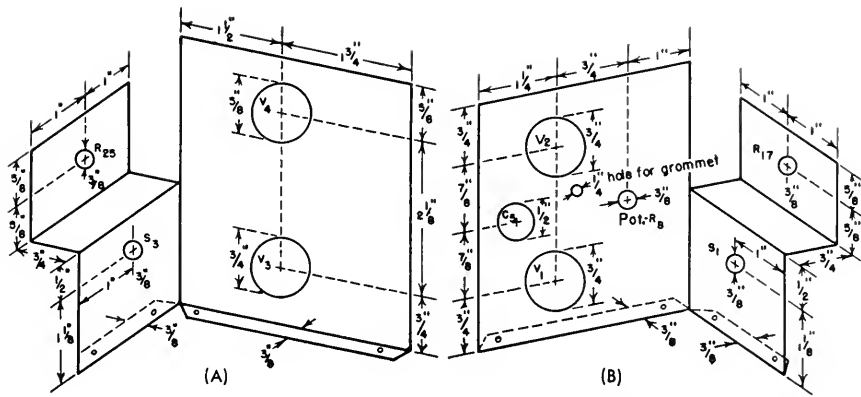


Fig. 3 — Sketch showing dimensions of the two subchassis. The one to the left is for the Z-axis amplifier; the one to the right is for the voltage calibrator.

of  $C_4$  and  $R_{17}$ , which is impressed on the grid of  $V_{3A}$  through  $S_{3A}$  when in its blanking position. The size and width of this pulse is adjusted by  $R_{17}$ , and  $R_{15}$  is adjusted toward its positive position, putting a positive pulse on the grid of  $V_4$  which, in turn, puts a negative pulse on the grid of the cathode-ray tube, thus biasing the grid to cut-off, and blanking during the retrace.

### Construction

The material used in the construction of the two subchassis is 0.026-inch copper sheet, since it is easily worked. They were cut out, drilled and bent to shape in a small vise, as shown in Figs. 3A and 3B.

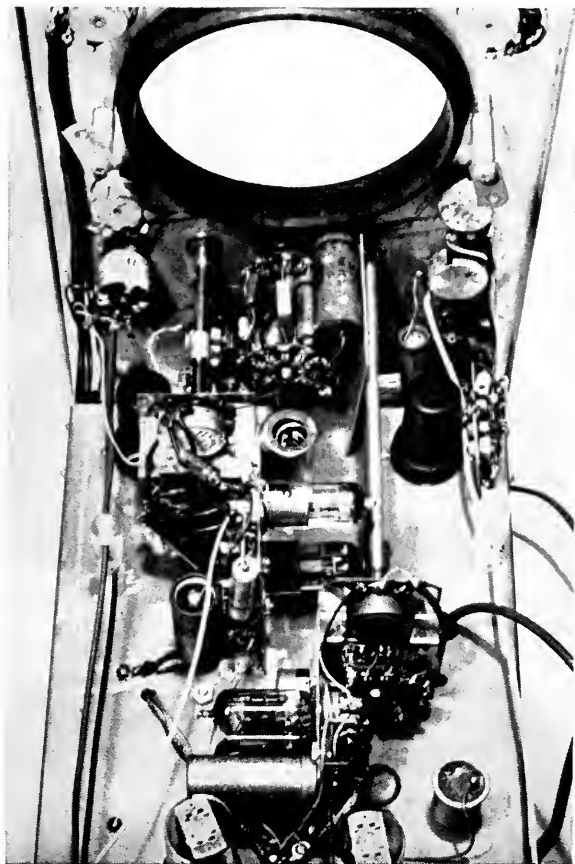
A photograph shows the voltage-calibrator chassis with the components mounted and wired. The calibration potentiometer,  $R_{11}$ , is shown mounted on the lip of the chassis, with the multiplier switch ( $S_1$ ) just below. The Z-axis amplifier chassis is bent in the opposite direction, with the gain-and-phase potentiometer,  $R_{15}$ , mounted on the lip, and the selector switch  $S_3$  below. These four controls are reached with extension shafts through panel bushings, the remaining controls being mounted on the front panel.

In the photograph of the voltage calibrator, the potentiometer shaft,  $R_3$ , may be seen extending through the chassis where it is available after assembly for adjustment of the voltage-calibrator output. The potentiometer is mounted between the tubes on the top side of the chassis, its leads being fed through a small grommet to the underside.

Both amplifiers should be completely wired according to the schematics, leaving signal, B+ and heater leads long enough to reach their connections. Wiring is not at all critical and point-to-point wiring was employed to conserve space.

The holes in the front for the added

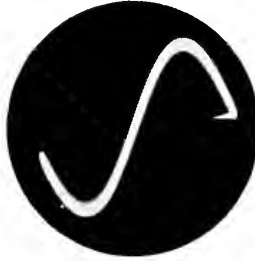
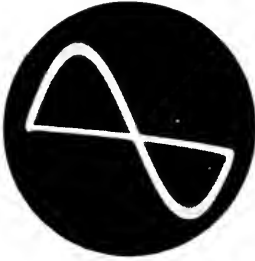
controls are all  $\frac{3}{8}$ -inch diameter. The hole for the shaft of the voltage-calibrator gain potentiometer,  $R_{11}$ , is centered  $2\frac{1}{4}$  inches above the main chassis, and midway between the oscilloscope vertical-gain and frequency-selector controls. The hole for the shaft of the multiplier switch,  $S_1$ , is  $1\frac{1}{8}$  inches below.



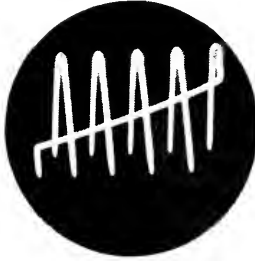
Rear view of oscilloscope with the cathode-ray tube removed, showing the added subassemblies. The voltage calibrator is in the foreground, and the Z-axis amplifier above and to the left.



« Fig. 4 — (Left) Voltage-calibrator square wave with low horizontal sweep frequency. (Right) Same signal with high-speed sweep.



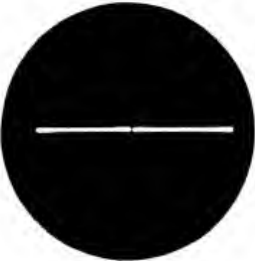
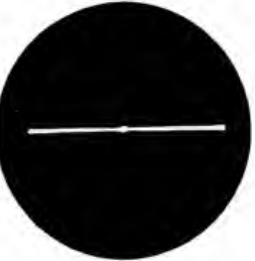
« Fig. 5 — (Left) Sine wave before return-trace blanking. (Right) Sine wave after return-trace blanking.



« Fig. 6 — (Left) Intensity modulation of 2-microsecond positive pulse. (Right) Z amplifier used for trace brightening.



« Fig. 7 — (Left) One cycle of sine-wave input to vertical modulator by 4 cycles of square wave (right).



« Fig. 8 — (Left) Marker-generator signal on baseline. (Right) Marker-generator signal putting a hole in baseline.

The voltage-calibrator switch,  $S_2$ , is mounted on the panel in the most available position between the oscilloscope vertical-input attenuator switch and the vernier frequency control.

The hole for the shaft of the Z-axis gain and phase control,  $R_{15}$ , is centered  $2\frac{3}{4}$  inches above the main chassis, and midway between the frequency-selector switch and the horizontal gain control. The hole for the shaft of the selector switch,  $S_3$ , is  $1\frac{1}{8}$  inches below. The blank-phase potentiometer,  $R_{17}$ , is mounted on the panel midway between the frequency-vernier and synchronizing controls. The Z-axis input jack is located just above the horizontal input switch.

The placement of the two subchassis, with their extension shafts through the panel bushings, is shown in the rear-view photo of the 'scope. The Z-axis amplifier chassis is on the left side of the photograph, just behind the 'scope horizontal-sweep-amplifier tube (6J5) and the voltage-calibrator chassis is on the right in front of the power-supply rectifier tubes.

The Z-axis amplifier draws only 8 ma. in operation, and the voltage-calibrator requires 10 ma., so they may be operated from the oscilloscope power supply, as shown in Fig. 1. The power-supply output voltage is 340. This potential is dropped to 240 volts through  $R_{12}$  for the voltage calibrator, and to 250 volts through  $R_{13}$  for the Z-axis amplifier. In the calibrate position,  $S_{2B}$  puts plate voltage on the calibrator, and  $S_{3B}$  has the same function for the Z-axis amplifier. It is necessary to provide another filament source for the tubes, so a small filament transformer,  $T_1$  in Fig. 3, is mounted alongside the power transformer, under the main chassis.

After the units were installed and the wiring completed, switch positions on the front panel were labeled with decals as shown. The voltage-calibrator multiplier switch shows maximum output voltages of 50, 25, 10, 5, 1 and 0.1. These voltages may be attenuated at each position with the gain potentiometer,  $R_{11}$ , which is calibrated in tenths on the front panel.

The only adjustment necessary after completion is to set the output level of the voltage calibrator. This calibration is in peak-to-peak volts which is equal to 2.88 r.m.s. voltage. Dividing the maximum output voltage of 50 by 2.88 is equal to 17.4 volts r.m.s. Turn on the oscilloscope, put  $S_1$  in the 50-volt position, and turn up the gain pot,  $R_{11}$ , to maximum output. A square wave should appear on the screen, as shown in Fig. 4 (left), if the horizontal sweep is at a slow rate. However, if the sweep speed is increased, an image such as Fig. 4 (right) will appear. Connect an a.c. voltmeter to Pin 8 of  $V_2$  and adjust potentiometer  $R_3$  so the r.m.s. output voltage reads 17.4 volts. The calibrator is now ready for operation.

Turn  $S_2$  to the signal position, and feed a sine wave into the 'scope input. Adjust the trace to any convenient height between selected lines on the screen mask. Turn  $S_2$  to the calibrate position and adjust the multiplier switch,  $S_1$ , and gain pot,

$R_{11}$ , till the square wave on the screen is at the same height between the previously selected lines. The sine-wave peak-to-peak voltage may now be read by noting the position of the multiplier switch and the percentage of the gain pot used. For example: If the multiplier switch reads 5 and the gain pot 7, there would be an indicated voltage of  $0.7 \times 5$ , or 3.5 volts peak-to-peak or, dividing by 2.88, 1.22 volts r.m.s.

Turn  $S_2$  to the signal position, put the sine wave back on the 'scope screen and turn up the intensity control so both the sine wave and retrace are visible as at 5 (left). Turn  $S_3$  to the blanking position, advance the Z-axis gain control,  $R_{13}$ , to its positive position, and advance the blanking-phase pot,  $R_{17}$ , until the retrace just disappears as at 5 (right). The small bit of retrace left on 5 (right) would be eliminated by increasing the gain of the blanking control. At low frequencies most of the resistance in  $R_{17}$  will be needed for blanking, but this becomes successively less as the frequency (speed) is increased.

### Z-Axis Amplifier

Set the Z-axis pot,  $R_{15}$ , to zero (midposition). Turn  $S_3$  to the Z-amplifier position. Take the sine-wave injection out of the vertical input and put a sine-wave signal of approximately 1 volt, 1000 c.p.s. into the Z-axis input jack. Set the 'scope horizontal sweep at approximately 100 c.p.s., and advance the Z-axis gain control toward either positive or negative polarity, readjusting the sweep rate at the same time until the baseline becomes a series of dashes. The number of dashes will show the frequency ratio of the sine-wave input to the sweep frequency and is a handy way to check frequency rate.

Turn the Z-axis pot to zero position. Leave the sine-wave signal on the Z-axis input, and inject the same signal into the vertical input of the 'scope, placing several cycles on the tube screen. Turn down the 'scope intensity control until the trace disappears, and advance the Z-amplifier gain control toward positive. The trace should appear similar to Fig. 6 as the cathode-ray-tube grid is driven positive from cut-off by the positive part of the Z-axis signal.

Fig. 6 (left) shows a series of two-microsecond positive pulses which were barely visible on the screen before brightening with intensity modulation, accomplished by injecting the signal into both vertical-input and Z-axis terminals. Fig. 7 shows one cycle of sine wave into the 'scope vertical input with four cycles of square-wave input to the Z axis, and is another method of checking frequency rate.

Fig. 8 (left) shows the horizontal baseline with a marker-signal input to the Z-axis amplifier. The Z-axis gain control is advanced toward positive phase, giving a bright marker on the baseline. Turning the gain control toward negative phase puts a hole in the baseline, as at 8 (right).

Further information on the possible applications of the Z-axis amplifier may be found in Rider's *Encyclopedia on Cathode-Ray Oscilloscopes*.

# Band-Scanning — The Easy Way

## A Simple Means of Automatic Receiver Tuning

BY K. R. JONES,\* W7OSL

• This simple gadget should appeal to many, both as a novelty and as a utility. It lets you sit back and hear the sigs go by. The lazy man will find it just the thing for watching for band openings. It requires no alterations of the receiver, and can be connected or disconnected in a second or two.

HAVE you ever spent valuable time tuning across the 10-, 15-, or 20-meter bands without finding a single signal? Then you must have wished for an easier way to catch the band openings which are so rare in this period of the sunspot cycle. Perhaps what you need is an automatic tuner to operate the receiver while you sit in an easy chair reading *QST*.

Of course, any well-equipped machine shop could attach an assortment of gears, cranks and motors to your receiver that would do the job, but most hams would prefer to get the results without altering their receivers. It can be done. Most of the needed parts may even be in your junk box now.

The theory is easy. All you have to do is vary the tuning of the receiver's high-frequency oscillator at a slow rate. A motor-driven capacitor clipped on in parallel with the h.f. oscillator tuning capacitor will do the trick, and the only disadvantage is a temporary shift in dial calibration during the time the motor-driven scanning capacitor is in use. Theoretically, the r.f. and mixer tuning should also be varied, but most receivers in the lower-price brackets have only one r.f. stage and the front-end passband is so broad that little loss in gain can be noticed over a small frequency range when only the oscillator is tuned.

The unit illustrated was assembled for use with an NC-57 receiver. An old electric clock motor was used as the base and a scrap of aluminum was bent to form a mounting for a ball-bearing butterfly capacitor, as shown in the photograph. The shaft coupling was made from a small block of plastic. An APC-type padding capacitor was fastened on top and connected in series with the butterfly capacitor to vary the bandwidth scanned. The whole unit is small enough to fit inside the receiver near the tuning-capacitor gang.

Although the unit scans only about 200 kc. on the v.h.f. amateur bands, it has proved very satisfactory in detecting band openings. It has

also been very interesting to operate it on bands where there is plenty of activity. At a rate of two scannings (one complete revolution of the capacitor shaft) per minute, the tuning is covered so slowly that several words can be heard from each station as it is passed, and familiar voices can be recognized.

### Construction

Specifications are listed with the schematic, but as identical parts may not be available, several points in construction should be stressed. First, and most important, is keeping stray

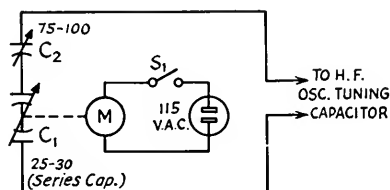


Fig. 1 — Circuit of the simple band-scanner.

C<sub>1</sub> — 35- $\mu$ mf. (stator to stator) ball-bearing butterfly variable (Burstein-Applebee Cat. No. 18B1027). Also see Addendum.

C<sub>2</sub> — APC type air trimmer (see Addendum).

M — Synchronous clock motor, 1 r.p.m.

S<sub>1</sub> — Toggle.

capacitance at a minimum since this will have a considerable effect on how far the r.f. stage must be detuned from normal.

Second, the butterfly capacitor must turn very easily. The ball-bearing type shown is ideal, but with some ingenuity in loosening and lubricating the bearings, a plain-bearing type might be satisfactory. A capacitor with a stop cannot be used, of course.

Third, the capacitor shaft should be very carefully aligned with the motor shaft to prevent excessive bearing friction and overloading of the motor during constant use. If the alignment cannot be done accurately, a flexible shaft coupling should be used.

Fourth, any different type of motor than a clock motor should be checked for radio interference before construction is begun. The synchronous clock motor shown caused no interference while operating inside the receiver, but other small motors could generate a great deal of noise.

Fifth, the 115-volt wiring to the motor should be carefully insulated. Every amateur should realize that 115 volts a.c. is potentially just as dangerous as the higher d.c. plate voltages found in power supplies.

\* 627 Fifth Ave., Salt Lake City, Utah.

### Adjustment

Adjusting the scanner for operation is not difficult with the following procedure:

1) Set the butterfly capacitor to approximately the center of its capacitance range by running the motor through part of a revolution.

2) Attach the lead clips in parallel with the receiver oscillator tuning capacitor. On the NC-57 this is the capacitor section next to the front panel. The lead from the APC padder should attach to the stator, and the other lead to the capacitor frame.

3) Use a VFO, crystal oscillator, or signal generator to obtain a strong signal in the middle of the desired band. Tune in this signal with the receiver tuning dial. Since the scanning unit adds capacitance in parallel with the tuning capacitor of the receiver, the setting may be one to several hundred kilocycles higher than the normal dial setting.

4) Peak the signal with the antenna-trimmer control if the receiver has one.

5) Run the butterfly capacitor to its maximum and minimum settings and check these frequencies with the VFO or signal generator. Then adjust the APC trimmer to more capacitance for a wider scanning range or to less capacitance for narrower scanning range. (The total capacity added by the unit is of course equal to  $\frac{C_1 \times C_2}{C_1 + C_2}$ , so, by decreasing  $C_2$ , the total capacitance and the scanning width are reduced.)

6) Repeat Steps 3, 4, and 5 until the desired range is covered.

The amount of receiver tuning capacitance in use is different on each amateur band, so the scanner must be readjusted for each band.

To restore normal receiver operation, just unclip the scanner, lift it out, and reset the antenna trimmer. This scheme is, of course,

not useful with receivers whose tuning ranges are restricted to the amateur bands.

### Addendum

The scanning capacitor used by the author, being of the butterfly type, goes through its capacitance range four times for one complete revolution of its shaft, and therefore the band is swept four times — twice in each direction. The butterfly type with ball bearings may not be generally available on the market. However, the standard-type Hammarlund VU-30 should make a satisfactory substitute, although it will take twice as long to sweep the band (twice per revolution instead of four times). The VU-30 has a maximum resultant capacitance (two sections in series) of 31.5  $\mu\text{mf}$ .

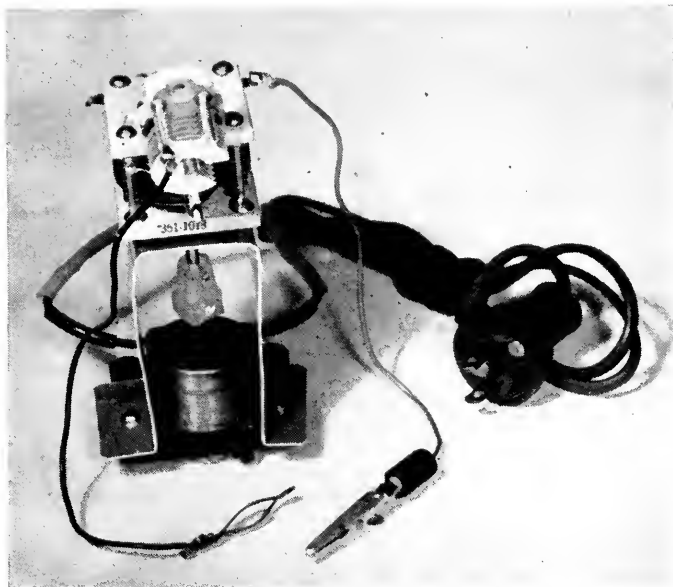
To obtain an idea of the range to be expected on the various lower-frequency bands, the arrangement of Fig. 1 was tried on a Hallicrafters SX-71, with a Johnson 27- $\mu\text{mf}$ . capacitor at  $C_1$ , and a 100- $\mu\text{mf}$ . unit at  $C_2$ .

With  $C_2$  set at minimum, the band-set on the SX-71 had to be readjusted about 200 kc. higher, and the tuning range of  $C_1$  was approximately 40 kc. With  $C_2$  set at maximum, the band-set had to be set about 300 kc. higher, and the range of  $C_1$  was about 300 kc.

On 40, the band-set was adjusted about 200 kc. higher,  $C_2$  at minimum, and the tuning range was about 40 kc. With  $C_2$  at maximum, the band-set was about 250 kc. higher, and the range slightly over 300 kc.

On the 20- and 10-meter bands, the band-set adjustment was only slightly different than normal. On 20, the bandspread range of  $C_1$  could be varied from about 30 kc., with  $C_2$  at minimum, to about 300 kc. with  $C_2$  at maximum. The range on 10 was about 2 Mc. with  $C_2$  at minimum, and with  $C_2$  set at about half capacitance, the entire band was covered.

This simple band-scanner can be thrown together in a few minutes. The ball-bearing capacitor driven by the clock motor is mounted, with its shaft in line with that of the motor, on a scrap of aluminum. The range-adjusting capacitor,  $C_2$ , is suspended from  $C_1$  on stiff leads connecting it to the latter.



# A Tripler for the 1215-Mc. Band

*Crystal-Controlled Output with 420-Mc. Drive*

BY RUSSELL W. ROBERTSON,\* W6DQJ

• Most of the work done so far on 1215 Mc. has been with oscillator-type rigs, which leave much to be desired in the way of stability and efficiency. Here is a solution in line with more modern techniques: a tripler that can be driven with a low-powered 420-Mc. stage.

Now that the design of stable equipment for the 420-Mc. band is fairly well standardized, experimentally inclined hams are thinking of going higher in frequency. Most of the work done so far on 1215 Mc. and higher bands has been with oscillator-type transmitters. This can be fun, but experience has shown, as on all lower bands, that if we are to accomplish any real good it must be with something more stable and reliable in performance.

Choice of tubes for use as frequency multipliers or r.f. amplifiers is limited enough at 420 Mc. When we go to 1215, there is practically no choice at all. The lighthouse types such as the 2C40 and 2C43 work well at very low power, but if we want to go over the milliwatt level we have only the 2C39A to look to. There are bigger tubes, of course, but their cost puts them out of the reach of most hams.

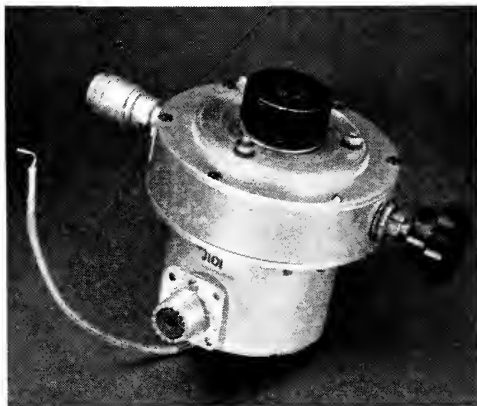
Tank-circuit design definitely leaves the coil-and-condenser field when we move up from 420 Mc. This shift from coils to lines to cavities leaves the average ham with the feeling of having entered another world, but construction of suitable cavities can be managed without too much in the way of machine tools. The tripler described here is a combination of modified surplus and home-made tank circuits that should not be beyond the ability of many experimenters.

The photographs show the tripler in both assembled and knocked-down form. The input circuit was made from a coaxial tank circuit of an r.f. amplifier from an ASB-series receiver designed for 450 to 500 Mc. Enough detail is apparent so that a near duplicate could be made, if the surplus variety is not available, though having the ASB cavity makes the job quite a bit simpler. The original amplifier was designed for use with a 446A lighthouse tube, but most of the parts can be salvaged for this application with the 2C39A.

## *Making the Cavities*

The ASB cavity, if used, should be cut apart carefully so that it is  $1\frac{3}{4}$  inches long. The inside diameter is  $2\frac{3}{16}$  inches. The original cathode ring is salvaged for use as a plate contact for the 2C39A. The grid ring is used for the grid contact

for the 2C39A, also. Both these are spring-contact finger stock and are probably the most difficult parts to make if suitable materials are not at hand. The plate line of the 446A is cut to a length of  $1\frac{7}{16}$  inches, and then slotted to take the cathode sleeve of the 2C39A. The insert that originally held the plate contact to the plate line is slotted to a depth of about  $\frac{3}{16}$  inch, and then pinched together slightly to fit into the heater connection on the 2C39A. Heater voltage should be fed through shielded wire. Insert the



The tripler for 1215 Mc. uses a 2C39A tube. The small cylinder at the bottom of the assembly is the 420-Mc. cathode tank circuit, and the 1215-Mc. tank is a radial cavity. Air should be blown across the plate fins in normal operation.

heater connection in the end of the tube before putting the tube into the cavity.

The radial plate cavity is made of thick-wall aluminum tubing, 3 inches inside diameter and  $2\frac{5}{32}$  inch long. Silver-plated brass would be fine, if you can manage it. Top and bottom covers are  $\frac{3}{32}$ -inch aluminum, fastened to the cylinder with six No. 4 screws each. The bottom cover is drilled and countersunk to take four 6-32 flat-head machine screws that hold the cathode line onto the assembly. The cars into which these screws thread are integral parts of the ASB tank circuit.

Both grid and plate contact rings are insulated from the case for d.c., but there must be capacitance to the case to make the cavities function properly. The rings are separated from the cavity by sheets of Teflon, though any good insulation that will stand heat may be used. The grid contact ring is held to the cathode side of the bottom cover by a round sheet of flashing copper,  $2\frac{1}{4}$  inches in diameter. The screws that hold this in place must, of course, be insulated from either the copper plate or the cover. In the photograph, a short insulated lead for the grid leak is shown

\* 8118 S. Chaney Ave., Rivera, Calif.

attached to a lug under one of the nuts that holds this assembly together. The screw is insulated from the cavity. The other three screws are insulated from the copper plate, but not from the cavity. The plate contact ring, on the top of the cavity, is treated in like manner, except that only three screws are used. One of these makes contact to the ring and is used for a plate-voltage terminal. The other two are insulated from the ring, but not the cover.

Inductive coupling is used for both input and output. Details of the coupling loops should be clear from the photographs. The cathode cavity is tuned by means of a disk capacitor, the fixed plate of which is part of the cathode line. The movable plate is mounted on a fine-thread screw, which runs through a threaded fitting attached to the inner wall of the cavity. The end of the screw is slotted to permit adjustment from outside the cavity. Coupling out of the cavity can be varied by turning the Type N coaxial fitting. Maximum coupling is with the loop vertical. This position is indicated with a dot of red paint on the sleeve so placed that it lines up with the slot in the fixed portion of the fitting when the loop is vertical. Normal coupling is about 15 degrees from the vertical position. Tuning is done with a  $\frac{1}{4} \times \frac{5}{8} \times \frac{3}{8}$ -inch piece of copper, fastened to a  $\frac{1}{4}$ -inch polystyrene rod that is brought out through a shaft bearing. Pulling the rod out raises the tuning range higher in frequency. Normal tuning is done by rotating the rod.

### Operation

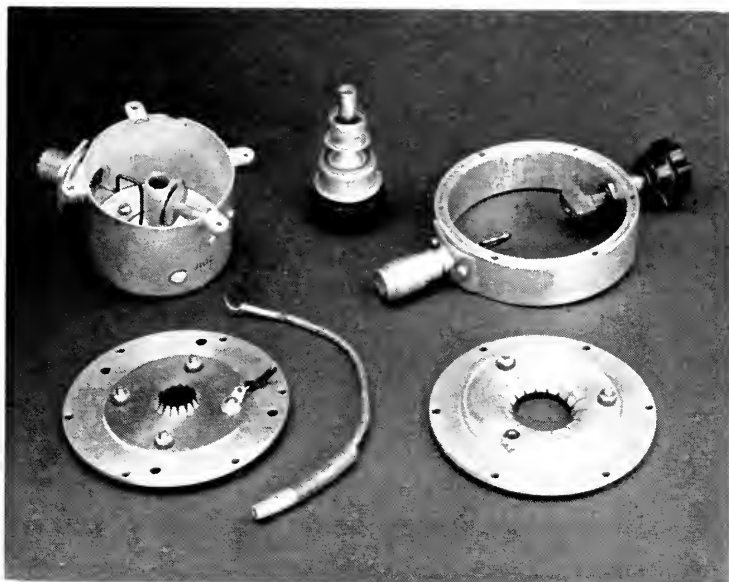
Drive for the tripler is furnished by a 9903 tripler to 432 Mc. With a 10,000-ohm grid resistor, grid current in the 2C39A is about 12 ma., dropping to 10 under load. So far the tube has been operated at no more than 450 volts, as no cooling has been used. At this voltage the plate current dips to 35 to 40 ma. at resonance.

No means of measuring output is available, but the appreciable dip indicates that fair efficiency can be expected.

Sufficient cooling for low-power operation may be obtained by blowing air across the tube's plate fins. If anything approaching the maximum rating for the tube is to be run, a cowling should be used around the cooling fins, to confine the air flow where it will do the most good. Air should also be blown through the cathode cavity. Holes should be drilled in this cavity for ventilation, even at low power levels. Air flow should be increased as the plate dissipation is raised. With no cowling, a flow of 10 cubic feet per minute will take care of up to 40 watts plate dissipation. With a cowling just larger than the plate fins, 10 c.f.m. will allow up to 85 watts dissipation. Running the maximum of 100 watts dissipation raises the air requirement to about 13 c.f.m. There should be a forced air flow through the cathode cavity if more than about 25 watts dissipation is anticipated.

The 2C39A should be inserted into and removed from the cavity with care. The grid plane is held to the glass seal with only a ring of cement; it can be broken loose very easily if any strain is applied to the grid, cathode or heater terminals. Remember, too, that the top plate is hot for d.c. Do not attempt to handle the cavity when plate voltage is applied.

In a cavity very similar to the one described here, it was found that the tube could be made to oscillate by reducing the capacitance in the cathode circuit. The grid resistor was reduced to 1200 ohms for this purpose. The oscillation frequency was around 1280 Mc., but by some re-tuning of the cathode cavity the frequency was changed to about 969 Mc. Obviously some accurate method of checking frequency should be available before operation of the unit as an oscillator is attempted.



Components of the 1215-Mc. tripler. Lower left: bottom plate of the 1215-Mc. plate cavity, showing grid-contact ring and capacitor plate. Right front: top cover, with plate-contact ring and bypass element. Upper left shows interior of the cathode cavity, with the radial plate cavity in the upper right. The 2C39A and the heater contact lead are in the center of the picture.

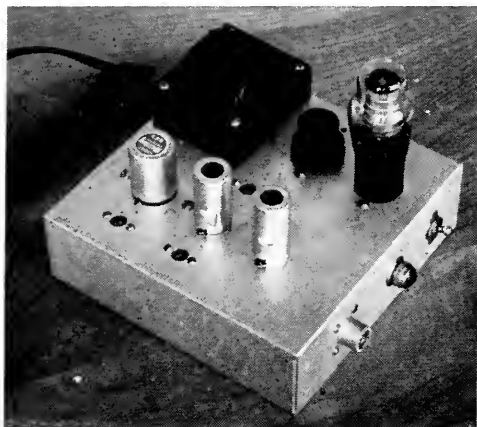


# Subinterval Markers from a 100-Kc. Crystal

More on Simple Secondary Standards

BY W. C. SMITH,\* K6DYX

BEING in possession of an old and uncalibrated receiver, the article, "50-Kc. Markers from a 100-Kc. Crystal," *QST*, July, 1954, was of particular interest to me. If this circuit would divide a frequency by two, why not by five, or even ten, and yield markers every 20 or 10 kc.?



The crystal calibrator unit complete with power supply.

With this possibility in mind and, with the help of H. Minor, KN6JIE, the circuit of Fig. 1 was assembled. We carried out extensive tests and

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• This article is supplementary to one that appeared in the July, 1954, issue. K6DYX shows how additional markers at intervals as small as 6½ kc. may be obtained from a 100-kc. crystal. Included is a series of graphs that help to explain the manner in which the circuit works.

think the results would be of interest to other hams.

## Circuit Operation

It was immediately apparent that the explanation offered in the original article is incorrect. The grid resistor has little effect on the frequency of the subharmonics. The cathode by-pass capacitor is likewise ineffective, although there is an optimum range for both these components in their effect on the stability of operation.

The proper explanation seems to be that the relaxation pulse from the screen circuit is fed to the LC network composed of  $L$ ,  $C_1$  and  $C_2$  through the crystal operating at near its series resonant frequency. A transient oscillation is excited in the tuned circuit which, for 50-kc. markers, has a frequency of 350 kc. Thus the grid signal consists of the resonant frequency of the crystal with the frequency of the tuned circuit superimposed upon it (Fig. 2A). The

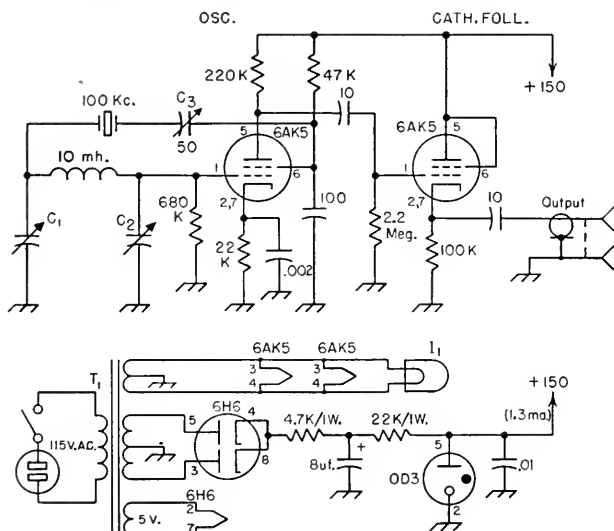
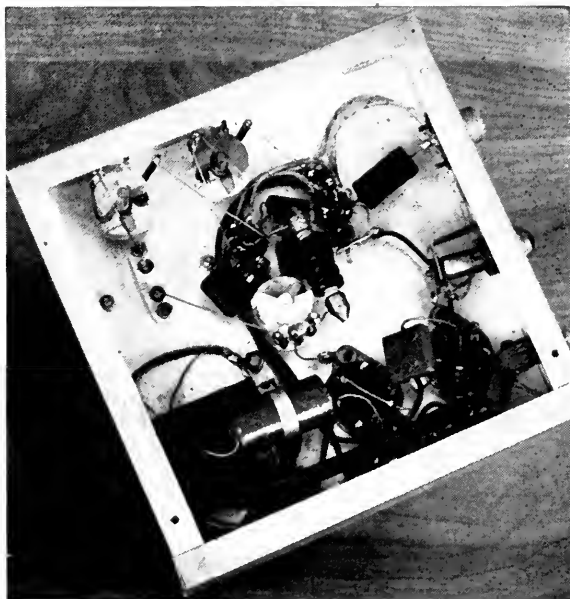


Fig. 1 — Circuit for obtaining subinterval markers from a 100-kc. crystal. All capacitances less than 0.001  $\mu$ f. are in  $\mu$ f.  $C_1$  and  $C_2$  are 50- $\mu$ f. air trimmers. All resistors ½ watt, unless otherwise noted.  $T_1$  — Power transformer: 750 v.c.t., 40 ma.; 5 volts, 2 amp.; 6.3 volts, 2 amp.

Bottom view of the crystal calibrator.



positive crests of this complex wave trigger the tube in such a way that the screen voltage appears as in Fig. 2B, and the output voltage as in Fig. 2C. There is little or no synchronizing action, since the crystal does not feed back any of the 350-ke.



(A)



(B)



(C)

Fig. 2 — Oscillograms when circuit is adjusted for 50-ke. markers. A — Grid voltage. B — Screen voltage. C — Output voltage.

frequency present in the screen voltage. The cathode bias is important, because the tube triggers as its grid returns from beyond cut-off, but the capacitor across the cathode resistor serves only to stabilize the bias, and has no direct effect on the frequency. The time constant of the screen circuit should be less than the period of the crystal for strong relaxation pulses. In this case it is  $47K \times 100 \mu\text{f.} = 4.7$  microseconds, whereas the period of the crystal is 10 microseconds.

### Other Subharmonics

The existence of 50 ke. and harmonics thereof in the output voltage is obvious from Fig. 2C. Here every second one of the 100-ke. sawtooths is distorted. According to the theory of operation given above, it should be possible to distort every third tooth by tuning the  $LC$  circuit to  $333\frac{1}{3}$  ke. and obtain markers every  $33\frac{1}{3}$  ke. This was found to be the case. In fact, it was possible in our set-up to distort the sawtooths at any periodicity up to the 15th, yielding markers every  $6\frac{2}{3}$  ke.! A series of frequencies to which the  $LC$  circuit was tuned, the ratio of these frequencies to the 100-ke. fundamental, and the separation of the marker frequencies is shown in Table I. This is not the only series that will produce subharmonic distortion in this way. A ratio of  $3/2$ ,  $5/2$ ,  $7/2$ ,  $9/2$ , etc., will result in  $1/2$  frequency harmonics. A formula giving the frequency of the tuned circuit,  $L$  with  $C_1$  and  $C_2$  in series across it, is:

$$F_t = nF_1 \neq F_h$$

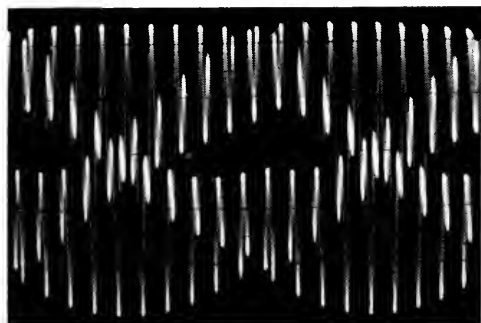
Where  $n$  takes on integral values,  $F_1$  is the fundamental frequency, and  $F_h$  is the frequency separation of the harmonics it is desired to produce. This formula was verified in our experimental work, but the frequencies shown in Table I seemed to work out best.

Fig. 3 shows the grid-voltage wave and the

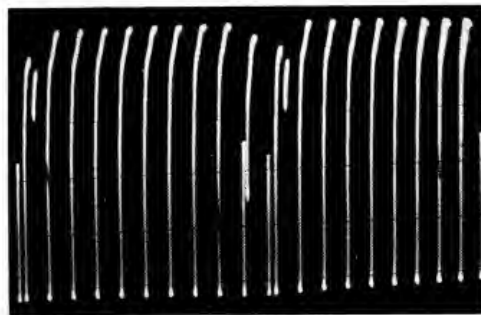
output-voltage wave when the circuit was adjusted for 10-kc. separation of the markers. Note that the frequency ratio in Fig. 3A is clearly 31 to 10. The adjustment of either  $C_1$  or  $C_2$  is rather critical because the frequency of the tuned circuit must be within a few hundred cycles of 310 kc. We found it advisable to use a cathode-follower buffer after the oscillator circuit to avoid detuning when we changed loads. Adjusting the fundamental to exactly 100 kc. is also critical, because tuning the  $LC$  circuit pulls the crystal a little and it is necessary to readjust  $C_3$ .

### Adjustment Procedure

For our experimental work we had available rather ideal equipment in the way of synoscopes and frequency counters, but the unit has been adjusted from scratch and used in the home station with very satisfactory results. The best procedure is to establish oscillation, and adjust either or both  $C_1$  and  $C_2$  until clean markers are heard on the station receiver at 100-kc. intervals.



(A)



(B)

Fig. 3 — Oscillograms obtained when circuit is adjusted for 10-kc. markers. A — Grid voltage. B — Output voltage.

Then tune the receiver to the approximate point where the subinterval marker is desired and adjust either or both  $C_1$  and  $C_2$  until a clear, clean marker is heard. No difficulty at all was experienced in getting markers every 20 kc., but for closer intervals one should check that there are the required number between the 100-kc. points previously noted. After the marker intervals have been established, zero-beat with WWV by adjustment of  $C_3$ .

TABLE I

Frequency of Tuned Circuit, Kc.	Ratio of Tuned Circuit and Crystal Frequencies	Separation of Markers, Kc.
350	7 to 2	50
333 $\frac{1}{3}$	10 to 3	33 $\frac{1}{3}$
325	13 to 4	25
320	16 to 5	20
316 $\frac{2}{3}$	19 to 6	16 $\frac{2}{3}$
314 $\frac{1}{2}$	22 to 7	14.285
312.5	25 to 8	12.5
311.1	28 to 9	11.1
310	31 to 10	10

### Construction

The unit shown in the photographs includes a cathode-follower buffer stage and a built-in power supply with voltage regulation. The circuits of these sections also appear in Fig. 1. The components are assembled on a 7 × 7 × 2-inch aluminum chassis. The power transformer, 6H6 rectifier and 0D3/VR150 voltage-regulator tube are lined up along the right-hand edge of the chassis. At the left are the 100-kc. crystal (at the rear), the oscillator tube, and the cathode-follower tube. A coax output connector, pilot lamp and power switch are set in the front edge of the chassis.

In the bottom view, at the top,  $C_3$  is to the left, and  $C_2$  to the right.  $C_1$  may be seen near the center. Clearance holes have been cut in the chassis so that these three variable capacitors can be adjusted from the top with a screwdriver.

### Silent Keys

IT is with deep regret that we record the passing of these amateurs:

W1AFT, Bernard Seamon, Wiscasset, Me.  
W1BBL, Frank G. Cheever, Manchester, Mass.  
W1UHR, Henry A. Starkel, West Hartford, Conn.  
W2CZV, ex-W2BKG, Joseph D. Braman, Woodhaven, L. I., N. Y.  
W2GLY, Geroge W. Weidman, Haddon Heights, N. J.  
ex-W3BAQ, ex-3BAQ, Theodore Torretti, Trenton, N. J.  
ex-3JJ, Louis J. Kneeshaw, Trenton, N. J.  
W3MCF, ex-WSION, Paul K. Secor, Sayre, Pa.  
W4BYN, Herman Rieben, Memphis, Tenn.  
W4MZN, Everett G. Hemenway, Covington, Va.  
W6LJO, Horace A. Bodine, Los Angeles, Calif.  
W6PBM, Leland M. Anderson, Woodland, Calif.  
W7FT, Wilson P. Boyd, Heyburn, Ida.  
W7HIV, Marvin S. Worthley, Portland, Ore.  
W8HFQ, LeRoy C. Bridgman, Garden City, Mich.  
W8HFF, Maynard A. Nelson, Sylvania, Ohio  
W8PBK, Fred P. Manderscheid, Detroit, Mich.  
W8PTD, Charles W. Woodward, Detroit, Mich.  
W9URC, Wayman C. Herkless, Indianapolis, Ind.  
EI7U, Dick Murphy, Dublin  
G5HU, ex-GI5HU, Robert S. Holden, Sheffield, Yorkshire  
HB9DQ, Otto Disteli, Sainte-Croix, Vaud  
PY7AJ, Joao Baptista de Carvalho, Olinda, Pernambuco  
VK2DG, Keith Rudkin, East Maitland  
VK5CR, C. R. Cheel, Maylands

# Six Meters for the Beginner

## Part III — Transmitting Equipment and Antennas

BY EDWARD P. TILTON, W1HDQ

THE 50-Mc. band is attractive to the fellow who is just getting started in that it is still possible to do interesting work on 6 with very low power. Increasing power pays off, of course, but plenty of good stuff has been worked with no more than a few watts. The kind of work you expect to do will determine how much power you will need.

If you want only a rig that will give you a good signal locally, there is little reason to go beyond the receiving tube power level. Something like the rig described here will do the job nicely, and it will help the interference problem markedly if you stick with low power. It may surprise you to learn that a 10-watt rig is quite capable of giving a good account of itself when the band is open, too. When sporadic-E skip communication is possible at all, signals are usually quite strong; thus there is not a large difference in results whether high or low power is used. Under borderline conditions, the extra margin over the noise that the high-powered signal enjoys is a major factor in making contacts, but there is probably no field in which low power works out to better advantage than in 6-meter DX. There is no real QRM, and it is unlikely that there ever will be, so we don't need high power to override other stations on the same frequency.

High power does pay off handsomely in one phase of v.h.f. work. To have a wide reliable operating radius you have to lick one enemy: the noise level. The edge of your normal coverage is the point at which your signal disappears into the receiver noise. This is farther out when high power is used, whether you're working on 50, 144, 220 or 420 Mc. (That's why we have super-powered TV stations.) If your signal is running S9 at the receiving point, increasing power from 10 to 100 watts (10 db., or about 2 S-units) won't sound like much. But if you are just a whisker over the noise, that 10 db. will put you right up there in the solidly-readable category.

When you're after that additional 10 db. of signal, the first place to go all-out is in the antenna. Decibels come easier and cheaper there than in the transmitter. In v.h.f. work it is approaching the ridiculous to increase power while using an ineffective antenna. On 80 you may have to put up with a makeshift, but on 6 almost everyone can manage an array that will give good results.

With TV antenna components and rotators available at moderate cost, there is little reason for not having a rotatable array. Even a dipole works well if you can aim it in the right direction for every station, and two or three elements will do a real job. If you *have* to, you can make con-

tacts on 6 with an antenna designed for lower frequencies, but the chances are that it won't do nearly as well as even the simplest rotatable antenna system designed for the job. If you can put up a 4-element array of the type described in all recent editions of the *Handbook*, you'll have gained as much, in respect to coverage with a dipole, as would result from increasing your transmitter power from 10 to 100 watts. It will pay a much larger dividend, actually, for it will increase your receiving performance by at least as great a factor.

### A Low-Cost 10-Watt Transmitter

The little rig pictured here will take an input of 10 to 15 watts, when used with a 300-volt plate



A 2-tube 50-Mc. transmitter, capable of running 10 to 15 watts input. The 4-pin connector on the front wall of the chassis may be plugged directly into the modulator, or a cable may be run between the two units. Tip jacks on the left end of the chassis are for measuring final-stage grid and cathode current.

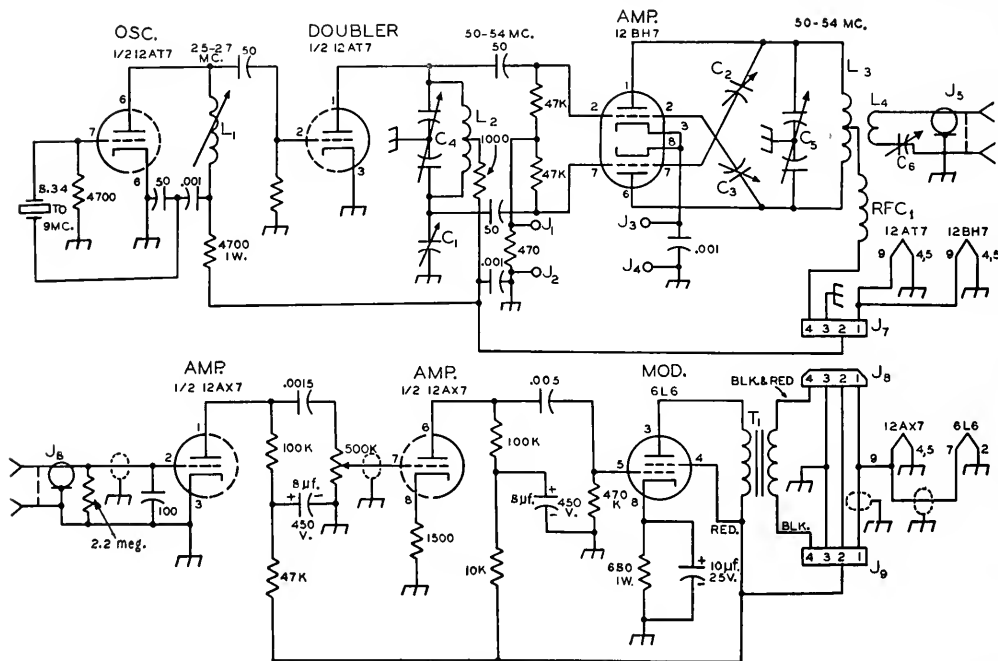
supply, and it can be adapted readily to portable or mobile, as well as home-station use. When used in conjunction with the modulator described in *QST* for December, 1954, it makes a complete 'phone-c.w. transmitter that will give a good account of itself on 6. After you've made your start with the rig as described, it may be used to drive higher power stages at a later date.

Two dual triode tubes are used. A 12AT7 serves as an overtone oscillator and doubler, using 8.3- or 25-Mc. crystals. Output is on 50 Mc., driving a 12BH7 push-pull amplifier. The second tube can also be a 12AT7, but the larger tube handles the power more readily. The rig fits a 5 by 7 by 2-inch aluminum chassis, with plenty of room to spare.

Building the transmitter r.f. section and modulator in separate units is highly recommended, as the r.f. section for another band can be plugged into the modulator at any time. If you decide to make changes in either unit, the other can be left

Power is brought into the transmitter through a 4-pin fitting on the front wall of the chassis. This plugs into a matching fitting on the adjacent wall of the modulator unit. If it is desirable to mount the r.f. and modulator units separately, the two may be connected by a 4-wire cable of any convenient length. On the left edge of the chassis are two pairs of tip jacks for measur-

Photographs of the modulator unit will be found in December, 1954, *QST*, pages 27 and 30. Arrangement of modulator parts is not critical. The complete diagram and parts required are given here, so that the unit may be built without reference to the earlier article, if necessary. Some minor modifications are included, so follow the



C<sub>1</sub>, C<sub>2</sub>, C<sub>3</sub>—0.5—5- $\mu$ f. plastic trimmer (Eric style 532-080R5).  
C<sub>4</sub>, C<sub>5</sub>—11- $\mu$ f. miniature butterfly (Johnson 11MB11).  
C<sub>6</sub>—20- $\mu$ f. miniature variable (Johnson 20M11).  
L<sub>1</sub>—20 turns No. 28 enam., close-wound on  $\frac{3}{8}$ -inch iron-slug form (National XR-91). Wind near top.  
L<sub>2</sub>—12 turns No. 20  $\frac{1}{2}$ -inch diam., spaced diameter of wire, center-tapped. (B & W Miniductor No. 3003).  
L<sub>3</sub>—5 turns each side of center, B & W No. 3003, 5/16-inch space at center for L<sub>4</sub>.

- L4 — 3 turns No. 20 enam., 1/2-inch diam., close-wound.  
Place between halves of L3.  
J1, J3 — Insulated tip jack.  
J2, J4 — Tip jack — not insulated from chassis.  
J5 — Single phono-type jack (Cinch No. 81A).  
J6 — Microphone connector (Amphenol 75-PC1M).  
J7, J8 — 4-pin male chassis fitting (Amphenol 86-RCP4).  
J9 — 4-pin female fitting (Amphenol 78-RS4).  
RFC1 — Solenoid v.h.f. r.f. choke (Ohmite Z-50).  
T1 — Modulation transformer, 10-watt (Merit A-3003).

Bottom view of the 50-Mc. transmitter. Oscillator and doubler circuits are at the left. The amplifier tube socket is near the middle of the chassis, with the plate and output-coupling circuits at the right.

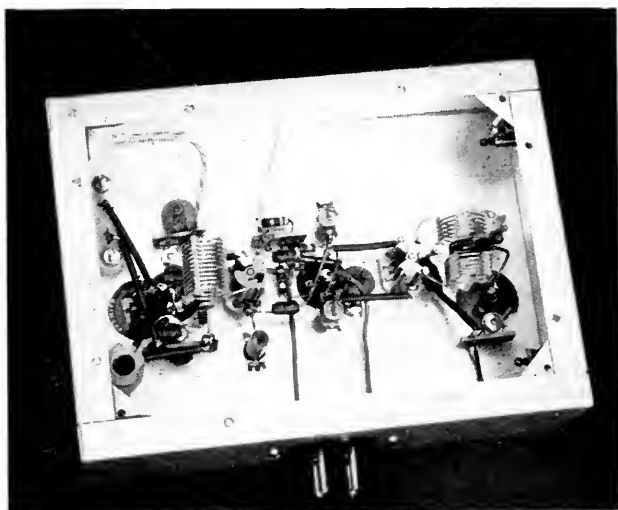


diagram given here, not the earlier one, in wiring the modulator. The power supply may be connected either through the modulator, or directly to the r.f. section. This permits operation of the transmitter on c.w. while the modulator unit is under construction.

The modulator was shown originally with a 6V6GT in the output stage. This may be used with the 50-Mc. transmitter, but more audio can be developed with a 6L6. If the rig is used for mobile work, retention of the 6V6GT would be advisable, in the interest of lower power drain. When the latter is used, the total power drain, with a 300-volt supply, is less than 100 ma., making it very suitable for operation from a vibrator or generator supply.

### Adjustment

In hooking up the power supply a cable should be made up with a 4-pin female plug (Amphenol 78-PF4). This will attach to either  $J_9$  or  $J_7$ . The hot side of the 6.3-volt circuit (a.c. or d.c.) should be connected to Pin 1, the cold side and the negative side of the high-voltage circuit to Pin 3. The 300-volt lead is brought to Pin 2. This will energize the oscillator, doubler and audio circuits, but not the amplifier. It will be helpful if the power supply has a separate filament transformer for the transmitter heaters. In this way the tubes can be warmed up before applying the plate power, which will increase tube life. It will also make it possible to operate a 115-volt a.c. antenna relay, connected in parallel with the primary of the plate supply transformer, to switch the antenna to the transmitter when the plate power is applied.

Connect a short temporarily between pin jacks  $J_3$  and  $J_4$ , to close the final stage cathode circuit to ground. Connect a low-range milliammeter, preferably 0-5 or 0-10 ma., in pin jacks  $J_1$  and  $J_2$ , to measure the current developed in the final amplifier grid circuit when drive is applied. The positive terminal of the meter is connected to  $J_2$ . If a low-range meter is not available, a 100-ma.

meter, that will later be used to measure the final plate current, may be substituted. It will be hard to read current accurately on this scale, however.

If a power supply delivering 200 volts or so is available it may be used for initial tests on the r.f. section. If a 300-volt source is used, do not leave it on longer than necessary, until the stages are tuned up properly, as damage to the tubes may result during off-resonance operation. With the tubes hot, apply plate voltage. Have  $C_4$  set near the midpoint of its tuning range,  $C_1$  near minimum, and  $C_2$  and  $C_3$  set with their brass slugs about halfway into the brass sleeves. If the coils are the proper size, and the circuits properly wired, there should be grid current showing on the meter connected to  $J_1$  and  $J_2$ .

Adjust the position of the slug in  $L_1$  quickly for maximum amplifier grid current, and then tune  $C_4$  to see if it can be increased further. Depending on the characteristics of the crystal used, there may be oscillation only over part of the tuning range of  $L_1$ . In this case, grid current in the amplifier will appear suddenly as the coil slug is tuned through the resonance point. With some crystals oscillation may not start every time the plate voltage is applied if the coil is tuned exactly "on the nose" for maximum output. With it set for maximum amplifier grid current, apply plate voltage several times to be sure that the crystal always starts. Should it not do so, detune the coil slightly until easy and reliable starting is obtained.

It will be noted that the plate circuit of the doubler has a center-tapped coil tuned with a split-stator capacitor. R.f. power is coupled from both ends of this circuit into the grids of the amplifier. The output capacitance of the 12AT7 is in parallel with the upper half of the circuit, so some extra capacitance must be added at the bottom to achieve balanced drive. This is done with  $C_1$ , which should be adjusted for maximum grid current in the amplifier, readjusting  $C_4$  each time the setting is changed. It is not critical.

Before going any further, the frequencies in

the two stages should be checked. This can be done with a calibrated absorption wavemeter or grid-dip meter. Output from the oscillator should be on 25 to 27 Mc., the doubler between 50 and 54 Mc. Frequency can also be checked with a receiver that is capable of tuning these ranges, if you can be sure of its calibration. This is a somewhat risky business, however, as many spurious responses may show up in the receiver, and it is often difficult to tell when you have the right signal tuned in.

A listening check should be made to determine that the frequency is crystal controlled. With the receiver b.f.o. on, the signal should have a clear musical tone, and the frequency should show very little change when a metal object is moved near the oscillator plate coil,  $L_1$ .

The next step is neutralization of the amplifier. With no plate voltage on the 12BH7, tune its

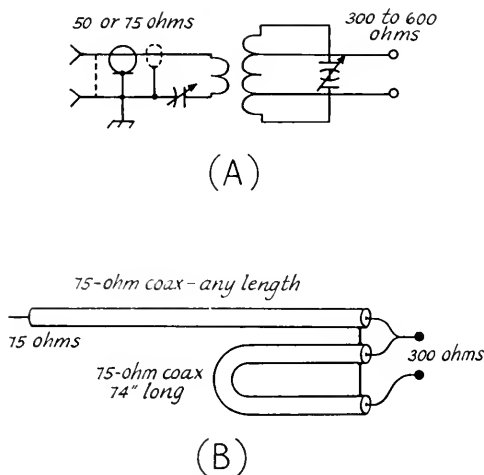


Fig. 2—Two methods of feeding balanced lines or antennas with coax. The antenna coupler, above, can use components similar to those in the final stage plate circuit. Any impedance coax can be matched to any impedance balanced load, up to 600 ohms. The balun, B, gives a 4-to-1 impedance step-up. The outer conductors may be grounded to the antenna boom or mast.

plate circuit (with  $C_6$ ) through resonance, watching for variation in grid current. The latter is likely to drop sharply as resonance is reached. Adjust the neutralizing capacitors, keeping them at approximately equal settings, and check for the amount of grid-current dip at resonance, increasing or decreasing the capacitance of  $C_2$  and  $C_3$  until the grid-current dip disappears.

Now we're ready to check the final stage. Connect a 0-100 milliammeter between Pins 2 and 4 of the plug on the power cable. This will apply plate voltage to the final stage, and indicate its plate current. Tune  $C_5$  for minimum plate current, which will be about 5 to 10 ma. Now connect a lamp load to the output. This can be a 10- or 15-watt lamp, or four No. 44 (blue-bead) pilot lamps connected in parallel. None of these lamps will make a good load, but any will do for the initial check. With the load connected, tune the

series capacitor and retune the plate capacitor for maximum brilliance in the load lamp. This should show an output of about 5 watts, with an input of 10 or so. The position of the coupling coil,  $L_4$ , should be at the point of lowest coupling to  $L_3$  that will give the desired loading. Normal plate current, under load, will be about 40 ma., with a 300-volt plate supply.

The modulator is designed for use with a crystal or high-impedance dynamic microphone. The speech amplifier stages provide adequate gain, so long as the operator speaks directly into the microphone, at a distance of not more than two inches. A rough check on the required voice and gain levels can be obtained by watching the load lamp. There should be appreciable brightening of the lamp with ordinary speech.

The final stage may be keyed for c.w. operation by plugging a key into the tip jacks,  $J_3$  and  $J_4$ . With the key open no current will be drawn by the final stage. Stations nearby will hear the oscillator-doubler output, and will report "back-wave" when the key is up, but more distant stations will not hear this radiation to an appreciable extent. The cathode jacks may also be used for a meter, which will read the combined grid and plate currents. If neither key nor meter is connected, a short should be inserted in the jacks to close the cathode circuit. A conventional closed-circuit jack may, of course, be substituted for the tip jacks.

The same is true of the grid-current jacks,  $J_1$  and  $J_2$ , except that a resistor is connected permanently between their terminals, so whether or not a grid meter is connected will make no difference in the operation of the amplifier.

Normal operation of the transmitter, with 300-volt supply, will show approximately the following indications:

- Oscillator and doubler plate circuits — 10 ma. each.
- Final grid circuit — 4 ma.
- Final plate current — 35 to 50 ma.
- Output — 4 to 7 watts.

### Coupling to the Antenna

Any recent edition of *The Radio Amateur's Handbook* or *The ARRL Antenna Book* will give you dimensions and construction ideas for 50-Mc. antennas. If you want to feed your array with coaxial line, the feedline may be plugged directly into the output connector,  $J_5$ . In this case no further coupling devices are required, and adjustment involves only tuning  $C_6$  for maximum loading. Retune  $C_5$  each time an adjustment is made, to be sure that the final stage is tuned for minimum plate current. The position of the coupling loop,  $L_4$ , should be set so that 35 to 40 ma. plate current is drawn with the antenna connected.

If a long run of transmission line is required between the rig and the antenna system, lower line losses will be encountered if open-wire line is used. This will require some form of antenna coupler or balun, to take care of the transformation from the unbalanced coax to the balanced open-wire line.

(Continued on page 122)



# An Inexpensive Battery Charger for Field Use

BY J. S. REDDIE,\* W7FVI

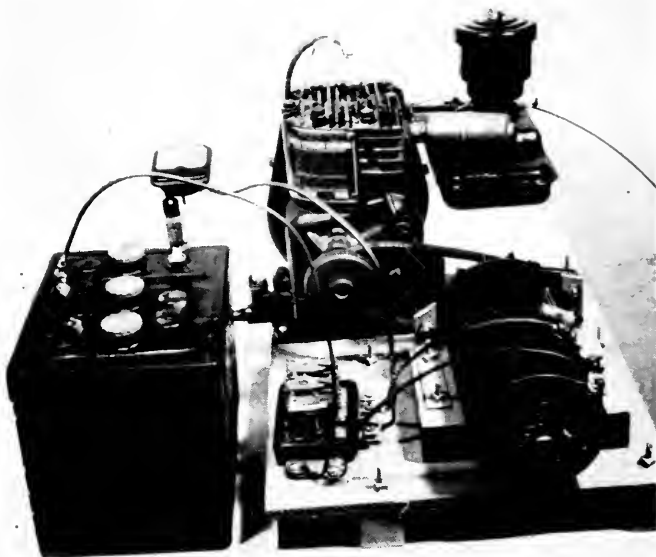
**M**OBILE and emergency-powered portable stations in the 5- to 25-watt class depend almost exclusively upon the storage battery as the primary source of power. A single, fully-charged 100-ampere-hour battery enables a station to stay on the air continuously for 5 to 10 hours at the 10- to 20-ampere discharge rate demanded of the battery. For operation over longer periods than this, it is necessary to provide additional electric energy in the form of either more batteries or a self-powered battery charger. For mobile installations, charging is readily accomplished by the car generator. However, this method is not practical for stations operated in a fixed location,

construct the 6-volt 30-ampere charger.

The gasoline engine, generator and regulator were rigidly mounted on a simple wooden frame. The regulator, shown in the lower left-hand corner of the charger, is wired so as to use only the cut-out section of the unit; its only purpose here is to prevent a reverse flow of current at low engine speeds. At normal engine speeds, full power is supplied to the battery.

The drive mechanism utilizes the same system employed in the power mower. At low engine speeds, the automatic clutch on the engine drive shaft is disengaged and no power is supplied to the V belt. As the engine speed is increased,

Only a few hours are required to assemble this 30-ampere charger. If you happen to have a gasoline-powered lawnmower on hand and can dig up an old car generator and regulator, the cost is negligible.



such as is often encountered in Field Day and civilian defense assignments.

A self-powered charger was assembled at this location with a minimum of time and expense. The unit is lightweight (60 lbs.), potent (30 amp.), and is suitable for continuous operation over extended periods of time.

The 1-horsepower 4-cycle gasoline engine was borrowed from my reel-type power lawnmower, an excess car generator was donated by the brother-in-law, and a much-used regulator was supplied by an interested neighbor. The odds and ends of wood, wire and hardware, plus a d.c. ammeter, were supplied from my own junk box. A few hours' time was all that was needed to

centrifugal force causes the clutch to close, thus enabling the V belt to pick up the load.

Only four bolts hold the engine in place in either the charger or the power mower. Less than five minutes is required to switch the 32-pound engine from one assignment to the other. Those five minutes of time are the only price necessary to keep W7FVI on the air continuously for Field Day and disaster-team commitments.

**Strays**

W2RWY of Dexter, N. Y., is an active c.w. man on 40 meters. His name — Ken Pound!

\* 1918 Lassen, Richland, Wash.

# What's the Answer?

## A Question-and-Answer Quiz for the Beginner

BY LEWIS G. McCOY, WHICP

**I**N answering correspondence from amateurs around the country, it becomes apparent that certain questions repeat more than others. This would indicate that the same problems are shared by many beginners and that it would be helpful to have an article in *QST* discussing these problems. People seem to enjoy quizzes so we have listed the questions in bold-face type and, if you wish, you can try answering them before reading the explanations. If you get all the answers right it indicates that you have a pretty fair radio IQ for a beginner.

### 1. What causes key clicks?

There are two types of clicks. One is caused by electrical sparking at the key contacts. This is the same type of electrical noise you hear in your receiver when someone in the house turns on an electric light switch. Depending on the intensity of the spark generated and the associated wiring, the noise can cover quite a wide frequency range. The electrical noise from this sparking won't travel far—probably not more than a few hundred feet. However, it can cause interference to neighbors' radio reception, so the clicks should be eliminated. This type of click is easy to cure; a simple key-click filter (Fig. 1) at the key contacts will usually get rid of it.

The second type of click is that generated by the actual turning on and off of the transmitted signal. If the signal goes on or off too abruptly,

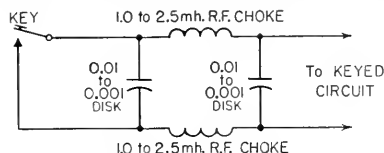


Fig. 1—Key-click filter.

a click will be generated. The clicks will be strongest close to the frequency of the transmitted signal but may extend far enough to cause interference across an amateur band. To get rid of this type of click it is necessary to "shape" the keying. The reader should study the keying chapter in *The Radio Amateur's Handbook*, as proper treatment of shaping procedure is beyond the scope of this article.

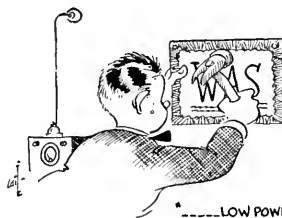
### 2. What causes chirp?

Chirp is a change in frequency as the transmitter is keyed. There are several possible causes for the frequency change. One is the voltage change on the oscillator stage from the key-up condition to key-down. This can be minimized by regulating the screen and plate voltages of the oscillator stage.

Another common cause of chirp is "pulling" of the oscillator frequency by changing conditions in the next stage or stages as the excitation is applied or removed. Changing voltages and currents in the stages following the oscillator "reflect" a variable load on the oscillator and pull the frequency. When such a condition exists it is necessary to have more or better isolation between the oscillator and the changing stage.

When persistent cases of chirp are encountered with several different crystals, one should look at the circuit adjustment. An overloaded oscillator can make any crystal chirp.

### 3. How far can one expect to work with a low-powered transmitter of say 5 or 10 watts input?



This is not an easy question to answer because of the many variables involved. It will depend a great deal on the location, type of antenna used, frequency, time of day and year, and band conditions. The condition of the ionosphere, the region above the earth that reflects radio signals, varies with the time of day, time of year, and the sunspot cycle. However, it would be safe to state that with a fair antenna, and exceptional band conditions, the transmitted signal from a 5- or 10-watt station can reach any country in the world. This holds true for any amateur band from 40 through 10 meters.

One amateur using approximately 35 watts input worked over 100 different countries on the 80-meter band. Many Novices have worked all 48 states using very low power.

### 4. What is the advantage in using the same antenna for transmitting and receiving?

Nearly all antennas will give better performance in certain directions than in others. To illustrate, let's assume we have a transmitting antenna that is good for transmitting in the east-west direction but is poor as far as north and south are concerned. Suppose we have another antenna, used for receiving, that shows good reception on the north-south path. We can call our heads off at stations on the north-south path but because our transmitted signal in this direction is weak, we get no replies. By using

the same antenna for transmitting and receiving, we eliminate this difficulty. It doesn't mean that everybody we call is going to come back but at least we know they *might* hear us. An antenna relay or knife switch can be used to switch the feeders to receiving or transmitting.

**5. When tuning the amplifier plate circuit, which indication is the correct setting for resonance as shown by the plate milliammeter, minimum or maximum current?**

The tuning setting that gives minimum plate current, or the "dip," is resonance in the plate circuit. Normally, the "dip" is the correct setting for getting maximum output from an amplifier. We say "normally" because in amplifiers using screen-grid tubes, maximum output may occur at a setting slightly different than the "dip." The safest method of tuning is to have an r.f. ammeter, or some similar indicating device, in the feed line and then tune the transmitter for maximum output as indicated by the r.f. ammeter. The final amplifier should not be loaded beyond the rated plate current of the tube in use.

**6. What does "crystal-controlled" mean?**

This means the frequency of the oscillator stage is determined by a quartz crystal. A crystal will only oscillate or vibrate at a certain frequency, depending on the dimensions and cut of quartz used in the crystal. Using a crystal-controlled oscillator is one method of making sure the transmitter frequency will be stable. In addition, the transmitter frequency will be accurately known.

The FCC requires that Novices use crystal control of their transmitters.

**7. What is a harmonic?**



A harmonic is a signal that is an integral multiple of the fundamental frequency. It is characteristic of certain types of r.f. generation that when we develop a fundamental signal, we also generate multiples of that frequency. For example, if we generate a signal on 3700 kilocycles, there will also be signals present at 7400 kc., 11,100 kc., 14,800 kc., etc. Normally, these harmonics will be weaker in strength as they go higher in frequency but in many cases they will be strong enough to cause interference to other services unless we do something to attenuate them.

**8. Why are filaments and heaters necessary in vacuum tubes?**

When an electric current is passed through the filament, the wire heats to incandescence.

In a vacuum, when the wire gets hot enough some of the electrons will fly off the filament and cluster around it. If another element is inserted in the tube and a voltage is applied between it and the filament (+ terminal to the new element), the electrons from the filament will flow to the added element.

The emitter of electrons in a vacuum tube is called the "cathode," and the filament described above is a "directly-heated cathode." Indirectly-heated cathodes are also widely used in vacuum tubes. Here a thin sleeve of metal is coated with a material that emits electrons at relatively low temperatures, and a small heater coil is contained within the sleeve. Indirectly-heated cathodes reduce hum problems in audio work that would be encountered with filament-type tubes.

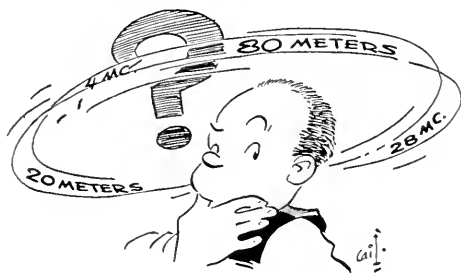
**9. How does a rectifier tube act to change alternating current to direct current?**

As one can see from the explanation of Question No. 8, the filament or cathode of a tube emits electrons which flow to the positive plate element. If an a.c. voltage is applied between plate and cathode, one half of each cycle of the voltage will be positive, the other half negative. During the positive half cycle, electrons from the filament will flow to the plate. Current will not flow during the negative half cycle. This gives us a pulsating d.c. which can then be run through a filter to smooth out the ripple that will be present.

**10. How fast does a radio signal travel?**

Radio signals travel at the same speed as light waves, approximately 186,000 miles per second. In this connection, it is interesting to note that recently two amateurs beamed a signal at the moon and then listened for the reflected signal. The signal had to travel a distance of some 440,000 miles to get to the moon and back. With radio traveling at the speed of light, the distance would be covered in about 2½ seconds. You can imagine the thrill the two amateurs experienced when they sent the signal and then a couple of seconds later heard the faint "beep" of the returning signal.

**11. What is the relationship of the 80-meter band to the 3.5-megacycle band?**



They are the same. Probably one of the most confusing things the newcomer encounters is the reference to amateur bands by either meters or

(Continued on page 124)

# Lightning Protection for the Transmitting Antenna

## Grounded System for Open-Wire Feeders

BY R. C. CORDERMAN,\* W4ZG

**A**n old adage says lightning never strikes twice in the same place. You may not agree with this, but if it strikes you once it won't make any difference whether you do or don't agree.

Radio amateurs for the most part invite destruction by lightning by neglecting to provide any protection against it. The antenna usually associated with amateur radio transmitting equipment is most vulnerable to lightning due to its length and height. To validate your insurance, your antenna installation must comply with the National Board of Fire Underwriters Electrical Code which says:

*Lightning Arresters—Transmitting Stations.* Except where protected by a continuous metallic shield (coax) which is permanently and effectively grounded, or the antenna is permanently and effectively grounded, each conductor of a lead-in for outdoor antenna shall be provided with a lightning arrester or other suitable means which will drain static charges from the antenna system.

A similar requirement is applicable to a receiving antenna should it extend outside the

• Lightning protection for the amateur transmitting antenna, especially when open-wire feeders are used, has been largely neglected. W4ZG points out the dangers involved and offers some simple solutions.

ages can build up on an antenna due to other causes. About 1920, while attending Carnegie Tech, Pittsburgh, Penna., an experience was observed which will be of interest in this connection. The antenna at 8XC consisted of 10 wires 600 feet long, approximately 165 feet above the ground at its center. It ran across a gully, at the bottom of which was a mainline railroad track. When locomotives pulling heavy trains passed under the antenna, the static charge built up was sufficient to cause flash-over of an 8-inch gap. The flash repeated approximately every five

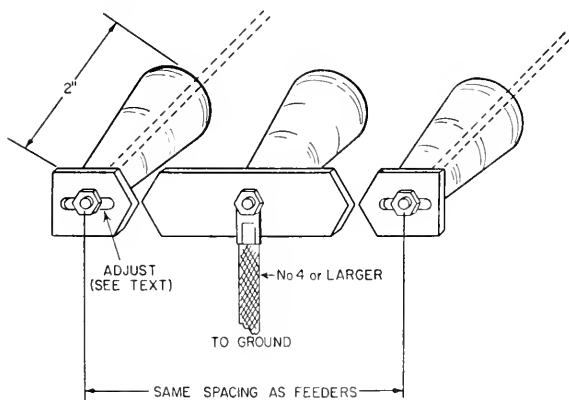


Fig. 1—A simple lightning arrester made from three stand-off or feed-through insulators and sections of  $\frac{1}{8}$ -inch-thick brass or copper bar.

building in which the receiving equipment is located.

Many years ago my antenna was struck by lightning. At that time, there was an insurance requirement which said that a 100-ampere switch should be used for grounding the antenna when the station was not in operation. The lightning completely destroyed most of the antenna wire, burned the wooden base of the lightning switch and burned the insulation off the No. 4 copper grounding wire between the switch and the ground stake. As the switch was in the grounded position, no damage to the house or radio equipment resulted.

Without adequate grounding, hazardous volt-

\* 792 Oaklawn Ave., Winston-Salem, N. C.

seconds while the engine was immediately beneath the antenna and less frequently when it was approaching or leaving the area below the antenna.

### Lightning Arresters

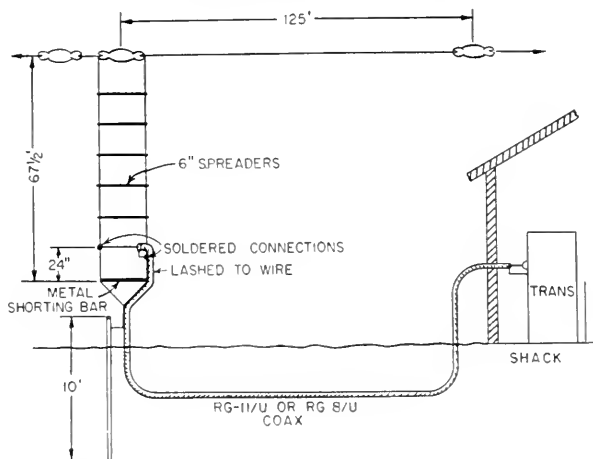
What steps should we take to protect ourselves and our equipment against these hazards? You will observe that the Electrical Code specifies that the lead-in may be a coaxial cable, the shield of which is permanently and effectively grounded. This means that a ground connection, using No. 4 wire or larger, should be made to the shield of the coaxial cable at the point where it is nearest to the ground outside of the house. If the cable can be run underground, a grounding

stake should be located at the point where the cable enters the ground. The grounding stake, to be effective in soils of average conductivity, should be not less than 10 feet long, and if possible, plated with a metal which will not corrode in the local soil.

When open-wire feeders are used, a lightning arrester is required. The type of lightning arresters provided for residential broadcast and television antennas may be suitable for very

twelve years these gaps were in use there was never an occasion when a lightning hit came closer to our house than a half block when a neighbor's house was struck. This could have been a happenstance but it is the fact, nevertheless. In the Pennsylvania Dutch country around Lancaster and York, most barns nowadays are protected from lightning by a length of old trolley wire mounted on poles extending about 10 feet above the roof. Both ends of the wire

Fig. 2 — Sketch of coax-fed grounded Zepp antenna. Adjustment is discussed in the text.



low-power installations but where higher power is used, they are inadequate, since the radio-frequency voltage on the transmission line is usually enough to cause them to operate; i.e., flash over.

During the early Thirties, advice was obtained from the Naval Research Laboratory at Washington, D. C., on a suitable grounding arrangement for lightning protection for a 1-kw. installation. It was their suggestion that a spark gap be provided between each of the two open-wire feeders and a center contact, grounded with No. 4 or larger wire. It was recommended that  $\frac{1}{8} \times \frac{1}{2}$ -inch flat brass rod shaped as shown in Fig. 1 be used for the gaps. Each of the gaps should be set sufficiently far apart so as to prevent flash-over during normal operation of the transmitter. It was found that because of the standing waves on the open-wire line a gap of approximately  $\frac{3}{16}$  inch was necessary.

This device worked very well during thunderstorms as it would start sparking intermittently when a storm was approaching. As the storms passed over the immediate area, the frequency of discharge would increase. During heavy thunderstorms, there was a steady stream of sparks at the gaps. It was possible to operate the transmitter with relatively little effect on its performance even while the static charges were jumping across the equipment, but this was seldom done because of a personal reluctance to be so close to the antenna system. It has been my belief that a properly installed spark gap on an antenna system drains off sufficient static from the immediate area to prevent a direct hit. This view stems from that fact that during the

are grounded and, so far as can be learned, no barn so protected has suffered lightning damage.

#### Direct Ground Connection

Many of our modern antennas permit relatively simple methods of direct ground connection, which do not interfere with the operation of the antenna. Rotary beams using a T or gamma match may have the center of each of the elements, including directors and reflectors, grounded to the tower on which they are mounted. Two- and six-meter beams should have the supporting pole grounded. If the antenna is mounted on a wooden pole or on the top of a house, a No. 4 or larger wire should be extended from the beam to the ground, using insulators where the wire comes close to the building. The ground wire should be spaced away from metal objects such as gutters, etc., or should be solidly grounded to them. If the connection to such objects is not a good one, but is variable in resistance, it may be a source of spurious signals when excited by the transmitter. This often results in interference with your own or your neighbors' broadcast or television reception.

For the past seven years, the antenna shown in Fig. 2 has been used at W4ZG, Winston-Salem, N. C. It gives what appears to be good lightning protection. It hasn't been hit yet. And best of all, signal reports have been more than satisfactory on power comparisons made with other stations under like conditions.

The antenna may properly be called an end-fed Zepp. Since much of the work done here is on the Tar Heel Net frequency of 3865 kc., the

(Continued on page 124)

# Happenings of the Month

## ENGWICHT NEW DIRECTOR

Because of a change of employment, Ray H. Cornell, W6JZ, recently became ineligible to continue as a director of the League from the Pacific Division. In accordance with Article 8 of the Articles of Association, the Vice-Director, **Harry M. Engwicht, W6HC**, was thereupon proclaimed director for the remainder of the term expiring at the end of this year. As notice of the change was too late to permit Mr. Engwicht to attend the meeting of the Board of Directors in Hartford May 13th-14th, Mr. Cornell represented the views of the Pacific Division, although necessarily without vote. In its review of the matter, the Board of Directors set March 14, 1955, the date of change of employment, as the effective date of Director Engwicht's office.

## 7-MC. NOVICE SEGMENT EXPANDED

Three years ago when the Federal Communications Commission proposed a new 7-Mc. band segment of 7175-7200 kc. for Novice use, the League's Board of Directors heartily endorsed the idea but urged that the segment be 50 kc. in width. FCC ruled against the larger band, at the time, suggesting that operating experience with the smaller assignment should be acquired first. At its 1954 meeting the Board found itself precisely of the same opinion as earlier, and voted to recommend an expansion to 7150-7200 kc.; the Commission has now concluded rule-making proceedings in the matter and effective June 22nd amended our rules to authorize the full 50 kc. for Novice use.

## R.E.T.M.A. AMATEUR COURSE

Through its Amateur Radio Activities Section, the Radio-Electronics-Television Manufacturers Association has produced a text-and-records course in theory and code instruction aimed at the Novice Class amateur license. The primary interest of the industry association lies neither in the sale of this item, since it is non-profit, nor in sales of amateur equipment, but rather in urging that more people take up amateur radio as a steppingstone to a career — the objective being to make additional trained personnel available to meet the needs of the expanding electronics field. RETMA suggests that its course will have particular interest for civil defense training programs, amateur radio clubs, hobby groups, schools and personnel in all branches of the military service.

The course consists of an illustrated text on basic theory, equipment operation, etc.; an ARRL *License Manual*; and five LP records of code instruction. Its price is approximately

\$10; the course may be secured from RETMA, 777 14th St., N.W., Washington 5, D. C. A brochure describing the course is available free of charge upon request.

## "LMS" 25TH

The transcribing initials which, in the past, appeared on countless thousands of letters and bulletins from Hq., far more often than any other, are LMS — which as practically every ham in Christendom knows stands for Lillian M. Salter, currently Administrative Aide in the ARRL Communications Department. On May 12th, "Lil" marked 25 years on the staff —



WIZJE

being the seventh Hq. member to attain that length of service.

Miss Salter probably knows more about the day-to-day operation of the CD than anyone else. She is the link between policy and practical accomplishment. Employed originally as a stenographer, she soon acquired administrative duties: processing and editing section reports, supervision of SCM appointments and appointee records, field-organization supplies, club affiliations and records, to name a few. She still personally handles the master stencils for the numerous CD bulletins to appointees and clubs. During World War II, with the title of Assistant Communications Manager, she provided an important continuity in the department through a succession of acting communications managers in Mr. Handy's absence on military duty.

Lil Salter managed for over twenty years to keep from becoming a ham, but a surge of enthusiasm for the Novice license a couple of years ago caught her, too; she quickly graduated to General Class, and is now W1ZJE. Don't look for her on the air around the middle of each month, however; it's "copy time" for QST section reports, and evening hamming must be foregone for overtime work in their editing and processing. That is typical of LMS — as loyal and as conscientious and as devoted a worker for amateur radio and the League as has ever graced the Hq. staff.

## LICENSE PLATE ACTIVITY

Amateurs in several states have been actively promoting the issuance of call-letter license plates, and the governors of four states and the Territory of Hawaii have recently signed into law the coveted legislation. Thirty-one states now offer this privilege and Headquarters continues to provide information on the subject to individuals or clubs.

In Utah, W7NVY was appointed to head the committee which saw its efforts to a successful conclusion on March 11th, when the Governor put his name to the bill. Maryland amateurs W3EQK and W3PRL were instrumental in their state in having Governor McKeldin sign into law, on April 25th, a bill which authorizes plates for mobile amateurs. Meanwhile, in Pennsylvania, W3s BN QV YA ADF EOZ RSB TBV and VZJ organized a drive that put them over the top on May 3rd when Governor Leader made HB 561 into law. Hawaii joined with the Canal Zone and Alaska on May 5th when the Governor signed Act 67. Sparked by W9EU, W9BHT, W9PVD, and W9UQT, in Illinois, Governor Stratton signed the new law on May 11th; it took three years to get this act through, and a committee of more than thirty coordinated the complete coverage that spelled success in their state. On May 26th Connecticut became the latest State to join the parade when Governor Ribicoff signed SB 23 into law.

## EXAMINATION SCHEDULE

The Federal Communications Commission will give Extra and General Class amateur examinations during the second half of 1955 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. *Even stated dates are tentative and should be verified from the Engineer as the date approaches.* No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted. (Novice, Technician and Conditional exams are given only by mail. See page 50, May 1954 QST, or the *License Manual* for details.)

Albuquerque, N. M.: October 1.  
Amarillo, Texas: September 13.  
Anchorage, Alaska, 53 U. S. Post Office Bldg.: By appointment.  
Atlanta, Georgia, 718 Atlanta National Building, 50 Whitehall St. S. W.: Tuesday and Friday at 8:30 A.M.  
Baltimore 2, Md., 500 McCawley Bldg.: Monday through Friday. When code test required, between 8:30 A.M. and 9:30 A.M.  
Beaumont, Texas, 329 P. O. Bldg.: Monday through Friday except Thursday only when code test required.  
Birmingham, Ala.: September 7, December 7.  
Boise, Idaho: Sometime in October.  
Boston, Mass., 1600 Customhouse: Wednesday through Friday 9:00 A.M. to 10 A.M.  
Buffalo, N. Y., 328 P. O. Bldg.: Thursday.  
Butte, Mont.: Sometime in September.  
Charleston, W. Va.: Sometime in September and December.  
Chicago, Ill., 826 U. S. Courthouse: Friday.  
Cincinnati, Ohio: Sometime in August and November.  
Cleveland, Ohio: Sometime in September and December.



Oswald G. Villard, jr., W6QYT, was chosen by the Merit Award Committee to receive the ARRL Award for 1954. Presentation was made at the Pacific Division Convention by Director Harry M. Engwicht (center), W6HIC; Convention Chairman W6UJU is at left. The plaque states the basis of the award is "for the advancement of the welfare of amateur radio through outstanding technical contributions in the fields of wave propagation, single-sideband telephony, and selective circuits." Better known as "Mike," W6QYT is an associate professor at Stanford University, trustee of W6YX, and well-known QST author. (Photo courtesy W6WME)

Columbus, Ohio: Sometime in July and October.  
Corpus Christi, Texas: September 8, December 8.  
Dallas, Texas, 500 U. S. Terminal Annex Bldg.: Monday through Friday, except Tuesday only when code test required.  
Davenport, Iowa: Sometime in July and October.  
Denver, Colo., 521 New Customhouse: 1st and 2nd Thursdays, 8 A.M.  
Des Moines, Iowa: Sometime in July and October.  
Detroit, Mich., 1029 Federal Bldg.: Wednesday and Friday.  
Fort Wayne, Ind.: Sometime in August and November.  
Fresno, Calif.: September 16, December 16.  
Grand Rapids, Mich.: Sometime in July and October.  
Hartford, Conn.: September 13.  
Hilo, T. H.: October 4.  
Honolulu, T. H., 502 Federal Bldg.: Monday through Friday.  
Houston, Texas, 324 U. S. Appraisers Bldg.: Tuesday and Friday.  
Indianapolis, Ind.: Sometime in August and November.  
Jackson, Miss.: September 7, December 7.  
Jacksonville, Fla.: October 15.  
Jamestown, N. D., October 12.  
Juneau, Alaska, 7 Shattuck Bldg.: By appointment.  
Kansas City, Mo., 3100 Federal Office Bldg.: Friday.  
Knoxville, Tenn.: September 21, December 21.  
Lihue, T. H.: October 12.  
Little Rock, Ark.: July 13, October 5.  
Los Angeles, 539 U. S. Post Office and Courthouse: Wednesday, 9 A.M. and 1 P.M.  
Louisville, Kentucky: Sometime in November.  
Memphis, Tenn.: July 15, October 6.  
Miami, Fla., 312 Federal Bldg.: Thursday.  
Milwaukee, Wisconsin: Sometime in July and October.  
Mobile, Ala., 419 U. S. Courthouse and Customhouse: Wednesday and by appointment.  
Nashville, Tenn.: August 5, November 3.  
New Orleans, La., 400 Audubon Bldg.: Monday through Friday except Monday through Wednesday only at 8:30 A.M. when code test required.  
New York, N. Y., 748 Federal Bldg., 641 Washington St.: Monday through Friday.  
Norfolk, Va., 402 Federal Bldg.: Monday through Friday except Friday only when code test required.  
Oklahoma City, Okla.: July 12, October 11.  
Omaha, Nebr.: Sometime in July and October.  
Philadelphia, Pa., 1005 U. S. Customhouse: Monday through Friday, 8:30 A.M. to 2 P.M.



Phoenix, Ariz.: Sometime in July and October.  
 Pittsburgh, Pa.: Sometime in August and November.  
 Portland, Maine: October 11.  
 Portland, Ore., 433 U. S. Courthouse: Friday, 8:30 A.M. for  
 20- and 13-w.p.m. code tests.  
 Roanoke, Va.: October 1.  
 St. Louis, Mo.: Sometime in August and November.  
 St. Paul, Minn., 208 Federal Courts Bldg.: Friday, 8:45  
 A.M.  
 Salt Lake City, Utah: September 16, December 16.  
 San Antonio, Texas: August 11, November 3.  
 San Diego, Calif., 15-C U. S. Customhouse: By appoint-  
 ment.  
 San Francisco, Calif., 323-A Customhouse: Friday.  
 San Juan, P. R., 323 Federal Bldg.: Thursday, and Mon-  
 day through Friday at 8 A.M. if no code test required.  
 Savannah, Ga., 214 P. O. Bldg.: By appointment.  
 Schenectady, N. Y.: September 14-15, December 7-8,  
 9 A.M. and 1 P.M.  
 Seattle, Wash., 802 Federal Office Bldg.: Friday.  
 Sioux Falls, S. D.: September 14, December 14, 10 A.M.  
 Spokane, Wash.: Sometime in September.  
 Syracuse, N. Y.: Sometime in July and October.  
 Tallahassee, Fla.: July 23.  
 Tampa, Fla., 410 P. O. Bldg.: By appointment.  
 Tulsa, Okla.: July 14, October 13.  
 Tucson, Ariz.: Sometime in October.  
 Wailuku, T. H.: October 7.  
 Washington, D. C., 415 22nd St., N. W.: Monday through  
 Friday, 8:30 A.M. to 5 P.M.  
 Wichita, Kansas: Sometime in September.  
 Williamsport, Penna.: Sometime in September and Decem-  
 ber.  
 Wilmington, N. C.: December 3.  
 Winston-Salem, N. C.: August 6, November 5

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**MINUTES OF 1955 SPECIAL MEETING OF THE  
 BOARD OF DIRECTORS  
 AMERICAN RADIO RELAY LEAGUE  
 May 13-14, 1955**

1) Pursuant to due notice, the Board of Directors of The American Radio Relay League, Inc., met in special session at the Statler Hotel, Hartford, Connecticut, on May 13, 1955. The meeting was called to order at 9:37 A.M. EDT, with President Goodwin L. Dosland in the Chair and the following directors present:

P. Lanier Anderson, Jr., Roanoke Division  
 James P. Born, Jr., Southeastern Division  
 John H. Brabb, Great Lakes Division  
 George V. Cooke, Jr., Hudson Division  
 Robert E. Cowan, West Gulf Division  
 Gilbert L. Crossley, Atlantic Division  
 Alfred M. Gowan, Dakota Division  
 Walter R. Joos, Southwestern Division  
 Claude M. Maer, Jr., Rocky Mountain Division  
 Harry M. Matthews, Central Division  
 Philip S. Rand, New England Division  
 Alex Reid, Canadian Division  
 R. Rex Roberts, Northwestern Division  
 William J. Schmidt, Midwest Division  
 George H. Steed, Delta Division

Absent: Director Harry M. Engwicht, Pacific Division. Also in attendance as members of the Board, without vote, were Wayland M. Groves, First Vice President; F. E. Handy, Vice President; Percy C. Noble, Vice President; A. L. Budlong, General Manager. Also in attendance, at

the invitation of the Board as non-participating observers, were New England Division Vice-Director Clayton C. Gordon and Central Division Vice-Director George E. Keith. There were also present Treasurer David H. Houghton, Technical Director George Grammer, Assistant Secretary John Huntoon, and Quayle B. Smith of the General Counsel's office.

2) On request of the President, Vice President Groves assumed the Chair. Whereupon, on motion of Mr. Dosland, the following resolution was unanimously ADOPTED, by rising vote (applause):

WHEREAS, on January 1, 1955, Alex Reid, VE2BE, completed 25 years of continuous service as a member of the Board of Directors of The American Radio Relay League, Inc., representing the League members in Canada, and

WHEREAS, his fellow directors on the Board are mindful of the benefits which have accrued to the Board as the result of his long experience and wise counsel, and WHEREAS, it is their desire to make known to Alex Reid their deep affection for him as a respected associate and beloved fellow-amateur, and

WHEREAS, the Board wishes to express to him its sincere best wishes for his continued success and happiness for many years to come

Now, therefore, BE IT RESOLVED, that the Board of Directors, meeting in Hartford, Connecticut, on May 13, 1955, in recognition of Alex Reid's untiring efforts on behalf of the League, does hereby express to him its congratulations and deep appreciation of his quarter century of loyal and intelligent devotion to the best interests of amateur radio and the League.

Whereupon, Mr. Dosland resumed the Chair. Mr. Reid spoke briefly in appreciation.

3) Moved, by Mr. Born, that the Board invites Ray H. Cornell, of the Pacific Division, to attend this meeting as an observer, with the right to participate in discussions, but without the right to vote; and further that the Board authorizes reimbursement of the expenses incidental to his attendance. Moved, by Mr. Maer, to amend the motion to add "and that the Board ratifies the action of the officers of the League in this matter." Moved, by Mr. Brabb, further to amend the motion to add the words "and that all Board members are instructed to review the matter of their eligibility to serve and to resign should they find themselves ineligible by reason of their employment"; but, after discussion, Mr. Brabb withdrew the motion to amend. The question then being on the original amendment, the same was unanimously ADOPTED. (At this point, Atlantic Division Vice Director Charles O. Badgett, General Counsel Paul M. Segal, and Ray H. Cornell, of the Pacific Division, entered the meeting.) Unanimous consent being given, Mr. Cornell discussed the circumstances resulting in his vacating the office of director for the Pacific Division. After further extended discussion, during which the Board heard from its General Counsel, on motion of Mr. Brabb, unanimously VOTED to amend the motion by striking the text of the previous amendment and substituting therefor the following: "And that this Board finds that the Pacific Division Director, by entering in the employ of a firm engaged in the manufacture, sale or rental of radio apparatus on March 14, 1955, thereby effected his resignation as a director on that date." The question then being on the motion as amended, the same was unanimously ADOPTED.

4) On motion of Mr. Roberts, unanimously VOTED that the minutes of the 1954 special meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

5) On motion of Mr. Born, unanimously VOTED that the minutes of the 1955 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

6) On motion of Mr. Gowan, unanimously VOTED that the annual reports of the officers to the Board of Directors are accepted and the same placed on file.

7) Mr. Roberts presented the report of the Finance Committee; Mr. Brabb presented the report of the Planning Committee; Mr. Cooke reported briefly for the Membership & Publications Committee; Mr. Dosland reported briefly for the Public Relations Committee; Mr. Reid presented the report of the Merit Award Committee. Whereupon, without objection, ORDERED that these reports be received and placed on file. Without objection, ORDERED that the report of the Committee for the Handicapped be deferred for consideration later in the meeting.

**ARE YOU LICENSED?**

• When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.

8) On motion of Mr. Crossley, unanimously VOTED that the annual reports of the directors to the Board of Directors are accepted and the same placed on file.

9) At this point, supplementary oral reports were rendered by the officers of the League.

10) The Board was in recess from 11:48 A.M. until 11:51 A.M.

11) Moved, by Mr. Brabb, that the Executive Committee, together with the General Counsel, comprise a standing committee for the purpose of determining eligibility of nominees for elective offices and that all rulings of eligibility shall be concurred in by such standing committee; but, unanimous consent being given, Mr. Brabb withdrew the motion.

12) Moved, by Mr. Brabb, that the General Manager investigate the possibility and practicability of publishing a small handbook on the construction and use of test instruments. Moved, by Mr. Rand, that the motion be amended by striking the text and substituting thereof the following: "That the Board express approval of the present policy of the General Manager in the publication of additional books such as 'Single Sideband for the Radio Amateur' and the proposed mobile booklet, and that he continue to explore this field;" but, RULED, by the Chair, that the motion to amend was out of order as not being germane. Whereupon, the question being on the original motion, the same was unanimously ADOPTED.

13) Moved, by Mr. Brabb, that the Technical Department be instructed to investigate and report to the General Manager the feasibility of increasing the scope of the Novice examination in order to insure such licensee's ability to adjust and operate his radio equipment in accordance with current regulations. Moved, by Mr. Cooke, to amend the motion to include a study of the possibility of adding questions on television interference; but there was no second, so the motion to amend was lost. Whereupon, the question being on the original motion, the same was unanimously ADOPTED.

14) Moved, by Mr. Cooke, that there be established a new League official appointment to be called Public Relations Manager, or PRM, to enable the League to draw upon professional public relations and publicity talent within the radio amateur ranks in order that the League and amateur radio generally be more effectively represented to the public. This appointment to be made by Section Communications Managers, but only within rigid requirements

which will insure that PRM appointees have at least one year of professional experience in publicity, public relations or newspaper editorial work, appointed for Section, county and local jurisdiction in similar manner to present EC appointments. The PRM duties shall be to cultivate good amateur relations with the public through publicity and cooperative efforts with other groups, act as a local "Amateur Radio Information Bureau," serve as local outlets for public statements giving local angles to press releases at Headquarters and for public statements aimed at furthering League policies, and that this post be left open by SCMs rather than unqualified personnel be appointed. On motion of Mr. Maer, unanimously VOTED to amend the motion to provide that the Communications Manager is requested to initiate a study of the establishment of such an appointment and report the results of his study at the next meeting of the Board. Whereupon, the question being on the motion as amended, the same was unanimously ADOPTED.

15) The Board was in recess for lunch from 12:28 P.M. until 2:07 P.M.

16) Moved, by Mr. Cooke, that the General Manager be instructed to petition the FCC to revise Part 12.107 (c) and (d) of the Rules Governing Amateur Radio Service, titled "Special Provisions Regarding Radio Teleprinter Transmissions," to permit any shift under 900 cycles while still permitting standard intercommunication with 850 cycle shift as at present incorporated in the Rules. On motion of Mr. Crossley, VOTED to amend the motion by stating that the General Manager is instructed to investigate the feasibility of acting in this manner and, if found feasible, to so petition the Commission to amend. The question then being on the motion as amended, the same was unanimously ADOPTED.

17) On motion of Mr. Rand, unanimously VOTED that the Board congratulates the Headquarters staff for a job well done during the past year.

18) On motion of Mr. Rand, the following resolution was unanimously ADOPTED:

WHEREAS, on March 6, 1955, C. Vernon Chambers completed 25 years of continuous service to The American Radio Relay League as Technical Assistant, QST,

BE IT RESOLVED, that the Board of Directors, meeting in Hartford, Connecticut, on May 13, 1955, in recognition of C. Vernon Chambers' untiring efforts on behalf of the League, does hereby express its deep ap-

The ARRL Board of Directors and League officials at a luncheon recess during the meeting in Hartford on May 13th. Seated, l. to r.: Southwestern Director Joos; Ray H. Cornell, W6JZ, of the Pacific Division; First Vice-President Groves; Northwestern Director Roberts; Midwest Director Schmidt; Vice-President and Communications Manager Handy; Counsel Quayle B. Smith; President Dosland; Secretary and General Manager Budlong; Asst. Secretary Huntoon; Treasurer Houghton; Canadian Director Reid; Vice-President Noble; New England Director Rand; Rocky Mountain Director Maer. Standing, l. to r.: West Gulf Director Cowan; Technical Director Grammer; New England Vice-Director Gordon; Great Lakes Director Brabb; Southeastern Director Born; Dakota Director Gowan; Roanoke Director Anderson; Central Director Matthews; Central Vice-Director Keith; Hudson Director Cooke; Atlantic Vice-Director Badgett; Atlantic Director Crossley. Absent from photo: Delta Director Steed, General Counsel Segal.



preciation of his loyalty, fidelity, and intelligent devotion to the best interests of amateur radio.

19) Moved, by Mr. Rand, that the Board review Items 10, 14, 17, 19, 24, 27, 29, 33, 34, 50, 69, 71, 82, 86 of the minutes of the 1954 Special Meeting of May 14 & 15th to determine whether or not the instructions therein contained were carried out; but, with the consent of his second, Mr. Rand withdrew the motion. Whereupon, the General Manager, in a supplementary report to his earlier oral report, reviewed the action taken with respect to the listed items.

20) Moved, by Mr. Rand, that the Board direct the Editor of *QST* to publish the results of the New England Director's questionnaire in an early issue of *QST*; but there was no second, so the motion was lost.

21) Moved, by Mr. Rand, that the Board instruct the General Manager to use his every effort to have the RACES program made a permanent, instead of a temporary, agency; but there was no second, so the motion was lost.

22) Moved, by Mr. Rand, that the Board instruct the Editor of *QST* to place the primary emphasis on RACES and only secondary emphasis on AREC and to provide ample space each month in *QST* for publishing material on RACES. On motion of Mr. Maer, unanimously VOTED to amend the motion by striking the text and substituting therefor that the Board instruct the Editor of *QST* to continue to emphasize RACES and AREC and to provide ample space in *QST* for publishing material on these activities and to continue efforts to stimulate these activities. Whereupon, the question being on the motion as amended, the same was rejected.

23) Moved, by Mr. Rand, that the Board take immediate and definite steps to raise the overall quality of operating procedures and equipment used on the amateur bands by the following means:

- A. Establish an up-to-date code of ethics for operators.
- B. Establish a minimum set of specs for Ham equipment.
- C. Give all out publicity through *QST*.
- D. Establish a new "Honor Society" for those meeting requirements.
- E. Publish Official Observers reports on bad operating and bad signals in *QST*.
- F. Feature articles in *QST* on both phone and c.w. equipment which will help insure clean signals.
- G. Conduct a contest each year which will feature operators and stations adhering to the new code.
- H. Appropriate sufficient funds to finance this program.

Moved, by Mr. Roberts, to amend the motion to provide that the Planning Committee shall study the matter; but the motion to amend was rejected. The question then being on the original motion, the same was unanimously rejected.

24) Moved, by Mr. Rand, that the Board direct the Planning Committee to study a method of promoting diversification of operating and use of bands by establishing an annual award for the "Typical Ham" of the year in each Division. This award to be suitable loving cup or trophy; but there was no second, so the motion was lost.

25) Moved, by Mr. Rand, that the General Manager be instructed to modify the publication of the ARRL Radio Amateur's Handbook so that the "how to build it" equipment section will be all new every two years, instead of the present every three years; but there was no second, so the motion was lost.

26) Moved, by Mr. Anderson, that the General Manager investigate the establishment of appropriate awards for mobile operation — both as to physical size and merit requirements. Moved, by Mr. Brabb, to amend the motion so that the Merit Award Committee would investigate the establishment of such an award; but there was no second, so the motion to amend was lost. The question then being on the original motion, the same was rejected.

27) On motion of Mr. Anderson, VOTED, that it be the policy of the Board that each director of the League shall send to all other directors a copy of all bulletins, news letters, questionnaires, etc. he originates in his own division.

28) The Board was in recess from 4:00 P.M. until 4:13 P.M.

29) On motion of Mr. Crossley (on behalf of Mr. Cornell), unanimously VOTED that the Board instruct the Secretary in the name of ARRL to continue to seek a change in the Rules Governing Amateur Service, Part 12, Section 12.111 (5) (k) as it pertains to 420-450 Mc. operation, so that the power limit be removed.

30) Moved, by Mr. Born (on behalf of Mr. Cornell), that the Planning Committee be instructed to work out a practical solution to the matter of mobile log keeping and that it be abolished, or kept to a minimum. It is suggested that as a basis of consideration, that if log keeping by mobile stations cannot be abolished entirely that a "Trip Sheet" log be kept, recording time of starting and ending a trip — route covered, frequency and mode of operation. But the motion was rejected, 4 votes in favor to 7 opposed.

31) Moved, by Mr. Joos (on behalf of Mr. Cornell), that to implement and modernize the DX Section of the ARRL, an unpaid committee be set up, whose recommendations, arrived at by joint agreement of a committee two thirds majority, be carefully considered by the ARRL in its DX policies, particularly as to the following: a) DX contest rules; b) DX country list; c) DX awards. This committee to consist of one member from each of the ten highest scoring clubs in the official ARRL DX contest tabulations annually, club committee membership to begin each year on January first following the publication of the official club scores in *QST*, plus any other important DX group or individual deemed helpful by the ARRL. No committee membership to be longer than one year unless the same club is qualified in each succeeding year by its official score remaining among the top ten. Representative member to be selected by each club from among its members. All communication between the committee members and between the committee and the ARRL to be by means of correspondence. Nothing in this proposal shall preclude any individual or club from making proposals either to the ARRL direct or to the committee for approval if considered of merit. Moved, by Mr. Brabb, that the Board now constitute itself a Committee of the Whole for the purpose of considering this matter; but there was no second, so the motion was lost. On motion of Mr. Brabb, unanimously VOTED that the matter is laid on the table.

32) On motion of Mr. Maer, after extended discussion, unanimously VOTED that the salary of the General Manager is increased, effective this date, to \$18,000 per annum. (Mr. Maer requested that the minutes show that all Headquarters personnel in attendance, some of whom are members of the Board, requested leave to absent themselves from the meeting during the discussion of salaries and so absented themselves.) During the absence of Secretary Budlong, in the discussion of this matter, the Chair appointed Quayle B. Smith to record the proceedings of the meeting.

33) Moved, by Mr. Joos, that the General Manager investigate the feasibility of a questionnaire similar to that recently sent out by the New England Division Director to all League members for information purposes; but the motion was rejected.

34) Moved, by Mr. Joos, that the Board instruct the General Manager to print in *QST* quarterly a simple earnings and balance sheet; but there was no second, so the motion was lost.

35) Moved, by Mr. Crossley, that the League, through its General Manager, request the Federal Communications Commission to make a restriction in the 2-meter band (144-148 Mc.). That c.w. operation be restricted to the lowest 100 kc. of the band. But there was no second, so the motion was lost.

36) Moved, by Mr. Crossley, that the Secretary hereafter shall give informal notice to the directors that, on (date) the official notice for the special meeting of the Board will be made. That, if there are any matters which relate to the Articles of Association, notice of these changes must be filed with the Secretary, in his office at West Hartford before that time to be legally included in the Call for the Special Meeting. But there was no second, so the motion was lost.

37) The Board was in recess for dinner from 6:16 P.M. until 8:47 P.M.

38) Moved, by Mr. Crossley, that the Board instruct the General Manager of ARRL to write, edit, and publish a Novice Technical Handbook or Manual, which shall include the fundamentals of electricity and radio, as applied to the level of technical knowledge of the Novice amateur so that he may advance to be better able to read and understand the higher level Handbook; but, after discussion, the motion was rejected.

39) Moved, by Mr. Crossley, that the Board establish a "Student Grade" of ARRL membership much like the similar grade established by the Engineering Societies.

This membership to be available to high school students and others who at the time of application for membership shall not have reached their nineteenth birthday. This membership shall be limited to not longer than three years and the applicant must be a licensed amateur of Novice grade or higher. This grade of membership shall be at the rate of \$2.00 per year, and cannot be used in connection with the family or affiliated club rates. Eligibility to the full membership, of course, is not to be denied, if eligible, but while a Student Grade the member shall have no voting

## BOARD THANKS VOLUNTEER A.R.R.L. OFFICIALS

In reviewing the work of the League for the past year the ARRL Board of Directors again found that much of our progress is due to the volunteer efforts of elected and appointed officials in the administrative and field organization of our association. By unanimous action the Board has again expressed its sincere thanks to the Vice-Directors, director assistants, SCMs, SECs and QSL Managers — an action which we know all amateurs will heartily endorse.

rights in ARRL or Affiliated Clubs. But there was no second, so the motion was lost.

40) On motion of Mr. Groves, the following resolution was unanimously ADOPTED by rising vote (applause):

WHEREAS, on August 26, 1954, George Grammer completed 25 years of continuous service to The American Radio Relay League as Technical Director and Technical Editor of QST,

BE IT RESOLVED, that the Board of Directors, meeting in Hartford, Connecticut, on May 13, 1955, in recognition of George Grammer's untiring efforts on behalf of the League, does hereby express its deep appreciation of his loyalty, fidelity, and intelligent devotion to the best interests of amateur radio.

41) On motion of Mr. Roberts, unanimously VOTED that the General Manager is hereby authorized to reimburse the division directors for actual expenses incurred by them during the year 1955 in the proper administration of ARRL affairs in their respective divisions up to amounts as follows:

Canadian Division Director.....	\$ 550
Atlantic Division Director.....	1250
Central Division Director.....	1000
Dakota Division Director.....	700
Delta Division Director.....	900
Great Lakes Division Director.....	800
Hudson Division Director.....	900
Midwest Division Director.....	900
New England Division Director.....	1000
Northwestern Division Director.....	1000
Pacific Division Director.....	1200
Roanoke Division Director.....	600
Rocky Mountain Division Director.....	700
Southeastern Division Director.....	1200
Southwestern Division Director.....	1200
West Gulf Division Director.....	1000

42) On motion of Mr. Schmidt, unanimously VOTED that the General Manager is hereby authorized to pay expenses for the operation of ARRL committees during the year 1955, but not to exceed amounts as follows:

Planning Committee.....	\$2000
Finance Committee.....	1500
Merit Award Committee.....	250

43) On motion of Mr. Gowan, unanimously VOTED that the General Manager is hereby authorized to reimburse, in the continental limits of the United States and Canada proper, the Section Communications Managers and QSL Managers of the League, in a total amount not to exceed \$5000 for the year 1955, under the provisions

and conditions set up in paragraph (52) of the minutes of the 1953 Special Meeting of the Board of Directors. For the purpose of defraying incidental costs such as the necessary meals or one night in a hotel, if a meeting is over 50 miles from the SCMs home, or highway tolls involved, for example, reimbursement in excess of mileage may be made in a reasonable amount per SCM organization meeting, this to be approved by the Communications Manager, provided that each miscellaneous expenditure be itemized and submitted with the travel claim.

44) On motion of Mr. Brabb, unanimously VOTED that as part of the 1955 SCM/QSL Manager authorization, the General Manager is also authorized to reimburse the SCMs of Alaska, Canal Zone, Hawaii and the West Indies their actual travel expense for attendance, each within his own Section, at major or considerable group meetings where time is scheduled for promotion of League operating organization at Section level. Hamfests may be included only where sponsor schedules such ARRL Section meeting in advance. Travel allowance for shortest feasible route shall, in addition to actual rail or bus fare, or 7½¢ per mile if SCMs personal transportation is used, be subject to approval by the Communications Manager of a report submitted with the itemized request for reimbursement. This report shall cover attendance, representation of ARRL, meeting discussions, recommendations and progress. When such meeting is over 50 miles from the SCMs address, reasonable incidental costs such as necessary meals, or one night in a hotel not to exceed \$7, for example, may be itemized and also submitted for approval as part of the travel claim. No specific limit is set to the number of trips in the Sections that are reimbursable, but in lieu thereof, an applicable limit of \$150 per annum is hereby established as the maximum that may be reimbursed to each SCM under this authorization.

45) On motion of Mr. Born, unanimously VOTED that to continue the Board's policy of reimbursing Section Emergency Coordinators for certain travel, the General Manager is hereby authorized to pay during the year 1955 a total amount not to exceed \$3500 under the provisions and conditions specified in paragraph (58) of the minutes of the 1952 Special Meeting of the Board of Directors. For the purpose of defraying incidental costs such as necessary meals or one night in a hotel if a meeting is over 50 miles from the SECs home, or highway tolls involved, for example, reimbursement in excess of mileage may be made in a reasonable amount per SEC organization meeting, this to be approved by the Communications Manager, provided that each miscellaneous expenditure must, to be reimbursed, be itemized and submitted with the travel claim. In the case of the SECs of Alaska, Canal Zone, Hawaii and the West Indies, no specific provisions as to the number of trips reimbursed shall apply but reimbursements will otherwise be guided by customary provisions, with the applicable limit of \$150 per annum as a maximum that may be reimbursed to each such SEC under this authorization.

46) On motion of Mr. Crossley, unanimously VOTED that the General Manager is hereby authorized to pay, during the period between January 1, 1956 and the 1956 meeting of the Board, expenses against usual authorizations for administrative and committee operations in no greater amounts than 1955 authorized amounts.

47) On motion of Mr. Roberts, unanimously VOTED that, pursuant to the terms of the Trust Agreement under the Pension Plan, the following persons are appointed to serve as a Pension Committee from June 2, 1955 to June 2, 1956: Arthur L. Budlong, George Grammer, and David H. Houghton.

48) On motion of Mr. Noble, the following resolution was unanimously ADOPTED:

WHEREAS, on May 12, 1955, Lillian M. Salter completed 25 years of continuous service to The American Radio Relay League as Communications Department Administrative Aide,

BE IT RESOLVED, that the Board of Directors, meeting in Hartford, Connecticut on May 13, 1955, in recognition of Lillian M. Salter's untiring efforts on behalf of the League, does hereby express its deep appreciation of her loyalty, fidelity, and intelligent devotion to the best interests of amateur radio.

49) On motion of Mr. Brabb, unanimously VOTED that the Board go on record as commending the Field Engineering and Monitoring Bureau of the Federal Com-

munications Commission for its assistance and cooperation rendered amateurs over the past year.

50) On motion of Mr. Born, unanimously VOTED that the Board hereby expresses its sincere thanks and deep appreciation for the untiring work and devotion of the Vice Directors, director assistants, SCMs, SECs and QSL Managers of the League.

51) Mr. Maer reported for the Committee for the Physically Handicapped; whereupon, without objection, the Chair ordered that the report be received and placed on file.

52) On motion of Mr. Schmidt, affiliation was unanimously GRANTED to the following radio clubs:

Peoria-Area Amateur Radio Club...	Peoria, Illinois
Tri-County Radio Club.....	Dresden, Tenn.
Mansfield Amateur Radio Club...	Mansfield, La.
Kaw-Blue Radio Club.....	Manhattan, Kans.
Fairfield High School Amateur Radio Club.....	Fairfield, Iowa
Luther College Amateur Radio Club.....	Decorah, Iowa
Yampa Valley Radio Club.....	Craig, Colorado
Penn. Central Radio Club.....	Falls Creek, Penna.
Watertown Radio Club.....	Watertown, N. Y.

53) On motion of Mr. Cooke, the following resolution was unanimously ADOPTED:

WHEREAS, the radio amateurs of the United States, its possessions, and Canada are aware of the cooperative actions taken by IARU Societies and their memberships in many international competitions, and

WHEREAS, these same IARU Societies have contributed to the advancement of peaceful international relations by the exchange of amateur radio communications between themselves, the United States, its possessions, and Canada,

BE IT RESOLVED, that the Board of Directors and the Staff of The American Radio Relay League extending their hands in friendly greeting to all IARU Societies, demonstrate their appreciation and faith, created by such operations, in international harmony and the advancement of amateur radio worldwide for the good of all peoples, and

BE IT FURTHER RESOLVED, that the President of the ARRL convey to all IARU Societies a copy of this resolution together with his letter of greeting and appreciation.

54) On motion of Mr. Rand, at 9:54 P.M., the Board recessed under orders to reassemble at 8:30 A.M. on the morrow. The Board reassembled at the same place on May 14, 1955, and was called to order by the Chair at 8:42 A.M. with all directors and other persons hereinbefore mentioned in attendance, except Mr. Engwicht.

55) Moved, by Mr. Rand, that pursuant to Article 7 of the Articles of Association, Percy C. Noble is designated and appointed a member of the Executive Committee. Moved, by Mr. Matthews, to amend the motion to throw the appointment open to election, and to include the name of John H. Brabb as a candidate. Moved, by Mr. Cooke, to further amend the motion to include the name of R. Rex Roberts as a candidate; but Mr. Roberts withdrew his name. The question being on Mr. Matthews' amendment, the same was ADOPTED. The question then being on the motion as amended, the same was unanimously ADOPTED. The Chair appointed Messrs. Rand and Groves as tellers. The tellers announced the result of the first ballot as follows: Mr. Noble, 9; Mr. Brabb, 6. The Chair thereupon declared Mr. Noble designated and appointed as a member of the Executive Committee.

56) Mr. Maer moved the adoption of the following resolution:

BE IT RESOLVED that, pursuant to Article 7 of the Articles of Association, R. Rex Roberts is hereby designated and appointed a member of the Executive Committee, to serve as such for the period ending May 15, 1956, and

BE IT RESOLVED that, pursuant to Article 7 of the Articles of Association, F. E. Handy is hereby designated and appointed a member of the Executive Committee, to serve as such for the period ending May 15, 1956, and

BE IT RESOLVED that, pursuant to Article 7 of the Articles of Association, David H. Houghton is hereby designated and appointed a member of the Executive Committee, to serve as such for the period ending May 15, 1956.

The yeas and nays being ordered, upon request, the ques-

## OFFICERS' REPORTS AVAILABLE TO MEMBERS

Each year the officers of the League make comprehensive written reports to the directors. The Board has made these reports available to interested members, in a volume which also includes reports of the directors. The cost price is 75 cents per copy, postpaid. Address the General Manager at West Hartford, Conn.

tion was decided in the affirmative: Whole number of votes cast, 15; necessary for adoption, 8; yeas, 15; nays, none. So the resolution was ADOPTED.

57) Moved, by Mr. Born (on behalf of Mr. Cornell), that it is the sense of this Board that DX activities within the League receive equal emphasis with other activities of the Communications Department which receive full-time consideration, and that the General Manager be requested to make such administrative changes as may be possible to implement this request; but the motion was rejected, 4 in favor to 11 opposed.

58) Moved, by Mr. Crossley, that the Secretary be instructed to contact the FCC requesting that the T prefix be used with the Technician license, similar to the present Novice. On motion of Mr. Maer, unanimously VOTED to amend the motion to read that the General Manager is requested to make a study of the problem of adding the letter T to the Technician prefix and to report his conclusions to the next Board meeting. The question then being on the motion as amended, the same was unanimously ADOPTED.

59) At this point, the President announced the following committee appointments for the following year:

Finance Committee:

Mr. Roberts, Chairman  
Mr. Anderson  
Mr. Gowan

Planning Committee:

Mr. Brabb, Chairman  
Mr. Born  
Mr. Cooke

Merit Award Committee:

Mr. Reid, Chairman  
Mr. Rand  
Mr. Budlong

60) Moved, by Mr. Rand, that the Secretary read all motions which have been passed by the Board at this meeting; but there was no second, so the motion was lost.

61) On motion of Mr. Maer, the following resolution was unanimously ADOPTED:

RESOLVED, that the Board of Directors hereby compliments the staff of QST for its fine work in producing the 1954 volume of QST and urges the continuation of this high standard.

62) Moved, by Mr. Crossley, that the Board do now resolve itself into a Committee of the Whole to make an informal investigation of the ARRL DX Countries List, used in connection with the DX award, consider the methods used by ARRL and others in selecting those lists and that the results of this meeting be reported back to the Board in meeting with recommendations; but there was no second, so the motion was lost.

63) On motion of Mr. Anderson, the following resolution was unanimously ADOPTED:

WHEREAS, Hugh L. Caveness, W4DW, had for many years served The American Radio Relay League and amateur radio as Director of the Roanoke Division, and

WHEREAS, the institution of amateur radio is deeply grieved by his passing on December 18, 1954

Now, therefore, BE IT RESOLVED, that the Board of Directors of The American Radio Relay League meeting in Hartford, Connecticut on May 14, 1955, on behalf of amateur radio hereby expresses its deep sense of loss at his passing.

(Continued on page 128)

# Hints & Snarls – GVZ Style

BY J. P. JESSUP,\* W2GVZ

**T**HE HANDBOOK has it all wrong. It is chuck full of dope on what to do but there's not a dern word about what *not* to do. For 34 years in ham radio I've needed a book that starts off, "Listen, Stupid, don't ever do it like that." To be a ham you've eventually got to be a plumber, steeplejack, ditchdigger, electrician (not a libel on a respectable profession) and many other things. I can louse up any of those specialties with practically no effort. Let me show you what I mean.

Now take porcelain insulators. They are useful gadgets with a breaking point of one ounce less pressure than I always exert. Wonder if it's tight enough? One more turn and C-R-U-N-C-H. They should have said, "Go easy, you big dope." In ye good ol' days I used to paint panels with a graphite mixture shorting everything; now I put plastic spray on everything, connecting nothing.

I am the kind of guy who can talk to a local with the final turned off and then forget and call DX — minus final — for two hours afterward. It isn't enough to tell me how to wire the switch — you've got to tell me to turn it on!

Oh yes, I really have a penchant for pulling plate caps off 807s when removing the safety caps, even when I accidentally let them cool off first. But my real triumph was a 4-125A. Thinking it was shot anyway, I yanked the safety cap off while it was still hot, thereby pulling off the plate cap and breaking the glass. *Then* I find out it was OK! Charge off twenty-five bucks more to experience.

When I was your age, I used to put the trickle charger on reversed polarity, cooking the storage battery to a smelly crisp. Now I drop hot solder in my shoe while up a ladder. The tattoo on my wrist? That's where I once laid down the soldering iron.

Connecting both sides of a capacitor to the same terminal, putting high voltage on the filament, drilling through a panel and into a hardwood floor — elementary. Only GVZ could get his hands on a blinker socket and wire it into the primary of the high-voltage circuit. You think you've got troubles? One guy topped me, though. He accidentally left his beam turning all night

and couldn't understand the QSB reports he was getting.

The *Handbook* I need (and Brother, so do you) should go something like this:

## Inside Construction Techniques

- 1) Never drop pliers on the 866s. You are apt to bend the pliers or melt them in the resulting arc.
- 2) If you must use a razor blade, wipe the blood off the wire. Corrosion, you know.
- 3) When tacking up 300-ohm line in the attic flatten the thumbtack, not . . . YOW!
- 4) Pick out nonconductors to drop in the rig, you old butterfingers!
- 5) Always wait two months before using any diagrams in radio magazines. That gives the editors time to sneak in the inevitable correction: "Connection 6 should have been made to this gimmick instead of that one."
- 6) Never dislocate a knee by crouching down working on the rig. For the sake of my various insurance records, that one shows up as crouching down to change a tire.
- 7) Never use celluloid coil forms. Maybe you ain't got big enough lungs to blow out the flames in one mighty puff.
- 8) Don't ever sit on the floor for hours stuffing beam elements with rock wool using the XYL's broomstick, only to find out that some big brain invented insulating pellets that you can simply pour in.
- 9) Bounce a tube on the floor with impunity but never toss it six inches onto a featherbed — that's fatal!

## Outside Construction Techniques

- 1) It takes two men to put up a skywire on an icy roof; one to catch the other as he slips over the



edge. Any ol' timer will tell you no antenna will work unless it's erected in temperatures below 15 degrees. It helps to leave hunks of your hide sticking to it.

- 2) If you must stand on a 12-foot ladder and chop through a limb as thick as your thigh to clear the beam, get the heck down pronto when she starts to go (one jump recommended).

- 3) When throwing a rope with rock attached up over a limb, remember Newton's Law of Gravity. This goes, too, for "Ol' Slippery Mitts" on top of the pole with block and tackle while you are trust-



\*337 Hamilton Ave., Glen Rock, N. J.

(Continued on page 128)

# • Technical Correspondence —

## LOW-NOISE RECEIVER DESIGN

1645 Cameron Drive  
Lemon Grove, Calif.

Technical Editor, QST:

In the March issue the article on "Low-Noise Receiver Design" by Longerich and Smith was to me both interesting and profitable, since it enabled me to bring my receiver up to an acceptable level. I have an old HQ-120-X which I bought a couple of years back for \$65. My first attempt at improving the performance involved changing the grid-cap tubes for more modern single-ended types of higher  $\mu_m$ . This resulted in considerable improvement on the lower bands, but in substantially no improvement on the bands above 7 Mc. Believing at the time that the trouble lay in poor image rejection (with an i.f. of 455 kc. and only one r.f. amplifier this is a possibility) and in oscillator pulling, I was in the process of changing over to dual conversion on the three high bands of the receiver (above 5.7 Mc.) with a first i.f. of 5.0 Mc. However, before I had gone very far with this I noticed the above article, and it has done the trick. The cathode follower on the oscillator has eliminated the pulling (if there was actually an appreciable amount present), and the increase in r.f. tank circuit  $Q$  occasioned by the use of the cathode followers has improved the image ratio. This increase in  $Q$ , incidentally, has made the tracking more critical, but not enough so to be a serious problem. But, of course, the major improvement has been in the terrific reduction in receiver self-noise. I now feel that I have a receiver which is equal or superior to anything in the \$300 class.

There were, however, several items in the article which I feel were mistakes, and others which were open to considerable question. One of the items you pointed out, which was that two r.f. amplifiers are not necessarily better than one, since the primary function of the r.f. stage (noise-wise) is to override the noise of the mixer. (Of course, for image-rejection purposes, the more r.f. stages the better, but the law of diminishing returns sets in very rapidly.) In the present instance one r.f. stage is more than ample from the noise consideration, since the equivalent noise resistance of a 6AC7 triode mixer is

$$R_{eq} = 4 \div g_o = 4 \div (g_m \div 4) = 16 \div g_m = 16 \div .011$$

which is about 1450 ohms! (The equations used may be found on page 937 of *Radiotron Designer's Handbook*, 4th ed.) Therefore, the limiting resistance for noise production is the r.f. stage, which has an  $R_{eq} = 2.5 \div g_m = 230$  ohms.

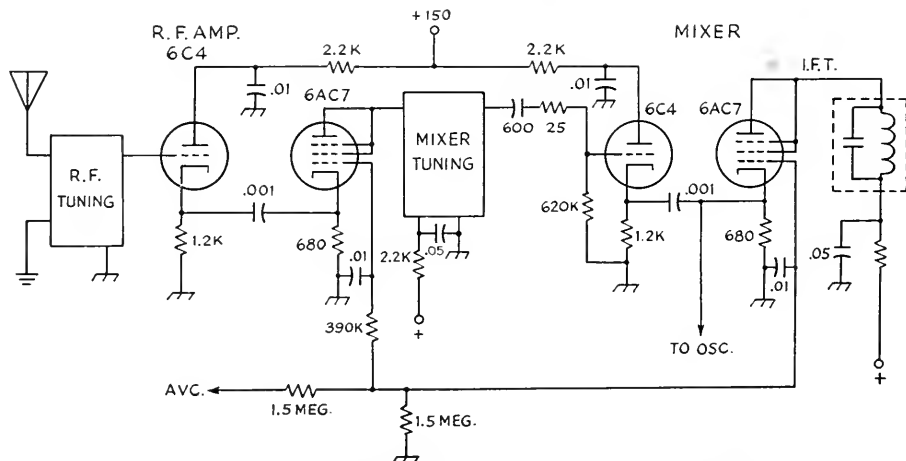
Let me back up a bit and substantiate that "therefore" in the last sentence. Assuming a minimum gain of ten times from the grid of the r.f. stage to the grid of the mixer, the effective resistance of the mixer at the grid of the r.f. stage would be  $1450/10$  or 145 ohms. The gain of the r.f. stage in the original receiver was 10, and if anything, it is greater in the present configuration. This is based on the consideration that the  $\mu$  of a triode-connected 6AC7 is 40, and the  $Q$  of the tank circuit has been increased. Hence, the mixer resistance translated to the r.f. grid would be less than 145 ohms, and the 230 ohms of r.f. tube equivalent resistance at the grid of the r.f. amplifier would be the controlling factor in noise production.

Another error, which is in some ways more obvious, is the application of a.v.c. voltage to the grid of the 2nd r.f. amplifier cathode follower in Fig. 1 of the article. If  $A$  is the gain of the tube in a normal grounded-cathode amplifier application, then the gain of a cathode follower is

$$A' = A \div (1 + A)$$

and since the gain of a 6C4 is about 10 or 12, this fraction would be in the neighborhood of  $12/13$  or about 0.92. If the gain of the tube were reduced to  $\frac{2}{3}$  by a.v.c. action, or to a gain of 4, then the cathode-follower gain would be reduced to  $4/5$  or 0.8. This is not my idea of very good a.v.c. action, since it would result in a reduction of gain of small percentage for a large value of a.v.c. voltage. A more practical method would be to apply the a.v.c. (or even better, partial a.v.c.) to both r.f. and mixer grounded grids, grounding the grids for r.f. through a  $0.01\text{-}\mu\text{f.}$  capacitor. In my receiver, applying no a.v.c. to the r.f. stage or mixer resulted in severe cross-modulation in the presence of strong adjacent signals, particularly on the broadcast bands. This was eliminated completely upon application of  $\frac{1}{2}$  a.v.c. voltage to the r.f. and mixer grids as indicated above.

In addition, the authors quoted a transconductance of 11,000 for the triode-connected 6AC7. However, the tube manual gives this value of  $g_m$  only for a plate voltage of 150 volts and a cathode bias resistor of 160 ohms. Under these conditions the plate current is 12.5 ma., and this results in a bias of  $-2.0$  volts. The 1500-ohm cathode resistor used by the authors in Fig. 1 is certain to result in a smaller effective value of  $g_m$  for the operating conditions, producing a smaller gain, and more important, more noise. I used a cathode resistor of 700 ohms in both 6AC7 stages, and would have used a smaller value if the gain had appeared to be insufficient. There should be no difficulty in obtaining sufficient driving voltage even with a cathode resistor of only

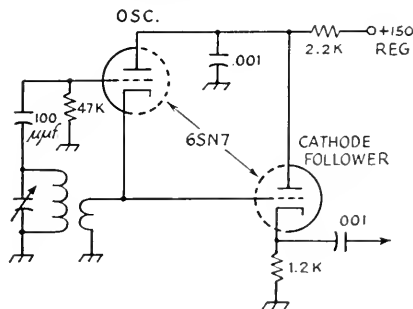


Revised front-end wiring of an HQ-120. The oscillator schematic is shown later.



100 to 200 ohms, because of the low-impedance output of the cathode follower. I have not been able to obtain a set of characteristics for the triode-connected 6AC7, so I have no idea how the variation of plate voltage will affect the picture, but as a general thing, the greater the bias voltage applied, the less the transconductance.

Another small point: In Fig. 1 of the article, it is not necessary to provide the 47- $\mu$ mf. coupling capacitor and the 47K resistor to the grid of the cathode follower on the oscillator stage. The d.c. level at the cathode of the oscillator is not sufficient to affect the operation of the cathode follower, being only a few millivolts; compared to that at the cathode of the cathode follower it is negligible. Furthermore, either the Hartley or the tickler-feed-back oscillators shown in Fig. 2 can be used as a grounded-plate oscillator. The Hartley circuit is so shown in Fig. 2; the tickler circuit need only be changed to look as follows:



This results in a somewhat simpler arrangement than that shown in Fig. 2, and uses about three components less. This is the oscillator circuit as I used it in my receiver. It is to be noted that the polarity of the feed-back coil must be observed — the end previously tied to the plate must go to ground to maintain oscillations. In my opinion this configuration results in a more nearly constant output as frequency is varied, due to the slight degeneration inherent in having a r.f. potential at the cathode. In addition, the signal is not taken from the tank circuit of the oscillator, which improves the isolation somewhat.

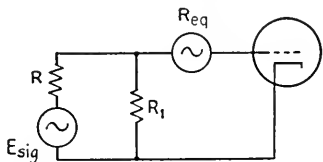
In closing, let me say that in my case the article was very timely and much appreciated. I am enclosing a sketch of the complete front end on my HQ-120 as it now is wired.

— Robert Irving, Lieut., USN

4420 Narragansett Ave.  
San Diego 7, Calif.

Technical Editor, QST:

... Before proceeding with individual points it might be well to examine the equation for the noise figure of the input stage of a system as given by Goldberg ("Some Notes on Noise Figures," *I.R.E. Proceedings*, October, 1948).



Where  $R$  = Generator impedance  
 $R_1$  = Signal generator load  
 Noise from the tube is represented  
 by generator  $R_{eq}$

$$\text{Noise figure } F = \frac{R + R_1}{R_1} + \frac{R_{eq}}{R} \left( \frac{R + R_1}{R_1} \right)^2 \quad (1)$$

The first term on the right side of this equation gives the effect upon the noise figure of a load upon the source of voltage when tube noise is disregarded. Such a load produces noise but no signal; thus, if  $R = R_1$  this term in the equation is 2. The second term shows the effect of the load

upon the source in reducing the voltage in comparison with the noise voltage contributed by  $R_{eq}$ . If  $R = R_1$ , the second term of the equation becomes  $4R_{eq}/R$ .

When  $R_{eq}$  is about the same in value as  $R$  or larger, the second term is, of course, larger than the first term and has a greater influence on  $F$ . Under these conditions, changing from the actual antenna to a dummy may cause a change in  $R$  which could swamp out the effect of any external noise present in the antenna.

Now let us consider the simple test prescribed to determine whether or not the receiver is noisy. If we take the assumption made by the authors that we are operating at a frequency where external noise is very low, there is no reason that substituting a dummy antenna for a real antenna should reduce the noise, since the radiation resistance of the antenna certainly would not have a temperature greater than that of the dummy resistance. If there were actually no external noise, this test could condemn the best receiver that could be built. The fact that very few amateurs have the equipment to measure the impedance of an antenna also makes it very difficult to assess the reason for the change in noise level when the dummy antenna is substituted for the real antenna. As shown above, with a change in impedances between the two it is quite conceivable that the noise level could increase when the resistor is substituted for the antenna.

As mentioned in the article, a low-noise-figure receiver has no advantages in a noisy location, so another simple test can be prescribed to see if the receiver is working down to the local noise level. The receiver should be set to a frequency where there are no signals and the antenna trimmer should be tuned through resonance. If there is an increase in noise as the antenna circuit goes through resonance, the receiver is satisfactory for the location. If no noise peak is noticed then some improvement is called for.

If we are to make some improvement in the receiver it is nice to know where to begin. Now we remove the antenna and swing the antenna trimmer through resonance. If we hear the noise peak there is hope that the necessary changes will not be too drastic. Perhaps in this case a new r.f. amplifier may be the answer. If we hear no change in noise, the next step is to vary the trimmer on the next grid. If a change of noise is heard, there is still hope that the receiver can be improved. If no change of noise is heard in this case, I can only recommend a new receiver or a converter.

Assuming that we have decided that we need a new r.f. amplifier, let us look into the question of what is the best type of amplifier to use. To make our calculations easier, assume that we match the antenna into the receiver, a condition which is necessary if we are to have a flat transmission line feeding the receiver. Because of tracking difficulties most receivers covering wide tuning ranges will not be more closely coupled than a matched condition. This matched condition will give us a noise factor at least 3 db. worse than we would have if we had no loss in the antenna transformer and maintained the same source impedance feeding the tube.

We should now look again at equation (1).

As stated by Goldberg, we should take the sum of the  $R_{eq1} + R_{eq2}$  for the two tubes in a cathode-coupled circuit. For simplicity, let us neglect the two cathode resistors in the circuit, which will further degrade the noise performance of the amplifier, and just assume that if there is a close contest between the cathode-coupled amplifier and one of the others, it would be advisable to select the other one. Although the authors have selected the 6AC7 as a high  $g_m$  tube they have proceeded to bias it until the  $g_m$  is down to about 4000  $\mu$ hos.

In our calculations let us consider two receivers, one with a very good input circuit which, when loaded by the antenna, offers a source impedance  $R$  of 5000 ohms to the r.f. amplifier and the other a relatively poor one which offers a source impedance of 500 ohms to the first tube. We can now look into the noise figures of four different amplifiers: a 6SK7, a 6AG5, the cathode-coupled stage recommended in the article, and a 6BQ7 cascode circuit. The noise resistances for these follow:

6SK7	11,000 ohms
6AG5	1650 ohms
6C4	800 ohms
6AC7 triode with 1500-ohm cathode resistor	600 ohms
6BQ7	500 ohms

Goldberg gives the following formulas for the noise figures:

Grounded cathode:

$$F = \frac{R + R_1}{R_1} + \frac{R_{eq}}{R} \left( \frac{R + R_1}{R_1} \right)^2$$

Cathode coupled:

$$F = \frac{R + R_1}{R_1} + \left( \frac{R_{eq1} + R_{eq2}}{R} \right) \left( \frac{R + R_1}{R_1} \right)^2$$

Inserting numerical values we have:

	$R = R_1 = 10,000$ ohms	$R = R_1 = 1000$ ohms		
	$F$	$N.F.$	$F$	$N.F.$
	(power)	(db.)	(power)	(db.)
6SK7	6.4	8.1	46	16.6
6AG5	2.66	4.25	8.6	9.35
6C4-6AC7				
cathode-				
coupled	2.56	4.10	7.6	8.8
6BQ7				
cascode	2.2	3.4	4.0	6.0

From these figures it can be seen that very little is gained by going to a system more sophisticated than the 6AG5 pentode unless  $R$  is very low and in this case it seems worth going to the cascode which is really a simpler modification than the one recommended in the article in question.

On the basis of the considerations above, I recommend that anyone contemplating the modification of a receiver give the situation a lot of study before he digs in with the cutting pliers; and it is my opinion that the modifications recommended in the article are not the easy way to improve a receiver.

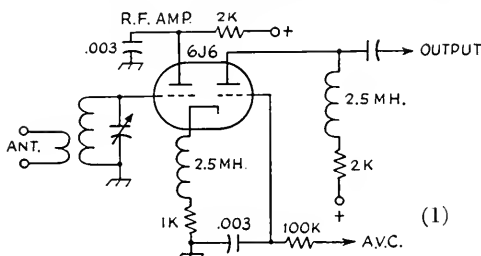
— W. B. Bernard, K6EUS, Cmdr., USN

P. O. Box 790  
Dunedin, New Zealand

Technical Editor, *QST*:

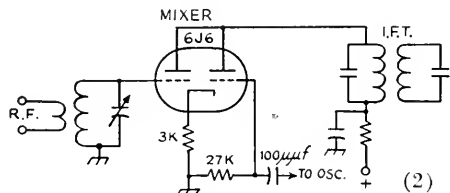
Whilst the writer can fully agree in principle with the findings of Longerich and Smith in their article on low-noise receiver design, it seems that they have taken the long way round the problem.

The 6J6 has an equivalent noise resistance of 470 ohms,<sup>1</sup> and lends itself to use in the circuit shown in Fig. 1, which



is electrically identical to that used by your contributors in their r.f. stages.<sup>2</sup>

One of the advantages of this circuit is its ability to handle signals of several volts; yet it is reasonably free from cross-modulation effects. This is because the total plate current is almost constant when the control voltage is varied. For example, a drop in the grounded-grid section plate current caused by a.v.c. lowers the bias to the cathode-follower section, which in turn increases the plate current in that section. It follows then that the cathode-follower section is unimpaired by a.v.c. bias and may handle a signal input



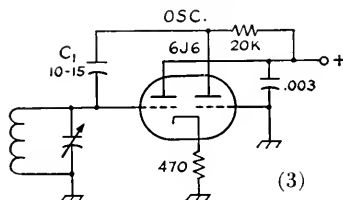
<sup>1</sup> Radiotron Designer's Handbook, 4th ed.

<sup>2</sup> Philips Valve Data Book, Philips Electrical Industries of New Zealand Ltd., Vol. 3, ECC91-2-3.

of several volts. The degree of curvature of the grounded-grid section then determines the degree of cross-modulation. The stage gain compares more than favorably with ordinary r.f. pentodes, and it may have a.v.c. applied.

Mixer tracking, instability and oscillator pulling difficulties experienced by the authors were to be expected under the conditions of nonisolation used. A mixer capable of good gain (approximately 14 times at 30 Mc.) with quiet operation is shown in Fig. 2.<sup>2</sup> This circuit has good isolation from the oscillator. Circuit gain is independent of oscillator injection-voltage change.

An alternative oscillator to that used by the authors is shown in Fig. 3. This circuit overcomes switching difficulties



since there is no cathode tap nor are there two coils to switch as in pentagrid circuits. The cathode output gives splendid isolation from the mixer and pulling troubles are virtually eliminated.

Feed-back control is by means of  $C_1$ , which should be a silver mica for best stability. The value shown for  $C_1$  is satisfactory for operation over the range 3.5 to 50 Mc., but for operation at i.f. requires a feed-back condenser value of 100  $\mu$ f., or larger, depending on the i.f. This circuit makes an excellent b.f.o., since any old i.f. transformer will suffice for the grid inductance, no tap being required. All these circuits have been tried and are in use in the writer's receiver. They are simple to adapt into existing commercial receivers, requiring only a socket change and realignment. Manufacturers seem to have overlooked these triode circuits, and it would be worth their while to experiment with them.

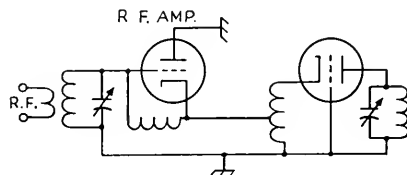
— R. S. Pottinger, ZL4GP

St. John's College  
Cambridge, England

Technical Editor, *QST*:

In the March issue of *QST* Longerich and Smith discuss low-noise receiver design. The r.f. input circuit shown is a cathode-follower amplifier followed by a grounded-grid stage. I believe their interpretation of the performance of this combination is somewhat misleading, in that it seems that they assume that the low-noise performance of the grounded-grid amplifier is not spoiled by the preceding cathode follower, or grounded-plate amplifier, and in fact, no thought seems given to the choice of a triode of low-noise resistance for the cathode-follower stage, since a Type 6C4 tube is used. The noise resistance of a 6C4 is 1140 ohms compared with 220 ohms for a triode-connected 6AC7. The combination used by the authors would be somewhat inferior to a low-noise design using a single pentode-connected grounded-cathode amplifier employing a Type 6AC7 tube.

Basically, the circuit used by the authors is a grounded-plate grounded-grid triode amplifier. The conventional circuit is (simplified):



Here neutralization of the first stage is required except perhaps for the case where triode-connected pentodes are used.

The cathode interstage coupling coil is designed to present optimum admittance to the grounded-grid tube for  
(Continued on page 126)



# Correspondence From Members -

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

## NEW SYMBOLS

Box 364  
Bellport, N. Y.

Editor, *QST*:

... I am particularly offended by the new designations for inductors and chassis grounds. ...

— William R. French, W2NYC

2521 W. Cold Spring Lane  
Baltimore 15, Md.

Editor, *QST*:

I protest! Back to the old symbols. Perhaps I'm used to the old ones after all these years, but I certainly can understand the old ones without redrawing the circuits. Let's not be too much of a leader in this field.

— Samuel Geller, W3MQF

320 Winslow St.  
Watertown, N. Y.

Editor, *QST*:

... I can no longer "see" the circuit but must laboriously "feel through" the similar symbols. Incidentally, the last time I used a "chassis" which was not common to "ground" I got 1100 v. d. c. and came to consciousness 10 feet away. Shouldn't we switch back to safety?

— George Bonadio, W2WLR

West Main St.  
Chester, Conn.

Editor, *QST*:

... I suggest that for the next few issues of *QST*, you set it up in German script, which would go well with the new diagrams, and help us over the transition period. We all would then concentrate more on the diagrams and less on the text, and thus more easily learn the new and forget the old.

Of course I am not really serious as I can see the advantages of standardization, although it is rather bitter to take in one gulp.

— G. Roger Gladding, W1AOS

P. O. Box 69  
Billings, Mont.

Editor, *QST*:

... Maybe the alphabet should be revised too. It too has a lot of little loop holes to fill up with ink like the old coil symbol. Wonder how many of those responsible actually use the "New Look" in their daily sketches? My soldering iron didn't get much work out from the past two issues of *QST*. But, I suppose in due time we will all get accustomed to it. It is about time the different branches of the electronics industries standardized in their symbols.

— S. P. Guth, W7KGF

## THIRD-PARTY TRAFFIC

51 Pettits Lane  
Romford, Essex, England

Editor, *QST*:

After reading the letter from W1DLO on the above subject in May *QST*, I feel that I ought to correct a widespread misunderstanding regarding G stations. We are not allowed to accept or originate third-party messages in any shape or form as laid down by our license conditions, and any station so doing is liable to receive the G equivalent of a pink ticket by return of post.

In the past I have heard W stations calling specific cities in this country and saying that they have traffic. They have probably been disappointed in not receiving a reply, and I hope the true reason will be appreciated.

While on the subject of traffic, may I enter a plea for the

removal outside the ham bands of the MARS stations in Europe and Africa who clutter up our frequencies with high-power stations passing military traffic only. These messages generally relate to movement of personnel and supplies, etc. The stations use amateur call signs and are prevalent on the 20-meter band. In Europe we suffer enough commercial QRM on this band without this addition, and I would have thought that the operators, who appear to be hams, would have appreciated this fact. Presumably, however, this operation has official backing.

— R. F. Stevens, G2BVN

602nd AC&W Sq., Box 325  
APO 34, New York, N. Y.

Editor, *QST*:

... Although I could write a great deal pertaining to flag waving and sentiment, I feel it would have little effect on the FCC. I can fully understand the need for the law; however, I cannot see why it should pertain to military personnel.

All DL4 stations are U. S. military personnel. Although the licenses are issued by the German government, all exams are given by U. S. military officers, all stations are located on property controlled by the U. S. government, and the majority of the equipment is owned by the U. S. government. This certainly makes us controlled more by the U. S. government than most parties listed as free to handle third-party traffic.

The majority of the DL4s are MARS operators and just about all the operating is done from MARS-controlled stations. However, there is only one MARS frequency on which conditions and power permit us to reach the States. This is hardly enough to handle priority traffic (pertaining to deaths or serious illnesses) much less normal traffic.

I would certainly appreciate you giving our side of the situation the same consideration you gave the opposite side.

— A/2C William B. Sanders, DL4TU

## LEVELING PROCESS

19 Paton Street  
Piccadilly, Manchester 1  
England

Editor, *QST*:

I read with disappointment the letter from one of our fellow Gs on the subject of QRP (April *QST*).

What he says may be true of a certain type of ham; one, say, who believes in bringing everyone in every way down to his level. But it must not be imagined that we all feel like that. Some of us are very tired of this leveling-down process we are subjected to over here, and would hate to see it applied where it does not exist in other countries.

Our friend's suggestion of a general limitation to 150 watts does not seem to me to offer any solution to his complaint, and even if this was the case, some would get out better than others, and there would still be the same number of stations. I suppose he would then start a campaign for half-wave dipoles only to be used.

Finally, if some brother ham wants to spend some of his money on a bigger and better rig, I say good luck to him. ...

— N. S. Potter, G3GNC

## 75-METER COMMERCIALS

121 East 6th  
Junction City, Kans.

Editor, *QST*:

I wish to comment on c.w. in the 'phone bands, especially 75 meters.

The skip has been long this past winter and if the 'phone men had taken a little time to read what the c.w. stations

(Continued on page 142)

# QST—Volume IV

## Part I† — Foreword to Sumner B. Young's (WØCO) Index

VOLUME IV of *QST* was the second complete Volume to be published under the management of a full-time editor (the late K. B. Warner). It was issued during the period August, 1920, to July, 1921, inclusive.

Volume III of *QST* had been a big one, as readers of my index will have seen; but Volume IV was to surpass it, both in size and importance.

As a "background" for Volume IV, let us review some of the events covered by Volume III.

A great "boom" in amateur activities had followed restoration of transmitting privileges in October, 1919. Amateurs had begun flocking to local and regional meetings. On a small scale, "tube" transmission had begun; and the new editor had encouraged it enthusiastically. A few progressive amateurs had "taken up c.w." despite the coolness toward it which many friends of the spark transmitter had instantly displayed. With the advent of Volume IV, the groundwork for further progress in this (and other) fields had been accomplished.

One of the most interesting items in Volume IV is an editorial published in the September, 1920, issue ("In Introspect"), which contains a review and an evaluation of the happenings of the previous twelve months. As of that date, it was Mr. Warner's opinion that during the first year of amateur work following the restoration of transmitting privileges in October, 1919, the development of "tube" transmitters had constituted our most significant achievement. Despite the difficulties of obtaining power tubes (not yet placed on the amateur market), and regardless of the expense of producing suitable high voltage power supplies for the plate circuits, the "pioneers" had done the job. Some of them had held Special or Experimental-Station licenses, and could lawfully operate on wavelengths around 300 to 350 meters — which was a distinct advantage, because most of the early c.w. transmitting circuits (a term loosely applied to c.w., i.c.w., and 'phone arrangements) would not operate below 300 meters. Others, who had held only General amateur station licenses officially limiting them to waves not exceeding 200 meters, had also participated in this early work (with or without a special permit); but the Department of Commerce had been indulgent; and, in any event, it had lacked sufficient personnel and financial appropriations to enable it to "crack down", even if it had wanted to do so. Nobody had paid much attention to the 200-meter restriction, even in the case of spark

stations; and (in 1920–1921) the over-all average amateur wavelength in actual use was at least 240 meters. (See Warner's editorials, at 31–32, January 1921, and at 25, April 1921.)

Volume IV of *QST* records some significant events occurring in the c.w. field: (1) In the Spring of 1921, the R.C.A. power tubes arrived. The famous "5-watter" (the UV 202) was first released. Then came the very-popular "50-watter" (the UV 203), and the announcement that larger tubes (not so important to the widespread development of the art, as it turned out) would be released in fall of 1921. (2) P. J. Furlong's article on the electrolytic rectifier was published. (3) E. W. Whittier's article gave data on the famous "1DH" c.w. circuit (also called the "sure-fire c.w. circuit", the "reversed-feedback circuit", the "Stanley circuit" and the "British-aircraft circuit"). And (4) John Reinartz published his memorable article on his "C. W. Tuner".

Events (3) and (4), in the above list, showed amateurs how to operate "tube" transmitters on 200 meters, or on wavelengths even below 200; and they also taught them how to receive, and to hold, a c.w. signal over a wide range of wavelengths. As a result, more tube sets went into operation, down below 300–350 meters.

Another characteristic of the busy and eventful months covered by Volume IV of *QST*, was this: Hams had become so numerous, that some means of controlling their own "use of the air" had become imperative. Almost everybody was operating at about the same wavelength (240 meters; not at the legal maximum of 200 meters, or below it). Spark transmitters — notorious "QRM-producers" — were still the most widely used type of rig. Practically none of the c.w. stations were using "pure c.w." (see 57, July 1921); and the radiophones created so much interference that one expert (Kruse) reached the conclusion that as far as he was concerned they were "an obnoxious perversion of the c.w. set". (57, July 1921).

The resulting din in the ether was terrific.

Note that this QRM situation was still very largely an amateur affair. It is true that some broadcast-listeners (BCLs) had also arrived on the scene; but the great public "rush" to equip one's home for the reception of broadcast programs did not get under way until fall of 1921.

The principal method of resolving this particular problem was quickly developed. It was the so-called "Chicago Plan", originated by F. H. Schnell and R. H. G. Mathews, and sponsored and administered, originally, in the Chicago area, by the Chicago Executive Radio Council. A time schedule was agreed upon, and enforced. Different classes of

† For previous installments see following *QST* references; Part III of "QST—Volume III," June, 1955; "QST—Volume I," October, 1954; "QST—Volume II," February, 1955; Part I of "QST—Volume III," March, 1955; Part II of "QST—Volume III," April, 1955.

amateur radio communication were allotted a place on the schedule; and (for a while at least), great improvement in operating conditions was achieved. This plan depended upon the organization of strong clubs — particularly near large centers of population. It had the outstanding merit of providing an essential function for those clubs to perform; and, for that reason, it tended to develop a fine group of local and regional organizations affiliated with the League.

The "Chicago Plan" spread rapidly over the U. S. A. But when (at a later period of time) the problems connected with BCI became so numerous and so serious that amateur radio's very existence was endangered, this scheme proved to be inadequate. (We shall see, later, when we examine Volume V of *QST*, that attempts to bring the BCLs into the amateur clubs, and to make these listeners parties to any agreements about "use of the air," were hopeless; and that only *technological* solutions were of any avail.) It is true that even back in the period extending from August, 1920, to July, 1921, some of the more far-sighted amateurs suggested that the development and use of waves below 200 meters was imperative, from the standpoint of *QRM avoidance*.<sup>1</sup> Unfortunately, their views were little noticed. But, "for the record," I wish to draw your attention to three items: (1) The work of Professor R. V. Achatz, City Manager in Lafayette, Indiana;<sup>2</sup> (2) A remarkable letter from F. B. Llewellyn;<sup>3</sup> and (3) An instructive and well-reasoned letter from W. F. Scott (2PP).<sup>4</sup>

The period with which Volume IV of *QST* deals was also characterized by other problems. One concerned allotment of wavelengths below 200 meters at a time before the full usefulness of such waves had been even faintly proved:

<sup>1</sup> In fact, suggestions to this effect had been made as far back as October, 1919. See 26 to 27, October 1919. Other references: 20, January 1920; 17 to 18, February 1920; 13 to 14, February 1920; 40, December 1920; and 35, November 1920.

<sup>2</sup> 44, June 1921. This is an item under "Strays," and reads: "We are proud of the city of Lafayette, Indiana. Professor R. V. Achatz of Purdue University, City Manager, reports he has his city tuned down to 200 meters, and has personally checked up every station under his jurisdiction, with several of the smaller stations operating on 160 and 180 meters. Let's have more cities like Lafayette." (Italics by S.B.Y.)

<sup>3</sup> 59, 64, January 1921. This letter points out the great difficulties to be faced in attempting to eliminate interference by time-schedules, and then says: "... The new plan is taken from Naval procedure.

"The idea is based on a change of wavelength. A designated wave is fixed on which all calling shall be done. Other wavelengths are arranged so that once having established communication, it is a simple matter to shift to a wavelength on which there is no interference. . . .

"The amateur is limited to 200 meters. During the war the Navy used a wavelength of 52 meters for short distance work. Amateurs whose powers do not exceed  $\frac{1}{4}$  k.w. could use 100 meters or less without a very appreciable decrease in range. They would then be free from jamming by higher powered amateur stations.

"Each higher powered station should be tuned to a slightly different wave under 200. It would not be difficult to have these waves published in the call books.

"Under these circumstances a common calling wave would not be necessary. . . ." (Italics by S.B.Y.)

a series of attempted "grabs" by the U. S. Navy commenced.<sup>5</sup> Another involved the assignment of wavelengths around 300 meters: the A.T.&T. wanted these for use in ship-to-shore telephony.<sup>6</sup> Editor Warner thoughtfully sounded the warning that it was necessary for the radio art to develop every single wavelength which could be put to practical use.<sup>7</sup> How many of us paid attention, I do not know.

Closely allied with wavelength allocation problems were activities in the legislative field. With the rise of broadcasting, and the development of interest in short waves as a potential source of many communication channels, the old Radio Act of 1912 had begun to "break down." It did not confer upon the Secretary of Commerce adequate means and discretion, in the matters of: the classification of radio stations, the prescription of the services which they should perform, and the specification of the frequencies upon which they should operate. He even lacked power to deny a request for a broadcasting station license which actually (from the standpoint of public interest, convenience, or necessity) would clearly be improvident to issue. Although the first of the so-called "National Conferences" between representatives of the radio industry and various governmental agencies was not held until February 27, 1922,<sup>8</sup> Secretary Herbert Hoover (at an earlier date — in 1920) named a committee to recommend a new radio law "to meet modern conditions"; and he appointed Mr. Charles H. Stewart (of St. David's, Pennsylvania) to serve on it as the League's representative.<sup>9</sup> In 1920, this committee, "consisting of representatives from every radio interest in the country" gave consideration to the question: What should be the amateur's wavelength assignment in the new law to be recommended

<sup>4</sup> 55 to 56, December 1920. Scott described and diagrammed a tuned spark-coil set, using a Century buzzer as an independent interrupter, giving a good 500-cycle note. Means of bringing the primary circuit of the spark coil itself into resonance with the frequency of the buzzer, by means of a large choke having a sliding metal core, were disclosed. This transmitter covered 10 to 20 miles, with an input of 8 to 10 Watts, on "200 meters." The letter then states: "... With the same set using a smaller condenser and a loading coil in the open circuit, signals have been transmitted about a mile on a portion of the lead-in 25 ft. long and 20 ft. high. The wave used was about 180 meters. Good radiation was obtained but very few sets in the vicinity were able to get down to some of the low waves used.

"Through these experiments I believe it is entirely possible for amateurs to have a small indoor aerial for work on waves as low as 100 meters and with which local communication could be carried on successfully, thus eliminating some of the QRM on 200." (Italics by S.B.Y.)

<sup>5</sup> 33, July 1921. This editorial indicates that the Navy wanted a wavelength, down below the suggested amateur wavelength assignments, for "chaser boats."

<sup>6</sup> 33, July 1921. The editorial "What We Want in Radio Law," here cited, states: "... with the Navy below us and the A.T.&T. above us, both clamoring for more room, believe us, we would like to see our wavelength written into the law so that there would be no question about it. . . ."

<sup>7</sup> 33, July 1921. "... the intensive development of radio demands that use be made of all waves. . . ."

<sup>8</sup> See "The Memoirs of Herbert Hoover," (Volume called "The Cabinet and the Presidency"), pages 139 to 148.

<sup>9</sup> See Warner's editorial: "In Introspect," at 23, September 1920.

by the conferees? The answer was this: 180 to 220 meters, for spark stations, and 180 to 250 meters for c.w. stations.<sup>10</sup>

As of June, 1921, no less than seven radio bills were pending in Congress.<sup>11</sup> The most "unpalatable" of these was "Senator Poindexter's infamous S. 31."<sup>12</sup> Offsetting this, was Congressman White's Bill, H.R. 4132.<sup>13</sup> An ARRL "legislative committee" was watching developments; and Secretary Warner visited Washington to gather information and to report his findings.<sup>14</sup>

The June, 1921, issue of *QST* also mentions the fact that the Department of Commerce had sent a representative to Paris in the year 1920 to attend a *preliminary international conference*; and that the report prepared at that gathering was "already influencing practice in the choice of wavelengths, in the classification of modern types of radio systems, etc."<sup>15</sup>

The period of time reflected in Volume IV of *QST* was also marked by the rise of the big conventions. These eventually were to lead to a National Convention, at Chicago, in September, 1921. The large-scale affairs held at Philadelphia, St. Louis, New York, San Francisco, and Chicago, were the most noteworthy.<sup>16</sup>

In this same period, amateurs, in coöperation with the U. S. Bureau of Standards, participated in several series of so-called "fading tests", in an attempt to discover the causes of fading.

First transmissions were on 250 meters. Some later transmissions were made on 200 meters. Both spark and tube transmitters were used.

The scientific results were not of great importance; but the several series of tests represented an outstanding example of amateur coöperation with government agencies.

In the April, 1921, "fading tests," one station (9ZN, at Chicago) operated two transmitters, simultaneously, on 200 meters; 3XF and NSF were "on the air," at the same time (on 200), with i.c.w. sets; and 9LQ and 9JZ transmitted (on 200), at the same time using synchronous-spark transmitters.<sup>17</sup>

Other coöperative activities involved the use of amateur stations to disseminate police, Market-Bureau, and Weather-Bureau reports and information. A report received (from KUVS) by Messrs. Richard Frank and William Mitchell, who operated station 2TK, at Union Hill, N. J., resulted in the recovery of the first "hot" car to be located with amateur help. This was about March 21, 1921.<sup>18</sup>

With the increased use of radiotelephone transmitters, in particular, amateur stations began to be used for broadcasting, and for other purposes which have long-since been declared illegal.<sup>19</sup> (When we study Volume V, of *QST*, we shall see some of the consequences of the indiscriminate use of poorly operated amateur radiophone stations.)

The spark transmitter was still a favorite, with most amateurs; and, in fact, some of the DX records held by such stations as 2BK, 2RK, 6JD, and 9ZN, were "mighty impressive."

2BK was heard in Los Angeles, by 6KA, on April 19, 1921, at about 4:38 A.M. (EST).<sup>20</sup> The world records of 2RK (J. K. Hewitt, of Brooklyn, N. Y.),<sup>21</sup> listed on page 43 of the February, 1921 issue, included the following items: (a) December, 1920 — copied by an American ship, from New York to London and return; (b) Copied on a Grebe CR-6 receiver, by an English vessel, at Gibraltar (3,200 miles); and (c) Reported heard off Pernambuco, South America, on a Navy SE-1420 (non-regenerative) receiver, a distance of 3,600 miles.

Stations 6JD, 9ZN, and 1AW, "hung up" a new record for a round-trip "transcon" message, on the night of January 17th-18th, 1921, when they handled one "over and back," in 6½ minutes.<sup>22</sup>

DX work, and large scale message handling, with various types of tube transmitters also began to be reported. These reports were impressive, largely for the reason that the power of most c.w. stations (as of, say, July, 1921) was under 50 watts.<sup>23</sup> Station 2ZM was heard (on

<sup>10</sup> See Warner's editorial: "What We Want in Radio Law," at 33, July 1921.

<sup>11</sup> See Warner's editorial: "The Legislative Situation," at 28 to 29, June 1921.

<sup>12</sup> 28, June 1921. See, also, 5 to 6, 12, December 1920. ("Dangerous Legislation Confronts Us".)

<sup>13</sup> 28, June 1921.

<sup>14</sup> 28, June 1921.

<sup>15</sup> 21, June 1921. See, also, 5, December 1920, which speaks of an International Communications Conference to be held in Washington, in October, 1920.

<sup>16</sup> On Philadelphia, see: 40, February 1921; 26, April 1921; 41 to 43, April 1921; 23, September 1920.

On St. Louis, see: 31, December 1920; 37, December 1920; 9 to 16, 19, 23, February 1921 ("Rotten S.O.L.", by "The Old Man"); 30, February 1921. ("Hams" from all 9 Districts were present. See 14, February 1921.)

On New York, see: 47 to 49, May 1921. The total attendance of this one reached 5,165; of which 2,765 were "paid admissions", and the balance were "repeater attendants", admitted on "season tickets".

On San Francisco, see: 32, 48, February 1921. Formation of a separate league was voted down. Attendance was nearly 600.

On Chicago, see: 38 to 39, August 1920; 21, October 1920; 31 to 34, October 1920; 34, 37, October 1920;

On plans for a National Convention, see: 26 to 27, July 1921; 55, July 1921.

<sup>17</sup> See 23, April 1921.

<sup>18</sup> 16, May 1921.

<sup>19</sup> 52, June 1921 (broadcasting of election returns, in conjunction with the *Dallas Dispatch*); 45, June 1921 (newspaper installs an Amateur station as part of its regular news-gathering machinery); 41, February 1921 (sermons broadcast over an amateur radio station installed on church property); 46, February 1921 ("*The Desert News*", from its Special Amateur Station, 6ZM, broadcasts news-items to amateurs); 36, December 1920 (5AO sends time signals); 44, September 1920 (Young & McCombs, at Rock Island, Illinois, sends out Radiophone concerts on amateur waves); and 33, June 1921 (Doubleday-Hill Electric Co., of Pittsburgh, installs a high-powered c.w. and 'phone set "to be used largely for the purpose of handling business with their Washington, D. C., store".)

<sup>20</sup> 45, June 1921. "Old" 2PM, according to an unverified report, was copied in Los Angeles before World War One. See: 24, November 1920; and 23, April 1921.

<sup>21</sup> See, also: 23, April 1921; 30, May 1921; and 53, May 1921.

<sup>22</sup> 12, March 1921. 27, April 1921 (Trans-continental c.w. relay-route being formed).

325 meters) by a ship in the Pacific Ocean, located off Guatemala, Central America.<sup>24</sup> Frank Conrad's station, 8XK (in Pittsburgh), which used an "r.a.c." plate supply, was heard 3,000 miles away.<sup>25</sup> And on the night of July 10th, 1920, a non-amateur station, NSF, using two 250-watt tubes, and an Alexanderson multipletuned antenna, was heard in Bristol, England.<sup>26</sup>

With records like these before them, it was only natural that amateurs should speculate on the possibility of bridging the Atlantic, by means of amateur transmitters; and (in February, 1921), the first "transatlantic tests" were run. These were hastily organized and were not properly planned. In any event, the tests failed; and perhaps their principal value was to disclose certain defects of planning and of preparation which the "second transatlantics" avoided. (The story of those second tests is covered in Volume V of *QST*.)

In the May (1921) issue of *QST*, Mr. Warner (at page 16) made the interesting announcement that he would bet his new spring hat that if a good U. S. amateur were sent to England with a standard American regenerative receiver (using variometer tuning in the secondary and tertiary circuits), and with an Armstrong superheterodyne, "reception of U. S. amateurs would straightway become commonplace." (Italics by S.B.Y.)

Volume IV also records the results of the "Ideal Relay Spark Transmitter Contest." This represented the first orderly and systematic attempt to collect, and to summarize, the learning which amateurs had acquired on any one subject. By the time when the findings were published, however, the "shift-over" from spark to c.w. had acquired considerable momentum; and amateur spark transmitters had only a short time to live.

Emergency and relief work, by amateur stations, during the period covered by Volume IV of *QST*, was almost nil. Cushing, of Duxbury, Mass. (1FBF) performed the most noteworthy work within this category: On November 28, 1920, the U. S. Minesweeper *Swan* went ashore, near that place, in a terrific northeast gale. She was unable to "raise" the Boston Navy Yard, on her radio; so Cushing relayed her traffic to KQZ (S.S. *City of Rome*). She, in turn, passed it on to NAD. (The crew of the *Swan* was rescued.)

The best "reminiscences" published in Volume IV were those written by Irving Vermilya, concerning the "passing" of old WCC (Cape Cod). These will be found at 16 to 17, August 1920.

In the short-wave field, the advent of John Reinartz's "C.W. Tuner" provided a means of receiving waves down as low as 150 meters.<sup>27</sup>

But commercially-built receivers were still inadequate for reception of signals below 200 meters. The September, 1920, issue of *QST* reported<sup>28</sup> that "old" 6KL (William Wood), now Canadian 5BR (of Vancouver, B. C.) was transmitting on 100 meters, with 1½-k.w. of power, and that he was hoping to contact some U. S. amateurs in the 7th District. (I have since wondered what results he had down there.)

The November (1920) issue, at page 35, announced that E. A. Bessey (6BR, of Sunnyvale, California) had installed "a new panel-type transmitter designed for 150, 200 and 375 meters"; and it stated that this would "greatly relieve the QRM situation."

At page 40 of the December (1920) issue, I find that John D. Hertz (7ZB, of Portland, Oregon) announced that he would do local work, on c.w., on 150, 175, and 200 meters. (Again, I wish I knew what the results of his work turned out to be.)

Sunspots, magnetic storms, and Aurora-Borealis effects were noted by various amateurs.<sup>29</sup>

A "dead-spot", near Savannah, Georgia, was explored by 4YA. He arranged tests between a radiophone station, mounted in a truck, and other amateur stations.<sup>30</sup> Two other "deadspots" — between Springfield and Boston, Massachusetts, and between Springfield and Worcester, Massachusetts — were also noted, but were not explored.<sup>31</sup> The Bureau of Standards sought data concerning "dead-spots" at sea.<sup>32</sup>

In the "miscellaneous" category, readers of the Index to Volume IV of *QST* will be interested in the following items:

(a) *League affairs:*

League Officers began to visit hams in various parts of the U. S. A.; and Mr. Maxim became the first League officer to visit amateurs on the West Coast.<sup>33</sup> While in San Francisco, he made an address over the De Forest radiotelephone station.<sup>34</sup>

F. H. Schnell became the League's first full-time Traffic Manager.<sup>35</sup>

During the Midwest Convention at St. Louis, the League's Board of Directors met in that city; and "for the first time our directors from the west and south actually sat in with those from the east and north."<sup>36</sup>

At the Pacific Division Convention, in San Francisco, "the question arose of forming a separate relay league on the Pacific Coast, to be entirely independent of our American Radio Relay League." This was overwhelmingly defeated.<sup>37</sup>

(Continued on page 138)

<sup>24</sup> 35, July 1921. In April, 1921, it was stated that 2ZL (J. O. Smith, of Long Island, N. Y.) was probably the most-powerful amateur c.w. station. See 27, April 1921.

<sup>25</sup> 52, May 1921.

<sup>26</sup> 12, May 1921. See, also, 32 to 34, September 1920, for a description of 8XK.

<sup>27</sup> 52, November 1920; 25 November 1920. For a description of NSF's equipment, see: 5 to 6, September 1920; 8, November 1920.

<sup>28</sup> 5 to 7, June 1921.

<sup>29</sup> 31, September 1920 (in the Northwestern Division report).

<sup>29</sup> See 27 to 28, June 1921; 40, July 1921 (Phelps' report); 62, July 1921; 53 to 54, July 1921; 13 to 14, January 1921.

<sup>30</sup> See 32, May 1921 (Merritt's report).

<sup>31</sup> See 36, July 1921 (Entwistle's report); 33, January 1921.

<sup>32</sup> See 22 to 23, April 1921.

<sup>33</sup> See: "East Meets West", at 24, September 1920.

<sup>34</sup> See: 44, September 1920. This was the 1-k.w. set, located at the California Theatre, San Francisco, California.

<sup>35</sup> 26, November 1920.

<sup>36</sup> 30, February 1921.

<sup>37</sup> 32, February 1921.



# Y L NEWS and VIEWS

BY ELEANOR WILSON,\* W1QON

## Results — YL-OM Contest

The Sixth Annual YL-OM Contest sponsored by the Young Ladies Radio League attracted more YLs and OM's than ever before. Two-hundred seventy-four logs were received, an increase of about 100 over 1954. One hundred sixty-eight of the logs came from OM's, along with such comments as:

"Didn't realize there were so many fine c.w. operators — and so patient they would operate at any convenient speed."

"The thrill of a century — will be aboard next year."

"Lots of fun — more girls on c.w. this year."

"Having c.w. and 'phone on separate week ends excellent."

The following message was received from YLRL Vice-President Gilda Shoblo, W6KER:

"I wish to thank everyone for sending in reports, and of course, my heartiest congratulations to the winners, as well as my condolences to the very fine losers. In the long run we all win. Some of the reports have been altered, mostly due to contestants sending in combined scores. I hope the tabulations and awards are as near correct as possible; if not, I shall be very happy to make corrections. Also, I shall be pleased to receive suggestions and comments on the contest, so that the next officer can know of any changes desired by the contestants.

Since the rules of this contest were published, I have discovered there is a Silver Cup awarded specifically for top or aggregate score. Since this cup is awarded and so inscribed for this "specific" category, and due to the many, many aggregate scores sent in for this award (ostensibly), having no alternative but to give this to the winners for which it is intended, I have done so."

## YL SCORES

Aggregate YL Winner: W4HLF, Arlie Hager, 27,682. Highest c.w. scores: W4BLR, 10,755; W4HLF, 10,132; W9JUI, 7880. Highest 'phone scores: W4KYI, 25,818.75; W1SCS, 24,096; W4HLF, 17,550.

\*YL Editor, QST. Please send all contributions to W1QON's home address: 318 Fisher St., Walpole, Mass.

Station	Aggregate	'Phone	C.W.
W1OAK	528	—	528
W1QON	315	315	—
W1RLG	5460	—	5460
W1RLQ	4792.5	4792.5	—
W1SCS	24096	24096	—
W1UKR	5126.25	4531.25	—
W1VOS	1068.25	1068.25	—
W1VYH	192	192	—
W1WFX	3250	—	3250
W1YNI	193	—	193
W1YPH	3177.5	987.5	2190
W1YYR	5605	—	5605
W1ZUR	2291.25	2291.25	—
W2BNC	3698	2006	1692
K2CUQ	1237.5	—	1237.5
K2KRL	120	—	120
K2DSI	750	—	750
K2DXD	2316.25	—	2316.25
W2EE0	1080	1080	—
W2EMU	658.75	—	658.75
K2INQ	1500	—	1500
W3CDQ	125	125	—
W3LSU	1162.5	—	1162.5
W3MAX	9140	7950	1190
W3MDJ	7992	7992	—
W3QPI	5328.75	—	5328.75
W3TYC	875	—	875
W3UTR	1040	—	1040
W3YTM	4752	—	4752
W4AHN	1181.25	—	1181.25
W4BLR	10775	—	10775
W4DWP	837.5	837.5	—
W4HLF	27682	17550	10132
W4LNL	3790.75	1954	1836.75
W4KYI	25818.75	25818.75	—
W4RIG	585	—	585
W4UTO	860	—	860
W5EGD	8066.25	2441.25	5625
W5RZJ	225	—	—
W5VUX	4522	—	—
W5WXY	3206.25	2625	—
W6CQT	4162.5	4162.5	581.25
W6EHA	4608.75	3573.75	855
KN6EIG	125	—	125
W6JZA	13991.25	13991.25	—
W6JAZ	420	—	420
W6QGX	119	—	—
W6QGZ	90	90	—
W6QMO	3330	1991.25	1338.75
W6QYL	375	—	375
W700Y	4120	4120	—
W70YA	130	—	130
W7SNP	2887.5	1870	1017.5
W8BIQ	742.5	742.5	—
W8HUX	1175	1175	—
W8HWX	4622.5	997.5	3625
W8KLZ	330	—	330
W9AQB	3685	3685	—
W9FRW	200	200	—
W9JUI	7880	—	7880
W9LOY	7038	7038	—
W9MLE	878.75	—	878.75
W9MYC	1286.25	—	1286.25
W9SIX	743.75	—	743.75
W9WZL	4306	—	4306
W9FVE	2312.5	375	1937.5
W0KJZ	1840	—	1840
W0LGG	2210	—	2210
W0OMM	3918	3750	168
W0QBP	2968	2968	—
KP4ZV	4356	—	—
KZ5DG	14520	14520	—
VE1ABT	1657.5	1657.5	—
VE2AOB	1225	—	1225

<sup>1</sup> Operated by W3QQF

The following stations submitted 'phone logs for checking purposes only: W1YNI, W2OWL, K2UTZ, W5YRT, K6s, ANG, CYZ, ELI; W6s DXI, NAZ; W7TGG.

The following stations submitted c.w. logs for checking purposes only: W4RLG, W7s RHM, RRM; VE3s AJR, DDA.

## OM SCORES

Aggregate OM winner: W1BFT, Carl Evans, 3705. Highest c.w. scores: W1BFT, 1820; W8AJW, 1820 (tie for first place); W4IA, 1102.5; W4JUI, 892.5. OM 'phone winners: W4ARR, 2287.5; W1BFT, 1885; W9CMC, 1295.



The ten YLs who attended the East Texas Hamfest at Longview in April had a "fine old rag chew," according to Maxine, W5YRT, who forwarded the above photo. Left to right the smiling femmes are: W5s UYI, UUS, RYX, WN5FDR, W5s TKM, VYI, LGY, YRT, YAJ, and VSN.

Station	Aggregate	'Phone	C.W.
W1BFT	3705	1885	1820
W1IP	108	—	108
W1JYH	636	168	468
W1OPZ	316.25	150	166.25
W1RFC	275	—	275
W1SSZ	292.5	—	292.5
K2AFQ	828.75	—	828.75
K2BWP	637.5	637.5	—
K2COB	262.5	262.5	—
K2DSW	701.25	—	701.25
K2EIU	227.5	—	227.5
W2EMV	658.75	—	658.75
K2EVP	261.25	—	261.25
W2HZZ	200	—	200
K2KDW	257.75	—	257.75
W2MCO	308.75	308.75	—
W2N1Y	543	—	543
W2UAP	165	—	165
W2WDP	643.75	302.5	341.25
W3AXT	426	228	198
W3CDG	540	—	540
W3MDO	384	—	384
W3OP	300	—	300
W3PWN	540	—	540
W3QLW	385	385	—
W3RRI	640	640	—
W3SIJ	487	—	487
W3STV	270	—	270
W3WKX	542.5	—	542.5
W3YUW	110	—	110
W3YWT	120	120	—
W4AAR	2292.5	2287.5	—
K4ATD	112.5	—	112.5
W4JUN	1411.25	308.75	1102.5
W4JUJ	1342.5	450	892.5
W4KDS	255	255	—
W4KL	245	—	245
W4OM	168	—	168
W4TRD	900	220	680
W5DXW	61.25	61.25	—
K6AUC	90	—	90
K6CUK	97	—	97
W6MES	176	176	—
W6UTZ	387.5	387.5	—
W7FK	527	—	527
W7VIU	318	151	187
W8AJW	2413	593	1820
W8FRD	308.75	—	308.75
W8JHH	672.5	375	297.5
W8JPE	336	336	—
W8LAQ	195	195	—
W8MQQ	123.75	—	123.75
W8OMK	1245	1245	—
W8RGF/2	200	—	200
W9CCO	150	—	150
W9CHD	308.75	—	308.75
W9CMC	2280	1295	985
W9DIK	341.25	—	341.25
W9EDV	208	208	—
W9FYM	616	616	—
W9GMT	4	4	—
W9KLD	675	—	675
W9OMM	1550	997.5	552.5
W9PQA	630	630	—
W9SVZ	439	—	439
W9VBZ	468.75	—	468.75
W9GAX	591.25	276.25	315
W9HFP	665	665	—
W9IUU	261.5	—	261.5
W9IUB	546	—	546
VE3AVS	275	—	275
VE3BNQ	120	—	120
VO6N	120	—	120

The following OMs submitted 'phone logs for checking purpose: W1s BUD, LQ, PO, YGR; K2s AEQ, AFQ, DSW, EUI, HID, KID; W2s BVN, CVW, CYK, IFI, UAP; W3s YG, YUT; W4s FPD, VGD, WRH/4; W5ZWR; K6DYW; W8s FAD, FRD, MQD; W9s KLD, SIE; W0s IJU, LOW, VRN, YQR.

The following OMs submitted c.w. logs for checking purposes: W1s BOW, JZA, NLM, VBR, YGR, YUN; K2s BUE, BUP, CMV, MTA; W2s BUN, CVW, NEP, OLT, REP; W3s JUN, NRE, QLV, RRI, WG, ZID; W4s FFX, GMY, RXI, WRH; K6DYM, KN6INU, W6PQK; W8s DAE, GQD; W9s EDH, FYM, PQA, RKP, SIE, UDK; W0s JBM, VRN; VE6SX.

Aggregate winners W1BFT and W4HLF each received a silver cup and were awarded certificates for various other high scores.

In 1954, W4KYI received the highest aggregate score and a silver cup. In 1955, W4HLF had the highest aggregate score and received a silver cup. The highest 'phone score (gold cup) was made by W4HLF in 1954—in 1955 the cup goes to W4KYI.

We wish to thank participants who called our attention to the fact that rules published for the 1955 contest omitted mention of a silver cup to be awarded for the highest OM combined score and a silver cup to be awarded for the highest YL combined score. We regret any misunderstanding which may have resulted from this omission.

For W4AHN, Merle McClain, of Alexandria, Virginia, the YL-OM C.W. Contest was a first

venture into a contest. Merle says that the experiences of those two days "forced" her to preserve her thoughts on paper, as follows:

### The Monday Morning Blues

My ears ring with a dit-dah tune 'tho the contest's over and I'm back to earth pushing a vacuum cleaner through a house that's a shambles. Dirty dishes in the sink—quick! close the door to the shack—hide it from human eyes. Only a ham would understand.

I brushed-up my c.w. three weeks before the YL-OM contest when a license renewal reared its dit-dah head. I gingerly touched the dit side of the bug and jumped clear across the room; the result of five years of neglect, I'm sure.

But thanks you patient OMs; all 65 of you. As for those who QRSD, I'm certain you'll go to ham heaven where there's no QRM or TVI and DX is unlimited! Forgive me, W9DO, for making a DOG of you—conditions you know, not my 13 w.p.m.

Glad to give reports on your two antennas, W3KTR, even 'tho it was in the midst of the con-



"My ears ring with a dit-dah tune"—W4AHN

test! Hope you know better than to count too much on this YL's untrained ear.

One thing boomeranged, though. Once after a number of repeats on a QTH, I was embarrassed and answered with an R. Thought I'd be smart and look him up in the call book. But the joke's on me—he's not in "Summer 1954." Moral, gals: always lead the good clean life.

Speaking of OMs, mine is a very patient one. Well, fairly patient. He'd wander into the shack and remark something like "It's three o'clock. How about something to eat?" I'd stare glassy-eyed while busily calling CQ OM. Quietly, he'd leave, but I know he didn't starve—not with all those dirty dishes I found in the sink. On Sunday I knew for sure that I had married him for better, not worse. At 0830, into the shack he strolled with a breakfast tray—HAM and eggs!

That's why I feel so bad about deliberately letting our Sunday dinner burn. A roast's the thing, I had thought. I'd just throw into into the oven; it would cook itself. I cannot tell a lie (other than a signal report). I smelled it burning and pushed the thought from my frenzied brain. A Wisconsin was calling me

(Continued on page 134)



# Hints and Kinks

## For the Experimenter



### RESISTOR HINTS

IN reworking a Q5-er, it was discovered that all resistors were conductive between the outside surface and the leads. This condition was especially prevalent in the gold-band section of each resistor. Upon breaking a few of the units open, it appeared that they had no insulating coating such as applied to present-day jobs. Apparently, the grey carbon impregnating material extends all the way to the outside of each resistor. Naturally, faulty operation of the receiver will occur if one such resistor makes contact with the chassis, another part of the circuit, etc.

— E. M. Fry, K2CW

### POWER-REDUCTION HINTS FOR S.W.R. BRIDGE MEASUREMENTS

ONE of the problems frequently encountered in making s.w.r. measurements is that of reducing transmitter power output to a level low enough to prevent damage to the bridge. In installations where there is no existing means of controlling output from the amplifier, it is possible to control the power to the bridge by means of the simple system shown in Fig. 1. In this arrangement, most of the output from the transmitter is dissipated in the 52-ohm dummy load

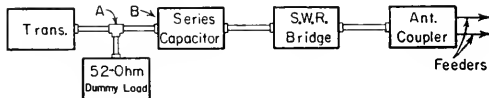


Fig. 1 — A simple arrangement for reducing power during s.w.r. measurements. A is a "T" coaxial-cable coupler and B is a variable capacitor with a range of approximately 0–100  $\mu\mu$ f.

and a portion of the remaining power is fed to the bridge through a variable capacitor.

The dummy load must be capable of dissipating nearly the full output from the transmitter. It should be shielded and equipped for coaxial-cable input. The variable capacitor should also be enclosed in a metal compartment and should be terminated with coax connectors. A standard "T" connector and short lengths of coax may be used for making connection between the transmitter, dummy load and variable capacitor.

When using this method of power reduction, the bridge is inserted in the transmitter output line in the usual manner. Then adjust the variable capacitor for normal reflection of the s.w.r. indicator and proceed as you would with any other set of adjustments or measurements.

— John W. Stack, W5QQY

### INPUT CIRCUIT FOR EITHER CRYSTAL OR CARBON MICROPHONES

THE circuit shown in Fig. 2 permits feeding the output of either a crystal or a carbon microphone to the speech-amplifier tube. The closed-circuit jacks automatically convert the circuit

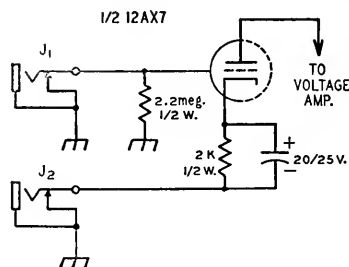


Fig. 2 — Schematic diagram of the speech amplifier designed for either crystal- or carbon-microphone input.

for whichever type of microphone is used. When using a crystal or other high-impedance microphone, it is plugged into  $J_1$ . In this application, the cathode circuit for the 12AX7 is completed through  $J_2$ . With  $J_1$  closed (microphone plug removed) and with a carbon microphone plugged into  $J_2$ , the stage operates as a grounded-grid amplifier. The second half of the dual triode is used as a conventional voltage amplifier with a gain control in the grid circuit.

— Vernon Phillips, W7NPV

### CUSTOM-MADE NAME PLATES

ALL you need to make attractive custom-designed name plates for the new rig are a package of transmitter decals (Tekni-Labels, Burbank, Calif.), narrow strips of aluminum, clear finger polish and a piece of crocus cloth or polishing paper.

The strips are cut to the desired width and length, a mounting hole drilled at each end, polished with the crocus cloth or paper, cleaned of abrasive dust and given a quick even coating of nail polish. After the polish dries, the decal may be affixed and allowed to dry thoroughly. Then one or two more coats of polish should be applied, each coat being given sufficient time to dry completely.

The result is an inexpensive indicator or name plate that is commercial looking in appearance. As the drying of the nail polish is tricky, since it dries so rapidly, it is best to experiment first before going into production. The instructions supplied with the Tekni-Labels should be followed closely.

— Rev. Joseph F. O'Reilly, W9UFL

CHASSIS-LAYOUT AID

THE construction practices chapter of recent editions of *The Radio Amateur's Handbook* makes the excellent suggestion that one commence construction by covering the chassis with a sheet of paper. The location of components, mounting holes, etc., is then marked on the paper so that the latter may be used as a drilling template for components to be mounted above deck. After drilling, the parts which require mounting underneath may be located and the mounting holes drilled, making sure by trial that no interference exists with parts mounted on top.

An easy way to ensure a good alignment of components below with those above the chassis is to place a sheet of translucent paper (onion-skin) on top of the chassis, and mark on its top surface the position of topside parts. Then place the same sheet against the underside of the chassis, unmarked side exposed, and locate the parts to be mounted inside the chassis. Since the paper is translucent, these may be easily placed so as not to interfere with components on top of the chassis.

— David Weinfeld

PARALLEL 6Y6s FOR THE SIMPLEST MODULATOR

THE simple grid modulator described by 7W6LNN in *QST* for September, 1953, has usually lived up to its name if constructed with a single tube in the output stage. However, the installation of parallel 6Y6s in the modulator has occasionally resulted in instability within the unit. With the assistance of W8RXX, and with the addition of a few inexpensive components, it has been possible to stabilize the parallel-tube arrangement. Fig. 3 shows the revised circuit which, incidentally, is used to modulate

resistors  $R_{12}$  through  $R_{13}$  are the recent additions to the modulator and are the components which stabilize the new arrangement.  $R_9$  of the one-tube layout has been replaced with a 100-ohm variable to provide a convenient means of adjusting the plate current of the r.f. amplifier. This adjustment is particularly helpful when resetting the plate current to half value after band changing.

— Philip J. Hart, W8MMK

[EDITOR'S NOTE: The simple grid modulator referred to above is also described in Chapter 9 of recent editions of the ARRL *Handbook*.]

ADDING A SPINNING REEL TO THE BOW-AND-ARROW TRICK

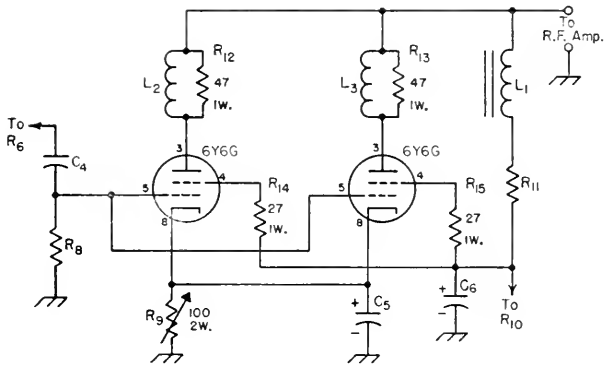
THE trick of using a bow and arrow to shoot an antenna halyard into place can be improved on by using a spinning reel and rod as a means of paying out the guide line. Four-pound nylon test line and a short rod is the best combination to use. Tie the line to the arrow just to the rear of the feathers. As the arrow passes over the top of the tree or other type of support, have the person holding the rod apply enough pressure to the reel to control the flight of the arrow. When the arrow has landed, untie the nylon line and fasten the halyard in place. Now haul the halyard back to the firing position so that the halyard and antenna can be connected together.

— E. M. Fry, K2CW

IMPROVED R.F. CABLING FOR REMOTE-TUNED VFOs

AFTER constructing and using several remote-tuned variable-frequency oscillators, it became apparent that one of the weakest points in this system is the cabling between the frequency-control box and the rest of the oscillator. Instabil-

Fig. 3 — The simple grid modulator circuit used by W8MMK.  $L_2$  and  $L_3$  are each 10 turns of No. 26 enamel wire wound over  $R_{12}$  and  $R_{13}$ , respectively.



the popular 4-250A amplifier described in recent editions of the *Handbook*.

Many of the components shown in Fig. 3 bear designations —  $R_6$ ,  $C_6$ ,  $L_1$ , etc. — which refer to the original diagram inasmuch as these parts remain unchanged in both value and placement. With respect to the original circuit, it should be mentioned that the 6SL7 section of the unit requires no modification.  $L_2$  and  $L_3$  and

ity or intermittent operation of a VFO can frequently be traced to poor contacts in the plugs and receptacles used to terminate the interconnecting coax line. I have found that Amphenol type 83-22SP and 83-22R plugs and receptacles, respectively, used in conjunction with RG-22/U coaxial cable, provide the most reliable tank-to-tube connections yet employed.

— Donald Miller, W4VZQ

# NEW BOOKS

**License Manual for Radio Operators**, by J. Richard Johnson. Published by Rinehart & Company, Inc., New York. 480 pages, including index,  $6\frac{1}{2} \times 9\frac{1}{2}$ , cloth cover. Price, \$5.00.

A question-and-answer manual covering the eight elements of the FCC commercial operator examinations. Several appendices are included, one correlating examination questions with the normal progression of theory courses in the various subjects, a second giving specific references to laws applicable to legal questions, a third listing the Q signals, and a fourth tabulating general texts with a notation of their usefulness in connection with specific elements of the examinations.

**Introduction to UHF Circuits and Components**, by Milton S. Kiver. Published by D. Van Nostrand Company, Inc. 408 pages, including index. Schematics.  $6\frac{1}{2} \times 9\frac{1}{2}$ , cloth cover. Price, \$7.50.

Although the layman naturally thinks "television" when "u.h.f." is mentioned, the subject of u.h.f. television is discussed only in one brief chapter in this volume. The book is actually a survey of components, methods and circuits in the v.h.f.-u.h.f. field generally, covering tubes, transmission lines, waveguides and antennas used in this part of the frequency spectrum. Chapters on measurements and receivers also are included. Gives a good over-all picture of the field.

**Elements of Radio Servicing**, by William Marcus and Alex Levy, second edition. Published by McGraw Hill Book Co., Inc., New York City. 566 pages, including index. Schematics.  $6\frac{1}{2} \times 9\frac{1}{2}$ , cloth cover. Price, \$6.00.

In addition to the inclusion of new material on features of a.m. broadcast receivers that have been introduced since the appearance of the first edition, new chapters have been added to cover f.m. receivers as well. The text is general, dealing with types of circuits and methods rather than specific receivers. Test instruments and their proper use are discussed.

**Elements of Radio, Third Edition**, by A. Marcus and Wm. Marcus. Published by Prentice-Hall, Inc., 70 Fifth Ave., New York 11, N. Y.  $6 \times 8\frac{1}{2}$  inches, cloth cover, 771 pages, including index. Price, \$6.00.

Very suitable for the raw beginner, as well as useful to those who have some practical acquaintance with radio circuits and want to get an elementary technical background. The book is divided into two parts, the first of which teaches by using the development of the broadcast receiver as a theme, carrying through from the simplest crystal set to modern types. This section is entirely nonmathematical. The second part is an elementary theory course developed along more conventional lines. There are questions and problems with each of the forty-two chapters.

**How To Install TV Antennas**, by Samuel L. Marshall. Published by John F. Rider Publisher, Inc., 480 Canal St., New York 13, N. Y. 124 pages,  $5\frac{1}{2} \times 8\frac{1}{2}$ , paper cover. Price, \$2.50.

About half of the book is devoted to a discussion of TV antenna characteristics, transmission lines, and pointers in selecting the proper antenna for a given situation; the remainder deals with the actual mechanics of installation. Available materials and fittings are described, and considerable attention is paid to such factors as the stresses on masts and guy wires. Much of the antenna installation data appears to be useful for amateur antennas as well.

# Preview — DX Contest High C.W. Scores

Excitement reigned supreme during the 21st ARRL International DX Competition c.w. portions. February band conditions allegedly were the best in years. Then came March and Kennelly-Heaviside lowered the boom in a sudden about-face that dihard DXers have recently learned to expect. With claimed scores, multipliers and contacts shown in that order, here are the leaders in U. S. and Canada:

W3CTJ*	524,080-255-672	W9LNM...	153,180-148-345
W28AJ	443,538-246-602	W9FJB	149,212-146-342
W4KFC	425,924-244-584	W6RW	148,920-146-340
K2EDL	400,200-232-575	W1BIH	144,525-141-342
W3DGM	386,460-238-565	W1AXA	143,934-149-322
W4DHZ	370,962-222-557	W1TYQ	140,904-152-309
W6YMD*	363,480-233-520	W1JEL	139,723-146-319
W4KXV*	360,520-232-518	VE4RO	137,160-127-360
W4CEN	330,336-222-496	W8DUS	136,782-153-298
W6ITA*	314,720-212-495	W5CKY	129,204-148-291
W3LOE	313,848-216-501	W3KRT	126,900-141-300
W3WV	313,110-213-490	W3KDF	125,936-136-310
W2WZ	309,060-202-507	W8MFW	118,491-131-321
W6TT*	284,271-197-481	W6KEV	124,605-135-309
W3EIV	277,440-204-454	W4UXI	122,264-136-301
W3ALB*	256,896-192-446	W1AZU	120,834-137-294
W6GAI/7	254,592-192-442	W4LZF	120,096-144-278
W3FGN	249,550-184-422	W6W13	119,340-130-306
W6LDI*	244,620-180-453	W6FSR	118,491-127-311
W3GHS	234,765-185-423	W3GHD	118,170-130-303
W3JTC	227,367-189-401	W2DOD	117,786-134-295
W3JTK	225,431-181-417	W4MZE	115,506-138-280
W8PQQ	220,473-187-393	W3ERN	115,411-131-297
W4VY	207,765-171-379	W3JFW	114,973-130-306
W4OM	197,488-168-372	W1BOD	113,777-131-289
W4YHD	188,710-167-377	W6LDD*	112,266-126-297
W3ECR*	187,605-165-379	W3ADT	110,565-135-273
W6AM*	185,370-167-370	W5DWL	110,336-128-288
W9IOF	174,798-166-351	W9VUL	109,620-140-261
W1BPT	171,687-151-379	W2AIW	109,263-121-301
W8BKP	169,092-158-354	W4CCO	105,605-135-267
W4DQH	168,795-155-365	W9DAE	104,931-131-267
W6VUP	165,120-160-345	W1CDB	104,775-127-275
W3GHM*	164,088-159-344	K6CIT	104,544-121-288
W3HEC	160,038-153-350	W1TX	101,748-122-278
W8HUZ	159,360-147-332	W1DLC	100,564-124-271
W8BTI	158,814-153-346		

Some tremendous totals were recorded, too, by these crack brasspounders on the other side of the fence:

KH6MG	489,066-74-2203	KL7BCH	63,342-34-621
KH6IJ	461,700-75-2052	E4ACR	63,297-39-541
VP7NM	453,726-78-1939	KH6ANK	61,047-51-399
KB2OK	307,572-76-1365	E4ALB	60,582-31-576
ZL1RY	306,048-68-1502	K4YLL	59,056-16-1233
K6GJ	303,012-57-1772	E19J	57,744-36-538
KV4AA	298,742-68-1469	OESJK	57,484-28-685
KP4CC	284,976-64-1287	DU7SV	56,064-32-584
KH6PM	237,006-63-1254	FA8DA	53,636-44-408
HL4BP	236,588-67-1610	W1CDB	52,745-127-275
KP4DH	232,056-62-450	CT1AB	46,020-65-236
KP4ZW	222,912-64-1354	DL1JW	45,141-41-371
KH6AYG	211,062-58-1216	FSVJ	44,506-34-438
LU3EX	185,304-56-1103	CE6AB	44,170-35-420
EL2X	182,373-53-1147	CO2BM	43,848-29-504
ZL2GS	166,869-59-694	TF3MB	42,153-17-64
DJ1HZ	167,193-47-991	CE6AB	42,874-35-435
VP7NG	130,520-52-840	OZ1W	42,600-30-488
EAD9F	127,872-37-1152	YV5BJ	42,441-43-345
OQ5GU	113,085-45-845	FTFHE	42,091-49-287
PY7AN	109,620-45-812	KH4BD	41,220-30-465
CR6AI	104,200-40-871	HR6LJ	40,560-26-520
DL1KB	101,292-46-746	FP8AP	39,360-30-445
KV4BK	100,750-31-1150	KP4YT	39,144-42-312
CE3AG	98,340-44-745	JA3AF	38,394-27-476
OJ13USA*	97,965-35-840	CE4AD	37,842-34-371
Y49W	93,008-47-694	EABAF	37,760-32-396
PE2AR	93,149-49-641	EABAF	35,506-36-322
EABBF	92,720-40-778	HKQAI	32,098-22-499
DL4ZC	91,875-49-625	G2QT	31,472-28-380
G5RI	89,712-48-623	LU8FBH	31,119-23-451
KH6SF	88,900-40-740	DL1BR	31,080-37-280
KL7AC	81,243-51-531	GW5SL	30,385-24-424
KL7AWB	80,811-41-657	IINT	29,970-27-370
PA0UN	77,520-38-680	IFBNU	29,818-34-293
DL1DX	76,956-44-583	FB5JC	29,526-37-266
OK1MB	76,440-40-654	YV5AE	28,980-23-420
PJ2AN	72,116-44-558	IBDVB	27,360-24-380
KT1UX	69,966-39-598	ZESJA	26,730-30-297
VK2EO	68,112-33-683	JA3AF	26,940-26-339
		PA0VB	25,560-30-284
		E19Y	25,146-22-393

\* Multioperator station.

A complete report will appear in these pages as soon as possible.

# How's DX?

CONDUCTED BY ROD NEWKIRK,\* W9BRD

## Whom?

It's time we dipped into our DXtensive backlog of potential "How's" badinage and drew forth a sequel to our Pearl Harbor comments in last December's *QST*. You'll recall we inquired as to the identity of the DXer — DXer X, if you please — who was communicating with K6SRZ on 20-meter 'phone at 0700 Hawaiian time on the morning of December 7, 1941. This intriguing research project was initiated by W2TNC, K6SRZ operator at the time.

Well, the plot thickens, if anything. Though we didn't scare up the western W who held down the Stateside end of that historic QSO we did raise a casual eavesdropper who also heard the stick of bombs that overloaded K6SRZ's modulator one fateful Sunday morn over thirteen years ago. It was W7GAT, then news chief of the weekly *Oregon Statesmen* (Salem, Ore.) and now publisher of the Mount Vernon, Washington, *Argus*. Steve swells to a grand total of two the number of persons who heard one of the most momentous transmissions in ham history. We excerpt from a yellowing page of the special *Statesman* extra dated that December 7th:

### Hawaiian Ham Tells Salem Radioman of Things Amiss

"This looks bad! I can't stay in this place!"

An excited, doubtless frightened, voice spoke those words over the 20-meter radio band Sunday forenoon, tipping off [W7GAT] that something was amiss in the Hawaiian Islands.

"Can't talk anymore," the voice said. "Signing off — you take over."

Then the Hawaiian operator shut off his station and a Salt Lake City amateur responded: "Okay, but you didn't say what was the matter. 73 . . ."

No time to polish the doorknob on that QRT! This clipping considerably narrows the search for Station X — beyond much doubt he was a W6 in the Salt Lake City area. But where is he now? What part, if any, did he later play in the hostilities he so dramatically heard begin? These questions and others may never be answered, for Station X seems to have vanished into the past along with the lost logs of old K6SRZ.

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Bouncing back after May mayhem at the hands of DXHPDS antagonists, W6MUR disturbs us with excerpts from his latest treatise on avocational communicational diseases. The following ailments are identifiable with DX hunting in particular:

**Operational Turpitude** — A contagion resulting from excessive exposure to DX contests.

\* Please mail all reports of DX activity to DX Editor Newkirk at 4128 North Tripp Ave., Chicago 41, Illinois.

**Figmentary Impotence** — Frustrating inability to raise the "easy" ones in DX contests.

**Immedicable Perpetuophobia** — Screaming mimies as a result of agitation through immersion in pile-ups.

**Mental Plausibilianism** — Reflexive log entries made when rare ones come back to people with calls like yours.

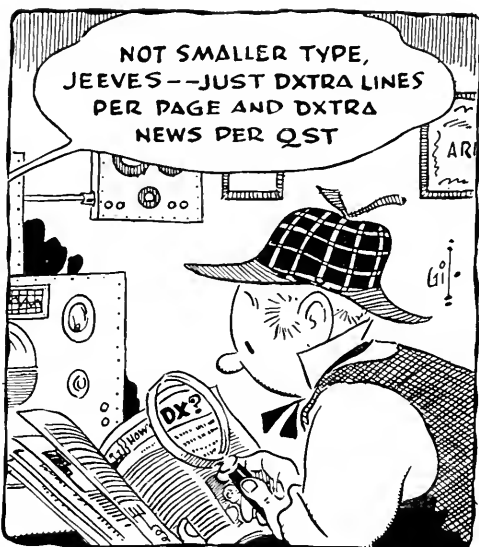
**Radiational Astigmatism** — A strange malady that causes its victims to answer directional CQs of any and all types.

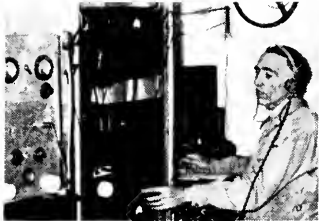
**Flatulent Amphigoria** — Cultivation of a permanent sneer brought on by DX column flashes about DXpeditions to HV, ZA and Northeast Dontundustan.

These afflictions have several symptoms in common — glazed eyes, twitching elbows, desultory mumbling — and accurate diagnoses are difficult. Beyond all dubiety the DX Bug is secondary host to the infectious parasites involved. Beware!

## What:

20 c.w., now frequently open around the clock in northern latitudes, gives evidence that better days are at hand. DL4ZC's noncontest 19-minute WAC with VK4YP, LU1AR, JA7AD, DJ1ER, W4PVD and FA3OA in late May is a tantalizing sample of what we can all anticipate from the rising o.u.f. Lloyd also worked FB8BE, KG6AFY 12, LU1ZV 21, a UF6, ZDs 6EF 18-19 and 9AB 18 . . . HZ1AB QSOd AP2Q 11, CT2AF 17, DU1NL 15, EA6AU (35) 13-21, ET3LF 12, KT1EX 11, MP4BBL 16, a UA4, VK9AU 12 and VQ3CF (74) 13-15, plus dozens of W/K pursuers . . . GM3AIM (43) 21 of the Hebrides, representing a rare entity on DARC's WAE List, came back to W2FJH. Len will linger there until September and then return to G3AIM in Liverpool . . . CR4AF (20) 0, HA7KLD (37) 21, HI8WF (17) 23, JZ0AG (98) 15, KJ6BG (46) 3, OYs 2Z (63) 22, 7MIL (68) 22, TG9CR (79) 23, a UB5, VK9RM (65) 13, VP1FL (25) 23, VSs 2DW (57) 16, 6CG (20) 13, 6DD (44) 12, ZDs 2DCP (87) 21 and 8AA (3-100) 22-0 worked W9TCY, son of equally enthusiast DXer W9RMH . . . K6ENX found conditions to Europe much improved and nailed CE7ZJ (40) 15, CX2BP (5) 1, CP3CA (50) 2, FASZZ (30) 21, FO8AL (40) of Tubuai isle, LU7ZT (40) 2, a doubtful OD5AB, PJ2s AI (60) 15,





Sunspot numbers again soar upward, north Atlantic propagation paths become more solid day by day, and it won't be very long before S9-plus Europe-U.S.A. QSOs are the 14-Mc. rule rather than the exception. OZ2KR, I1ER and CT1CO, pictured here from left to right, are among the Continental DX crew who look forward to "the good old DX days" revisited. All three are OTs; I1ER, especially, for Mario recently completed his 30th year as an ARRL member. (Photos via WØ1VFM)

AR (50) 0, TF3AB (50) 0, VSs 2EI (90) 16, 2EM (40) 16, 6DB (40) 15 and YU2JJ, VU2CY, ZC2PJ (45) 14 and ZM6AS escaped. . . . W4TBP, now at the 100-confirmed mark, associated with CP5EP (1) 20-21, EAs 8BII 9AP 19, 0AC 23, GC3EBK, HA5KBB, HZ1AB (40) 19-21, LZ1KAB (40-66) 19-21, OX3UD, Swede SL3AG 17, TF3MB, SP5AA 22, VQ4EM, ZB1AY 20, ZC41P, ZP9AU 1, 4X4s BX DC 23, FQ 22, 9S4BN, G3IRL who is *not* a YL and G13JM whose name is Jim. . . . GD3UB (32), MB9BJ (59), Y12AM (75), ZC4GF (35), 3V8SC (72) and 4X4BR swapped sigs with W1BFB. . . . FASRJ, HA5BL (20) 19-21, HK4BD, HR1MC (88) 3, IIBLF of Trieste, ZBITNE, 4X4s FS (45) 23, IE, 9S4s AX (51) 22 and BE (11-64) 12-20 brought KDSW to No. 51 and WAC. . . . W6NHF/4 caught CE7ZT, EAs 8BF (45) 18, 9DF of Rio de Oro, FM7WP, FY7YB (40) 23, HA5KBN, HZ1HZ, OQ3GU, SVLAB and VQ2HR with modest input

Fortunates who hooked ZD6BX recently are ET2PA 19, KC6GU, HK6AF 13, KR6s MC 13, OY, KT1EXO 17, MP4QAL (62) 16-20, SV0WZ 19, TF3AR 18, a UB5, VQ8CB (100) 12-17 of Chagos, VSs 1BJ 2EL 6CL 9GV 14-15, W4DGW/OQ5 9, W6JMX/KG6 13-14, XZ20M, ZB1s IRK BF 18 and ZD4BM 18. . . . ZC2BT took the measure of GC3KAV (52) 0, HA5BL (17) 16, JA6AO (45) 13, KASAB (33) 15, MP4JO (40) 20, SP8KAF (27) 19, VP5DC (10) 16 of Turks, VQ3FN (77) 23, YQ3GY (45) 22, 3V8AB (35) 21, 4X4s KC (80) 23 and FK (70) 23. . . . KR6OO, LX1RB, FG9AQ, ZD3A (61) 22 and ZP5GM got away from W1OJR, but HK6AI (190) 1, K2AKS (55) 12, VQ4FK (70) 6, GC LZ and OY customers didn't. . . . WSKAAT pinned down a Qatar MP4, LUSZS (76) 23 of So. Shetlands, ST2AR (55) 20 and ZB21 (60) 22 while friend W8APM, lately returned to the DX fold, practiced on an OY, FB8BB and VSAL. . . . W3TYW managed CN8AF (16), HA5BB (13), SPIKAA (16), TI2FCG (73) and a GC, LX1DU (42) and 0, HA5s BU (72). BW (40), KG1AA of Thule, VP5BM (10) of Turks, VQ4FM, ZP6CR and gadabout EL2X keyed with W4ZAE. One YZ1AZ. . . . "QSL via FB8CZ?" puzzles Mike. . . . FASBS JAs 3AB 15-16, 6AD 15, 9AA 15, PJ2CK 18, AE1UU 14 and YN1KK encountered W9VFM of Davenport.

. . . 14-Mc. c.w. doings at scattered shacks, first W1WAI: EA6, KT1UX (55) 23, YS10 (8) 0, YS6, ZP, W4GCB, CR6CW, PJ2s AE CC (80), SP, VP, W5AQ/2: SL7AG of the Swedish military, W6C4Y: DU7SV (89) 13, KAs 2FEC 2USA 9MF, KR6LX, YN1PM, W6IWZ (40), HK6, KA2MB, VP6RC, W6NTR: KC6AI (16) 3 of Uthiti, W6UED: KA3s MD 3, WL 3, KG6, VS6, K6AAJ (W6LDD): VS1EW (62), K6DVB: JA3AF, KR6USA, AE1OX, W7JLU: YN, ZP5AY, W8PCS: FG7XB (90) 22, SV, ZB2, W9EUV: BV1US, KA0JJ of Iwo, KC6CG, VQ6LQ, VU2As, W9KXK: EA9, FF8AJ, FG7, HK9, VP8AQ. . . . West Gulf DX Club DX Bulletin 20-meter code notes: AC4OK (6) 21-22, Cs 3AV (40) 21, 8GA (3) 0, CE7ZJ (22) 14, CRs 5AA (3) 21-22, 6CZ (46) 21, 8AB, DU1s GT (90) 13, SCS (82) 13, ETs 2AB (60) 1, 3GB (10) 18, 3S (12) 20, F9QV/FC (33-75) 18-1, FD8AB, FF8AP 8, FK8AH (62) 4, FY7YB (50-70) 23-0, GC2EFC (17) 13, HA2KTB (42) 19, Swiss military-bam station HB4FE (40) 17, HE9LAA (50) 21, HH3L (1) 21, IS1AHK (4) 17, IT1TAI (29) 22, JA6CA (42) 16, KG6AFX (119) 15, KJ6BB (38) 5, LZ1s KDP (57) 23, KSP (47) 17, MP4s KW NL, OYs 2A (30) 14, 2H (47) 12, 4A (35) 18, TFs 2WAB (38) 19, 5TP (41) 16-17, VKs 1VH 9WB (52) 13, VP8BB (82) 2, VQs 4AQ (18) 20, 8AG, VR3A (78) 6, VSs 2BJ (25) 14, 2EI, 5CT (87) 14, 6CT (70) 13-14, 6CW (120), YN1AA (18) 3, YOs 3RF (64) 20, 3ZR (64) 21, 4KCA (71) 18, ZCs 4GF (48) 21, one 6AA (59) 23, Z6J3U (87) 13, ZS3LD (62) 19-20, 3V8AN (64) 19, 4X4s GW (110) 19, GZ (86) 14 and II (77) 20. . . . YJ1DL (10) 6, HZ 1CC (75) 18 and M1H are in high demand.

**20** phone circumstances are equally DXhilarating. W1YOU needed only a TBS-50D (40 watts) to raise CS3AC of the Azores, FA3KC, FF8AP, GC6GF, GD6IA (153) 21, HH3DL, KS4AW, OD5AF, SV0WO, TF2WAF

(215) 21, ZB1JRK, 3V8AS (177) 18 and 4X4FK (130). A Telrex 2-el. spinner is no hindrance. . . . EA9AR (132) 12-23, FA3ZH 8, FR7ZA 6, I1BNU 9 of Trieste, VQ8CB 12 and a bunch of W/Ks came back to HZ1AB with little reluctance. . . . W8PCS knocked off VP1SD and YN4CB while awaiting his WASM award. . . . HZ1AB (328), KG1AA (202) 3 and KM6AX (250-275) 4 entered W9WHM's Indiana archives. . . . GC3EBK and the aforementioned HZ1 were welcomed by K2BZT. . . . TF2s WAG (130-160) 18-20, WAH and ZM6AT (140-160) 3-8 QSOd W1YWU. . . . KG6AK landed Formosa's BV1US (ex-AB1US) whose 100-watt frequently haunts 14,250 kc. . . . KL7FAF speaks of poor Alaskan 14-Mc. conditions in one breath and of QSOs with FA3GZ (121) 19, JA3HD, OD5AA (125) 21, TF2WAB, VQs 2DC 4FK (120) 22 and 5A2TZ (170) 14 in another. . . . VK4IC 7 of Willis Islet and VS5CT (130-190) 14-15 interested W6SYG. . . . AC4NC, CR5NC (161) 21, CT3AN (175) 21, DU7SV (193) 12, EA9AR (132) 23, ET2s XX (184), ZZ (145) 19, FF8AK (105) 15, IH6EC (175) 1, HK6AI (169) 1, KA0IJ (251) 7, KC6s CG (215) 13, UZ (237), K6IFR (245) 1 of Greenland, KJ6s AF (280) 13, AZ (227) 6, BG (225) 7, KM6AX (250) 4, KR6KS (279) 7, KX6s AF (285) 13, BU (230) 8-14, M1R (126) 18, MP4s OAI (200-205), OAM (150) 17, OK1MB (170) 0, OYs 3FF (110-160) 8, SML (160) 22, PX1YR, SP3WF (196) 21, SV0WM (100) 17, VL1VH (137) 7 of Macquarie, VK9s DB (124) 14, EB (122) 8, GV (143) 14, NF (183) 14, OK RH (122) 5, VP1OJF (177) 1, VQ4AQ (135) 19, VR2AP (170) 7, VS1s CZ (137) 15, FK (121-195) 15, FS (47-109) 14, VS2s BN 12, DB (170-190) 14-16, DN 11, DY (185) 17, DW (145) 15, GM 11, UW 11, VS6CL (156-174) 12-13, Y12AM (75) 19-20, YQ3GM (210) 21, YU1AD (165) 13-14, 457s ZD2s 2B (110) 21-22, 8AA, ZS2ML (165) 13-14, 457s EG 17-19, LB 17-19, MP (160) 13-14, 4X4s DK (159) 1, GB (120) 17, 9S4s AD (225) 22, HX (175) 20 and other A3 specimens are recorded by GDXC conferees. . . . *Network News* Radio Club tuners tuned in CN2AD (105) 20, CRs 4AF 16, 6AG 6BX, CT2AG (115), EAs 6AF (85) 20 of the Balearics, 8AI 8AF, 5, 8CB (230) 21, EL2X, ET2US 19, FAs 8BG 9WD 21, FM7, WZ 22, WF WQ, FQ8AK 22, FY7YE 22, GD3s IBO (120-255), UB (140), HB1MX (155), HH2RM, HH6CP, JA4BB, KA2AK (150) 18, 20J, 2SM (100) 23, 2YA (200) 22, 5MA 5SD, KC6AB, KG4AF, KR6AF, KTIWX, KV4s BB BD, MP4QAD 21, OASB (135) 0 in the Peruvian Amazon, OQ5s DX FA (125), RL TE, OX3AY (130), OY2Z, PJ2s AF (183) 18, AK AP CA, SP9KAL, SU1AS (130) 18, SV0WS, TA3US, TF3EA 14, TG9s MB RB (190), VK9FK 12, VP1s BS (192) PX, VP2s DC DL DN GW (155) 20, KM VA (190), VP3LF (195), VP7s NE NJ 21, NK (190) 2, NSNX, VP8s AQ BD, VQ2s DQ (120) DT 23, FU, VQ4s ERR EZ JB (135), MZ 20, RF SK, VU2AL 21, XZ2ST 14, YN1s RA WR, YS1s CB (290), MS, YV9AP (150) 21 in Venezuelan Amazon, ZBs 1CM (170) 1GBF, 2A (110), ZDs 3BFC 18, 4BF 22, ZM6AT 4, ZP5s CG 1B, ZS3AH, 3V8s AP CS, 4X410 (240) 5As 2CL (150) 19, 4TU (120) 13 and several 9S4s. . . . Here's a good spot to remind you single-sideband specialists that "How's DX?" is for you birds, too. QTC? QRV?

**40** c.w. keeps a flock of DXers happy. W7JLU had a ball with DU1SCS (20), KG1AA (15), KR6LJ (20), OX3AY (25), VK9PF (35), VS6CQ (1) and one ZL1A. . . . VS7ZE, HIR1JZ, KC6CG, KR6KS, KV4AA, VP7NM, VSZAE, a pile of VKs and JAs tried out G6EBB's 811. Don reports JA3 ISR and 7B0 as having standout signals among thirty Japanese nationals logged. . . . From the other end of the country W3WPG suggests EAs 6AF 9AP, FASDA, OE13USA, VQ5EL and 9S4CH, reaching 77/66 with an 813 final coming up. . . . It's 106/88 for W1WAI, in part because of IT1TAI (5) 1, TI2CAH (1) 1, VPJs 2SH (22) 0 and 6RG (40) 0. . . . DU7SV, JA1AJN, VKs and ZLs in number conversed with W5CAV. . . . The ground-plane and 150 watts of W5WZQ flagged down EA9DF JZ0DN, KC6 KR6, VP6 6GC 7NX,



ZS3HX, as well as JAs 1GS 1NI 2LC 3AF 5AB 6FC and 8AI. Those Japanese DX men really get around in quantity on 40! W9VBS found a plains QTH good for HK4DP, KG4AV, TI2s BX PZ, VP7a NG NM, ZL1BY and a helping of KH6s. . . . Now a perambulating perusal of 7-Mc. c.w. doings hither and yon, at K2DSW: KH6, OE, ZL, K2JWZ (now K2JWZ): KV4BK, K2JZR: IT1, YS10, YU3s ABC AJK DJK, K2JKC: KV4, OE, K2JAN: CT3AB, Europeans, WN3ZUH: KH6AUJ, W1TFB: KG1, VKs, YU2AE 2, LUSZC 7, K6ENX: F9QP on ship off F18, JZP, KR6, ZEGJF (30) 4-5, ZSs, W7VWS: JA1VP (40) 16 who switches to 'phone during c.w. QSOs, KH6 KL7a AQU AZI BAK BK1, W0UOL: KG1, LU, PJ2AE (50) 7-8, PY, VK7, DL4ZC: Ws 1ADM 2TQC 3VAN 4UXI 6VUP 8GMD, ZD6BX: long-path W6s, W7s, ZS7D 16, HK4ZCers: FG7XB (32) 15-16, VK9RH of Norfolk, and ZD2WAF (ex-ZD9AA) 0.

**40 'phone**, as a DX band, leaves much to be desired. So, having made the understatement of the year, let's see what NNRC's redoubtable eavesdropper uncovered in the way of 7-Mc. A3 DX: F08AQ, HP3FL, HR1BG, JAs 1AEV 1DG 3BU 3KE 3MB 4XF 6BL, KH6s in quantity, KV4AQ, VKs 6MO 9RM, VPs 1LJF 3HAG 6WR 7NY, XZ2OM, YS1MS, ZS6AR and enough Australian and New Zealand stations to run you out of QSL cards. . . . Attention is called to the fact that 40-meter 'phone suballocations are quite various around the globe (e.g., check KC6AA's "Whence" comments to follow). You don't just tune off the low edge of the FCC-specified Yank 'phone band and expect to log the world. For the general pattern of world-wide amateur band suballocations, including 7-Mc. 'phone, we refer you to the full-page chart in the current edition of ARRL's invaluable *License Manual*.

**80 c.w.** and its kin 160 have, for most practical DX purposes, been given back to the Indians, traffic men and rag-chewers for the summer. Eighty always dies hard, though, and W7JLU latched onto JA7BO, KG6GX on voice, KM6AX, KZ5DE, ship SM8CWC, VK9RH (12), VP7NX, VS6CQ (3), W6TMY/KG6, YV5BJ (9) and ZK1BG (18). . . . K2HZR found the European path still open for EIs and PA0s, while friend K2JKC bumped into KV4BK. . . . DL4ZC reports QSOing big signals from Ws 1WLW 2GGL 3AXT and 4KVX through the rash of static crashes.

**15 'phone** comes next on this month's Bandwagon and W4NQM gives our vehicle a good push with CE3II, CN8CS, CP5EQ, CRs 4A1 6BH, CX5AF, EA9AZ, FAs 30A 8RJ 9ML, HII2W, HK4DF, HRIKS, KT1a ENO WX, OK1KAI, OOs 5CJ 0DZ, SV0WO, TA3US, VOs 4EU 4EZ 4RF 5EK, YN4CB, YS1RA, YU1GM, ZB1JRK, ZP5AM, 4X4s DK and FQ to reach 85 countries on 21-Mc. A3. Sparky also worked acads of Europeans, ZSs and Oceanians—few dull moments these days on fifteen! . . . W4WVM clicked with 57 ARRL DXCC Countries List items in just four months with 30 watts: a CR4, EL2X, VP7NG, YV5EW, ZL3FP and a 4X4 assisted. . . . Fifteen's faithful W6ZZ reports an entertaining mixture of short and long skip, the latter helpful toward KH6s AFS AIW BIM ZA, KV4BD, KZ5s a-plenty, OA4M, TI2RX, VP6FR, XE1OE, ZLs 1BY 2AJB 2AX 2SO, maritime-mobiles operated by Ws 1KS 2WAT 3OZA and 5EWS. Miles, ex-W1WV, now is 68 years young, a credit to ham radio for many years. . . . EL12A, OA3L, OQ5RU, PJ2AR, VP6GN, VQ4EZ and other catches swell the records at W4UWC. . . . W6NJU collected a CPe5,

HR1, TI2, VP1, VKs galore, VP7 and YS1RA (250) 21 but 21-Mc. voices. FAs 3JY 9VN, HC1s GE WG, HP1FS, KG4AG, KV4BB, KW6BB, MP4NL, OA5G, OQ5AI, PJ2s AP CD, SV1SP, VPs 2AD 4LL, VQ4ERR, YV5EC, ZBs 1AUV 2A, ZD2FHW, ZP5IB, ZS3G and 4X4BG are accounted for by NNRC informants.

**15 c.w.** gets short shrift now while DX comes so easy via radiotelephone. W1CTW soaked up EA0AC and SV1AB around suppertime to make it 68 21-Mc. code countries. Cal also corralled Ws SHZA (W. Va.) and 9TJG (Wie.) to close out his 15-meter c.w. WAS. . . . Novice DXer WN4GSM traded RSTs with CN8AF, Fs 3AT 9VK, FASRJ, G3AET, KZ5LB, LU9DAZ, PY7DN, VP9BL and ZB1AY. Terry's Virginia 30-watter holds its own with the Generals any old day.

**10 'phone** now delights the short-skip gang mainly but there are DXers hereabouts poking through the E<sub>s</sub> successfully. Scattered 10-'phone reports, thanks to W4NQM—K24JN: CX6BBM, LU3AY, K24JD: CX4AB, HC6KI, HR4WH, LU8s DDI EJ, TI3LA, K2FFB: CX2s BP GE, PJ2AP, WZ2AS: TI3LA, W6ESE: HP4FL, LU8 3AAT 5DC, W3POG: LU8, PJ2, W5V5U: PJ2AG, YV1AU, W6CNY: CE2BQ, CXs 3BT 4CS, LU8 1CM, 2DA 2DED 5DBN 6EX 8AM 9DBA, OA5G and PJ2AO. . . . CR6BX and ZS6ZK spoke with W1YWW, and we note that W9RVB's 65-watter and 3-el. c.s. rotary are close to the 1955 10-meter 20-country mark. . . . HP2TP partakes of 2S-Mc. c.w. sport—rare sport, indeed—encountering K24JD and W3HTF thereby. On which weird note we leap off the Bandwagon for this month and peek into the postbox to see what's cookin' in the QTH department. . . .

## Where:

From ubiquitous Bob Roberts, G2RO: "I have just completed my last and longest tour of this series and cards have been ordered from the printer. Everybody contacted will get one in due course. Calls covered are VR1RO, VR2RO, VL0RO (Nauru), VR4RO, VQ8AY and ZC4RO. It may be worth mentioning that VQ8AY is my own issued call and not a borrowed one as some have thought. Authorities could not give me VQ8RO. . . . VU2JP gives assurance that QSLs bound for VU AC3 and AC4 areas will be relayed via Box 1, Munnar, Travancore, India, as usual even when he's traveling or on U.K. furlough in Scottish highlands. . . . Regarding the VPIGG address run last month, QSLs will be held by VR2AS pending ex-VPIGG's arrival in Fiji after completing leave in the British Isles. . . . We learn from W6LTY that VK9DB assumes manership of Papua Territory QSL matters now that VK9GW has returned to New South Wales. . . . "The MARTS QSL bureau has been extended to include the areas of VS1 VS2 VS4 VS5 ZC2 ZC3 and ZC5. Anyone wishing to QSL amateurs in these areas should send cards to MARTS QSL Manager, P. O. Box 600, Penang, Malaysia." This info from K6GAK after a recent QSO with VS2DQ. . . . W1YOU correctly believes we should reaffirm here that a QSL card *not* enclosed in an envelope now can be sent anywhere in the world via air mail for ten (10) cents—provided it is no smaller than 2¼ by 4 inches and no larger than 3¼ by 5¼ inches. . . . ZD4BT, via W1WPO, asserts that quite a few incoming QSLs have gone astray and suggests that amateurs whose return ZD4BT pasteboards are long overdue reply to the corrected address that follows. . . . Don't fret and fume if you lack the QTHs of any KC6s you

For our QTH of the Month we present the back yard of OE5AH at Drachenwand u. Plomburg, Mondsee, Austria. This Gibraltar-like "Wall of the Dragon" blocks off OE5AH to the west—"No South American stations heard here since 1953." OE5AH is operated by Austrian Archduke Anton Habsburg, better known to prewar DX hounds as OE3AH. Anton is quite active again with p.p. 807s driven by an IIT-18, and HRO.



work. KC6AA reiterates: "Any and all KC6 QSLs can be sent through me." . . . . . Although VR3A is to remain active on Fanning until the fall he requests that, as of now, QSLs for him be mailed to the Australian QTH to follow . . . . . Reminder: In our monthly address rosters, such as the one to follow, we strive not to duplicate QTHs available in the latest *Call Book*. Also, addresses that are at variance with W9TRD's listings for identical stations do not necessarily indicate either "How a" or the *Call Book* to be in error. This is because DX stations often adopt box numbers, etc., to facilitate collection of mail while their station-location addresses continue usable. W1s JLN SSZ UED WPR ZDP, K2GMO, W4NQM, W5WZQ, W6s LDJ NIF/4 NTR, K6a AAJ ENX GAK, W7JLU, W8LMO, W9a CFT EU FGX RMH, W0s CPM QGI VBS, VS2DB, ZD6BX, NCDXC, NNRC, SCDXC, WGDXC and member societies of the International Amateur Radio Union unearthed these individual items for you:

BVIUS, MAAG, Formosa, APO 63, San Francisco, Calif. . . . . C8GA, Box 55, Peiping, China . . . . . CE2AN, Casilla 3016, Valparaiso, Chile . . . . . CM6FA, F. J. Fernandez Amador, Box 38, Fomento, L. V., Cuba . . . . . ex-CP5AB (QSL to HCIES) . . . . . CR7FM, F. F. Morgado, Malema, Niassa, Mozambique . . . . . CR7HF, Hugo Felizardo, Caixa Postal 13, Chinde, Zambesi, Mozambique . . . . . CR7MG, M. A. Morgado, Alto-Moloeue, Quelimane, Mozambique . . . . . CR9AI, Jose Maria, Box 28, Macao . . . . . DL2XZ, QSL to J. Martin, G3JVC, 23 Aldensley Road, Hammersmith, London W. 6, England . . . . . EA5DT, Box 999, Valencia, Spain . . . . . EA8BS, J. M. de R. Perez, Calle Ripocha 22, bjo. decha, Las Palmas de Gran Canaria, Canary Islands . . . . . EI3AB, Lt. R. P. Gower, Naval Vol. Res. Radio Club, Cathal Brugha Barracks, Rathmines, Dublin, Eire . . . . . FB8BN, Box 806, Tananarive, Madagascar . . . . . FO8AL, Tubual Island via Tahiti . . . . . HI8EW (QSL via W4QV) . . . . . KA2RP (QSL via FEARL) . . . . . KA5MH, APO 950, San Francisco, Calif. . . . . KA7GB, APO 45, San Francisco, Calif. . . . . KC6AI, Richard Kohler (W6MFF), USCG Depot, Box 3, Navy 926, San Francisco, Calif. . . . . KG1AA, APO 23, New York, N. Y. . . . . KG6AFT, William Jones, P. O. Box 97, c/o CAA, Agana, Guam . . . . . KG6SB, P. O. Box 14, Navy 935, FPO, San Francisco, Calif. . . . . KJ6BG, Kirk, APO 105, San Francisco, Calif. . . . . KJ6BH, APO 105, San Francisco, Calif. . . . . KL7BFT, Lt. Cmdr. G. R. Maxwell, USN, Navy 127, Box 14, FPO, Seattle, Wash. . . . . ex-KL7JE (QSL to KW6AT) . . . . . LU7MAR, Casilla Corroero 345, Mendoza, Mendoza, Argentina . . . . . ex-MI3TM (QSL to VQ4EG) . . . . . MP4JO (QSL via W2PCI) . . . . . MP4QAM, N. J. Clarke, c/o Helljford, Dubai, Trucial Oman, Persian Gulf . . . . . OA3L, Roy Letourneau, Tournavista, Peru . . . . . OY2S, Svend Poulsen, Box 27, Thorshavn, Faeroes Islands . . . . . OY7ML, M. Haasen, P. O. Box 141, Thorshavn, Faeroes Islands . . . . . ex-PA0YX (QSL to VK3AIW) . . . . . PY8NN, Box 96, San Luis, Maranhao, Brazil . . . . . ex-ST2NW, C. N. Webber, International Aeradio, Ltd., c/o P. M. G., Kuching, Sarawak, via Singapore, Malaya . . . . . TF2WAB, Reykjavik Airport, Reykjavik, Iceland . . . . . TF2WAF, 1971st AACSS Sqn., APO 81, New York, N. Y. . . . . TF2WAG, 932nd AC&W Sqn., APO 81, New York, N. Y. . . . . UD6KAD, P. O. Box 73, Baku, Azerbaijan, U. S. S. R. . . . . VP1FL, Frank Locke, Telecommunications Department, Belize, British Honduras . . . . . VP5BM, QSL to W5HUI/4, Route 1, Box 53E, Bay Minette, Ala. . . . . VP5DC (QSL to W4NMO) . . . . . ex-VQ2JO, VQ4MNS-ZE2JO, M. Salmon, G2CKM, Hastings House, Ledsham, So. Milford near Leeds, England . . . . . VQ3CF, Box 35, Songea, Tanganyika . . . . . VQ4AQ (QSL via W4PDZ) . . . . . VR3A, Ray Baty, 79 Bealiba Rd., So.

Caulfield, S. E., Victoria, Australia . . . . . VR4SWL, P. O. Box 47, Guadalcanal, Solomon Islands . . . . . VS1EW, P. O. Box 1158, Singapore, Malaya . . . . . VS2EM (QSL via MARTS) . . . . . VS5CT (QSL via MARTS) . . . . . VS6DB (QSL via HKARTS) . . . . . VU2AS, Capt. P. A. McGrath, ESD Panagar, P. O. Arjunpur, Dist. Burdwan, West Bengal, India . . . . . XE1PAZ (QSL to W0UUE) . . . . . YJ1DL, D. E. Laing, ex-VK2DE-ZC3AB, Port Vila, New Hebrides . . . . . YS1ZG, U. S. Embassy, San Salvador, El Salvador . . . . . ZB1AJX, G. Stanton, 5 Mifsud Flats, Paceville, Malta . . . . . ex-ZC1AL (QSL to VS2DQ) . . . . . ZD4BT, S. Browne, Eastern Radio District, Dept. of P&T, Accra, Gold Coast, Br. W. Afr. . . . . ZK2AD (QSL via ZL1DA) . . . . . ZS7D, Creon Cloete, P. O. Emlembe, Swaziland, So. Afr. . . . . 3A2AM (QSL via G6LX)

## Whence:

Asia — Because Afghanistan remains on the rarer side these words from W9ERC in Kabul should be of interest: "In the present [new] QTH there'll be room for a 7-wavelength beam on 20; but, if anything at all, I'll have only about 10 watts to a 6V6." That will be all he'll need! "We're expecting a couple of Globe Scouts at Afghan Institute of Technology and, since I'm teaching a radio course this year, we will have them on the air quite a bit. The fellows know no code so we'll be on 'phone.' The time appears to be approaching when YAs will be available in number . . . . . W9EU was the first W contacted by VU2AS who likes 20 c.w. with an 807, BC-348 and dipole . . . . . W1YOU notes that OD5AF-MP4QAJ signs G3HEH when in England . . . . . MP4QAL tried low-level modulation on his 120-watt 807s rig "with horrible results." He has a ground-plane, a 300-foot long-wire, an Eddystone receiver and likes most of all to work his pals back home around Dublin town . . . . . W1YEH, just back from Japan, left W1TTA in charge of the KA8AB BC-610E, W5A-3 and 3-element rotary on 20. W4LPI is quite active as KA2DC . . . . . W6CRV, who leaves HZ1AB next month, bears down on the 100-country mark in his Saudi Arabian efforts. Surprisingly solid openings to W6 and W7 spiced up Ron's recent activity. "QSL situation still rough — the 300 from OE13USA are gone now; 900 [from the States] still have not arrived. I Mimeographed 100 but they are pretty sloppy. Sending them out, anyway." . . . . . We also hear from W7YBI/0, one of HZ1AB's former operators, who was delighted to note that "Hot-Ziggity-One-Affectionate-Bachelor" still cracks away at 14 Mc. Other HZ1AB ex-ops, W9ERG and W3ZCG/5, are attending Purdue U. and serving with the USAF at Keeler AFB, respectively. W7YBI/0 regularly operates K9FDV and has applied for his own W7 ticket in anticipation of a future North Dakota-style DXCC . . . . . The Massachusetts OD5 who specializes in baiting W5s is closer to the end of his rope than he realizes, says W1SSZ . . . . . From VS2DQ via K6GAK: VS5CT has ordered QSLs but is deep in the Brunei jungle with an oil exploration party. He will QSL 100 per cent but doesn't expect to be shipping out cards in quantity until late this month . . . . . FEARL (U. S. nationals in Japan) contemplates a KA DX contest to be scheduled for August or September. It will be a single week-end affair and we'll pass along the dates as soon as they are selected . . . . . 4S7LB, off the air awhile rebuilding, tells W6RW that CR8 activity is becoming noticeably less frequent.

Africa — ZD6BX now is up to 131 worked "in spite of poor conditions. ZD6EF runs 100 watts to a long-wire, mainly on 20 c.w. at present." . . . . . "Please cancel all rumors of VQ4NZK as VQ9, Seychelles, Geo. still is in Kenya

The city of Damascus, believed to be the oldest continuously-existing community in the world, turns out to be a pretty fair radio QTH as verified by the 'phone signal of YK1AA.



Radiotelephone work is preferred by 3V8AS. Alfred's equipment is homespun for the most part and his Bizerte station now is a North Africa landmark on the twenty-meter band. (Photo via W1WPO)

EA9DF is kept very busy representing the Spanish Africa territory of Rio de Oro on DX bands. Cesar does a fine job with the 50-100-watt 'phone-c.w. rig at left. A scrupulous QSL policy is maintained at EA9DF. (Photo via W1WPR)



and is very busy making movies." This from VQ4ERR who promises there'll be ample warning when and if VQ9NZK fires up. . . . . ZS5JY doesn't expect to raise his much-publicized tower for a year or so, according to W4NQM. Don't forget to add "Natal" to the ZS5JY QTH appearing in the *Call Book*. . . . . Mozambique amateurs now number some 70 strong. CR7s AC AE AI AK AZ BL BN CV CY DA DC DG DM DI DK DL DN DO DR FM HG and MG are among new licenses reported by IREM. . . . . The South Africa city of Pretoria celebrates its 100th anniversary this year. SARL secretary ZS6AMO writes: "To mark the occasion, members of the Pretoria branch of the South African Radio League have prepared special QSL cards to be issued in addition to their regular cards." So, for a collectors' item, go raise yourself a Pretoria ZS6 at once. . . . . "VQ3EO is off the air. I will probably be VQ4EO during May and June. Many thanks to the 1300 U. S. stations — particularly W1JNV — who helped me spend the long evenings in the bush." Ex-VQ3EO, who still has a stock of Tanganyika pasteboards on hand, can be reached care of Macalder Nyanza Mines, Private Bag, Kisumu, Kenya.

**Oceania** — From KC6AA of Yap, Western Carolines: "Would like to remind the DX gang that KC6 stations do not work the same frequencies on 40 that Stateside DXers work. Our 40-meter band is 7000-7150 kc., 7100-7150 kc. for 'phone. I work 40 almost exclusively and always tune the Stateside 'phone band when working 'phone. KC6AA can be found almost nightly on 7116 kc." The areas compassed by the Eastern vs. Western Carolines are somewhat tricky to determine. The Eastern Carolines appear as just "Caro-lines" on most maps and this may account for the difficulty. Knowing that Truk, Ponape and Kusaie are in the Eastern Carolines, and that the Palaus, Ulithi and Yap are in the Western group should help keep the bearings straight. . . . . W6NTR finds that KC6CG on Ulithi is W6MFF in rare-DX clothing. KC6CG has a Viking II at the input end of a 14-Mc. ground-plane. . . . . DXers of several continents are busily persuading YJ1DL to forsake 40 for 20 meters. . . . . KC6s ZB and ZC take a dim view of KC6HX or KC6SDX on "Mays Island". . . . . W5LCI, who recently wangled a VR6AA QSL for a 1947 'phone QSO, advises that VR6AC has a new receiver and hopes to be working 20, 15 and 10 meters in the near future. W5LCI's Pitcairn confirmation finally came about through correspondence resulting from Jim's recent contact with a bogus VR6AC on 14 Mc. This time it paid to work a phony!

**Europe** — The experience of HB1MX points up why DX stations rarely QSL first these days. Kurt's Liechtenstein operation resulted in nearly 2000 QSOs with 91 countries, 852 contacts with the U. S. A. Only one out of every ten U. S. stations bothered to answer his cards and just three out of every ten non-U. S. stations replied, according to F7ER. . . . . "Present 3A2 activity is entirely confined to local 'phone work. The only DX activity from Monaco occurs when some DXpedition-type station gets on the air there. Such activity is usually announced in advance through proper channels. Ergo, any 3A2 activity (particularly on c.w.) that pops up unannounced should be viewed with dark suspicion, to say the least." These words from OT DXpediter W6SAI-FP8AC-3A2AF-7B4QF who noted that his 3A2AF call recently was borrowed for 14-Mc. use by some unscrupulous individual. Bill adds, "Come the peak of the sunspot cycle, I hope to polish off some spots like 3A2 PX and HV to everyone's satisfaction. As you know, the main requirement for a DXpeditionary man is a strong back and a weak mind." . . . . . Two-letter Irish calls become reality with the licensing of EI3 2AB and 3AB. . . . . EI6U and TF5TP scored the first EI-7F 80-meter

QSO in history. Icelandic amateurs are authorized to employ 3.5 Mc. this year and from now on, so there's another multiplier available for the annual ARRL DX Tests. . . . . W6RW received a reception verification from Albania's *Radio Tirana* in response to his QSL to ZA1BB. . . . . A flyer bearing a list of British Commonwealth and Colonial Empire call areas, plus descriptions of RSGB operating awards based thereon, now is available from RSGB Hq. and should quickly answer general inquiries concerning WBE, BERTA, et al. . . . . W1BB's *160-Meter Test Bulletin* tells how YU1GM's 80-meter folded-dipole collapsed and threw a good chunk of Belgrade into darkness by shorting power lines. . . . . DXers of the old school will be glad to hear that DARC (Germany) is reviving an old top-favorite DX contest — the annual DJDC. It will be known instead as the WAE DX Test and is tentatively scheduled for September 17th-18th (c.w.) and September 24th-25th (phone).

**South America** — From HC1ES, ex-CP5AB: "I have started operating on 21 and 14 Mc. and will shortly be active on all bands, 28 through 3.5 Mc. My previous call, CP5AB, has been cancelled but I still retain my Argentine call, LU9DBF." The new HC1ES uses a BW-5100, a 75A-2 and folded dipole antennae. . . . . FM7WN won't be back from France until September and FY7YZ is n.g., according to FY7YE. . . . . W6NIF/4 points out that the LUSABL 400-watter needs only Nevada to complete a 14-Mc. c.w. WAS. . . . . In the *Circular Letter*, the G2DPY-edited organ of the First Class Operators Club, we see that well-known DXer G5RV soon will commence a three-year South American hitch as YV5RV. . . . . Argentine Antarctica QTILs courtesy SCDXC's *Bulletin*: LU "Z" calls ending in A G and M are on South Orkneys (Laurie Island base); C I O S T on South Shetlands (Deception Island and Bahia Luna bases); and B D E F H J N P Q U V on Grahamland, Antarctica proper (Bahia Esperanza, General San Martin, Almirante Brown and Melchior bases).

**Hereabouts** — VP4BN's DX career goes 'way back through these calls: Ws 3JMG 4RHC 6BRZ 6TPKC, KZ25NA, KA1BN, XU5 1BN and 8BN. . . . . W6NIF/4 terms Florida a DX paradise in spades — Al picked up 85 countries in less than three months with 35 watts. He hopes to land a short tour of Grand Turk or Caicos duty before heading back west. . . . . Potomac Valley Radio Club efforts lead by W3JTK, W3RXD and W3VOS sent off 728 HK0AI QSLs via bureau channels. — *W1ZDP*. "Believe it or not, I prefer to be 'just another W'! All joking aside, it's nice to be back home and I still enjoy the thrill of competition." This from indefatigable DX hound W4VE, ex-KR6AA-KA9AA. . . . . HR4WH, licensed in October of last year, already has built up an excellent reputation in the QSL department and is rolling up quite a DX tally of his own. . . . . DX stations needing South Carolina are invited to set up 20-c.w. skeds with W4GCB. . . . . Iowan W9QGI reports confirming 100 ARRL DXCC Countries List items worked with a 2E26 at 30 watts. . . . . From W8LMO: "VP5AE has gone QRT and I am returning to the States for reassignment. The Turks and Caicos continue well represented on the ham bands by VP5s BM and DC. Anyone who did not receive his VP5AE card should QSL to W8LMO's home QTH." . . . . . W8s must be succumbing to conscience: K6ENX finally received a W8BHW QSL confirming their 7-Mc. QSO in 1940 when they were XUSM1 and W2BHW, respectively. W8BTI, another Ohio DX-deliver, just got around to answering the 1941 QSL of W9BRD. [One less state to go for WAS, Boaz! — *Jeeves*]. . . . . W2QHJ obtained his 100-meter WAS endorsement from Hq. to batten down his claim to the first and only six-band Worked All States certificate on record.

## New Apparatus

### The Model 587 Audio Bandpass Filter

NUMEROUS ARTICLES in *QST* and other publications have pointed out during past years the advantages of restricting the speech range of a phone transmitter. On a.m., reducing some of the low-frequency response can save modulator power and actually add to intelligibility. In s.s.b. rigs, restricting the audio range "protects" the audio phase-shift network and results in better side-band suppression, and it eases the burden on an exciter using a filter. A number of designs in the past have shown a filter or other device for restricting the audio range of a speech amplifier for the reasons outlined above.

The operator who has always wanted to try an audio filter but is reluctant to dig into the rig to install it will be interested in the Model 587 Audio Bandpass Filter. This small unit is designed to go in the microphone cable between microphone and transmitter, so no work is involved outside of making the connections. The input side of the filter has an Amphenol microphone jack that takes the usual connector, and the output side is a 5½-inch length of microphone cable terminated in a microphone plug. The only time you might have to modify anything is when your transmitter is fitted with something other than the Amphenol microphone jack, but even then it is easy to rig up an adaptor.

The filter itself is housed in a 1¼-inch diameter metal tube 4 inches long, so it doesn't take up much room on the operating desk. It is designed to work only with crystal microphones, and because such microphones represent practically a pure reactance, the filter has practically no insertion loss. This means that if the gain of your speech amplifier is marginal you can still use the filter without cutting down your modulation. Although different microphones vary slightly in their output capacitance, the manufacturer's tests show that the extremes of this range result in only about 100 cycles difference in the low-frequency cut-off point. The manufacturer's response curve of the filter indicates the response to be down 3 db. at 450 and 3300 cycles, and 20 db. down at 210 and 7300 cycles.

But a coldly scientific response curve doesn't give the whole story, and we thought that many readers would be interested in what the filter does to speech. The best test we could think of along these lines was to use the filter in the microphone lead feeding a "medium hi-fi" unit, switching the filter in and out as a number of office guinea pigs took turns speaking into the microphone. This was considered to be a better test than modulating a transmitter and listening on a receiver, since it eliminated the bandpass effects of the receiver and the possible distortion in both transmitter and receiver. The results were rather interesting, we thought. In most cases, observers reported no significant change in the voice characteristics. However, on two voices

(one male, one female) it did change the voice characteristic noticeably — observers agreed that these were "high-pitched" voices. The consensus was that the filter has good "balance" for most voices, but there will be a few where the use of the filter will change the voice characteristic. Since this is bound to occur with any fixed filter design, it would appear that the manufacturer has made a very good choice.

The Model 587 Audio Bandpass Filter is manufactured by the R. L. Drake Company.

## A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

- W1, K1 — J. R. Baker, jr., W1JOJ, Box 232, Ipswich, Mass.  
W2, K2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.  
W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.  
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.  
W5, K5 — Oren B. Gambill, W5WI, 2514 N. Garrison, Tulsa 6, Okla.  
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.  
W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.  
W8, K8 — Walter E. Musgrave, W8NGW, 1294 E. 188th St., Cleveland 10, Ohio.  
W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wisc.  
W0, K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.  
VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.  
VE2 — Harry J. Mabson, VE2APH, 122 Regent Ave., Beaconsfield West, Que.  
VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.  
VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.  
VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.  
VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.  
VE7 — H. R. Hough, VE7HR, 2316 Trent St., Victoria, B. C.  
VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.  
VO — Ernest Ash, VO1A, P. O. Box 8, St. John's, Newfoundland.  
KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.  
KH6 — Andy H. Fuchikami, KH6BA, 2543 Namaau Dr., Honolulu, T. H.  
KL7 — Box 73, Douglas, Alaska.  
KZ5 — Gilbert C. Foster, KZ5GF, Box 407, Balboa, C. Z.

## Strays

W9HCN's address has been changed three times in the last three months, but he hasn't moved. Seems he was caught in the middle of a post office redistricting.



CONDUCTED BY EDWARD P. TILTON, W1HDQ

**W**E'VE tried v.h.f. here, but it just doesn't work!"

Over the past twenty years or so we've heard this lament from just about every section of the country, including areas that eventually proved to be prize v.h.f. locations. How is it that so many hams, some of them in spots that could hardly have been more favorable, have come to the conclusion that they could not do interesting work on the frequencies above 50 Mc.?

Some have made their initial efforts with ineffective gear, certainly. You wouldn't expect to set any of our lower frequencies on fire with 10 watts, a broadband receiver and a small antenna. Why "try v.h.f." with such a set-up? Sure, low power and simple gear work well enough if you have plenty of near-by activity, but if you're going for extended ranges you'll need the best gear obtainable. A good big antenna, a low-noise receiver and good stability and selectivity are musts. High power pays off handsomely, too.

But alert operating is even more important. Most of the trouble, we think, has been lack of knowledge of what to expect, and when to expect it, and too few stations within the possible working range. Coordination of operating schedules can be mighty important. The best location in the world will produce a complete blank, if there is nobody on the air in the territory you're scanning with your beam. Countless opportunities for v.h.f. DX are missed in this way.

Take the Gulf States, for example. There is plenty of evidence that from Florida around to Texas, and up the Atlantic Seaboard to the north, too, tropospheric propagation on the frequencies above 50 Mc. is good more often than almost anywhere else in the United States, yet tropospheric DX on the amateur v.h.f. bands is still a rarity over these routes.

Early in May your conductor visited radio clubs in several Florida cities, and met with similar groups in Georgia and North and South Carolina. All along the line we found evidence of increasing v.h.f. interest. Getting going on 144 Mc., particularly, was a major objective. Before we arrived back in West Hartford 2-meter DX had already been heard or worked over several

southern paths that had never been spanned before, and new southern states should be showing in the "worked" totals of W1s, 2s, and 3s, as they already have appeared in the records of Texas, Louisiana and Mississippi W5s.

Here are some reports that indicate the possibilities. W4UUF, Pensacola, Fla., who got on 144 Mc. through the efforts of W5RCI last summer, has been working Texas stations frequently since the middle of March. W5FEK, Houston, says that W4UUF has hit S9-plus levels on several occasions, and has been heard working stations at 500 to 600 miles as fast as he could turn from one to another. We'll bet that Tampa to Houston, 800 miles, could have been worked almost as readily.

From Orlando, W4CSS writes that he and W4MSX and W4QN have heard W4UUF. This is an all-Florida circuit of some 400 miles that almost certainly could have included Jacksonville, Miami and other Florida cities, too. Just after midnight, May 8th, W4QN heard W4SMA, Whiteville, N. C., for more than an hour, but could not raise him. This is a 450-mile over-water path that is probably close to ideal for v.h.f. work. We suspect that Norfolk, Baltimore, or even Philadelphia might be worked from Florida points now and then, too. To aid in establishing contact with distant points, Orlando stations aim their antennas on the following

Don Goshay, president of the 2 Meter and Down Club of Los Angeles, shows some of the 1215-Mc. gear exhibited at a recent meeting of the club during which this band was featured. Numbered items are described in the text.



schedule, transmitting and listening for DX: 2045 EST — Miami area; 2100 — local check, beamed on Gainesville or Tampa; 2115 — Pensacola; 2130 — Tampa; 2145 — various directions, depending on conditions observed during above checks.

Activity on 144 Mc. in North Carolina has been coming along well in recent months. Our meeting in Raleigh was attended by an enthusiastic band of 2-meter men who are working the band for all it's worth, several of them in locations that should be hot spots for 2-meter DX. W4MDA, Wilmington, N. C., has since written that on the night of May 10th, while W4MDA was at work, K4CTW picked up a weak signal

with his beam north. Peaking the beam position indicated that the signal was from the south, and further listening showed it to be W4GGO in Miami! He was in contact with several locals, and the following were identified: W4UIW, Hialeah; W4UTJ, location unknown; and W4JZB, Hollywood. The path from Wilmington to Florida East Coast cities is entirely over water. Though it's some 600 miles to Miami, we think the hop might be made quite often on 144 Mc.

W4CVQ, Raleigh, and W4MDA and W4SMA demonstrated their ability to work north on the night of May 3rd, and into the following morning, contacting innumerable W1s, 2s and 3s on 144 Mc. The best DX we've heard of as the result of this night's work is W4MDA to W1JSM, Waltham, Mass., close to 700 miles. As signals were good over this path it is obvious that longer distances await only the appearance of stations on 144 Mc. in South Carolina and Georgia.

From now on through the summer and fall months there will be many opportunities for work over distances of 1000 miles or more on 144 Mc. and possibly higher bands. The 50-Mc. band will be open for hops up to at least 2500 miles during the early summer. The Atlantic Seaboard and the Gulf Coast are only two of the many paths where such work will be possible. The Pacific Coast, from San Diego to Seattle, should be included in the potential DX paths for 144 Mc. We know that the vast Middle West can be crossed in any direction by 2-meter signals, and even the highest mountains and roughest terrain can be covered under certain conditions. Whether or not we work DX on the v.h.f. bands this summer depends far less on the character of our locations than on whether there is activity in the right places, at the right times, with the right kind of equipment. If we take maximum advantage of the breaks that Nature will provide, there should be many new states worked on 50 and 144 Mc. and new DX records on 220 and 420 Mc. to report before the end of 1955.

### Here and There on the V.H.F. Bands

The best 432-Mc. DX so far reported in 1955 was worked April 30th by W3BSV, Salisbury, Md., and W1OOP, Needham, Mass. This 365-mile contact, at 2205 EST, was made with good signals both ways, indicating that if the 432-Mc. enthusiasts around Norfolk, Va., had been on hand a new record might have been set.

The night of May 3rd was a big one for VE1QZ, Dartmouth, N. S. Beginning about 2120 EST, Oscar heard 144-Mc. DX signals, and between then and 0032 EST he worked W1DEO, Cape Elizabeth, Maine, W1KHL, S. Norwalk, Conn., W1KYF, Ridgefield, Conn., W2TBD, Medford, N. J., K2IEJ, Oceanaside, L. I., and W1REZ, Stratford, Conn. W2TBD is about 650 miles. VE1QY, Yarmouth, N. S., also had a busy time that night, but we have no record of his contacts.

The 2-meter DX schedules of W7VMP (May QST, page 59) have yielded no positive results up to press time, but a separate sack with W6WSQ is producing regularly. It is 350 miles and many mountains from Phoenix to Pasadena, but signals are being heard regularly, though weakly, each way.

We get some of our v.h.f. news the long way. This tidbit came from TI2BX. He says that CO2NZ will be trying for U. S. contacts on 146 Mc. after about the middle of June. Transmissions of 3 minutes' duration will be made at 1230 and 1300, 1800 and 1900, and 2030 and 2100 EST, with listening periods following each transmission.

## 2-METER STANDINGS

Call			Call		
States Areas Miles			States Areas Miles		
W1RFU	19	7 1150	W6BAZ	3	2 320
W1HDQ	19	6 1020	W6NLY	3	2 360
W1CCH	17	5 670	W6MMU	3	2 240
W1IZY	16	6 750	W6DNG	3	2 230
W1UIZ	16	6 680	W6CCG	2	2 210
W1IEO	16	5 475	W6QAC	2	2 200
W1KCS	16	5 600	W6EXH	2	2 193
W1AZK	14	5 650			
W1MNF	14	5 600	W7VMP	4	3 417
W1BCN	14	5 650	W7JU	4	2 247
W1DJK	13	5 520	W7LEE	3	2 240
W1MMN	10	5 520	W7YZU	3	2 240
			W7JUU	3	2 140
			W7RAP	2	1 165
W2ORL	23	8 1000	W8BFQ	29	8 850
W2UK	23	7 1075	W8WVJ	28	8 1200
W2NLY	23	7 1050	W8WJC	25	8 775
W2AZL	21	7 1050	W8RMH	22	8 690
W2QED	21	7 1020	W8DX	22	7 675
W2BLV	19	7 910	W8SRV	20	8 850
W2OPQ	19	6 —	W8W	20	7 —
W2DWJ	18	6 632	W8WRN	20	8 670
W2AOC	18	6 660	W8BAX	20	8 685
W2UTH	16	7 880	W8JWV	18	8 650
W2PAU	16	6 740	W8EP	18	7 800
W2PCQ	16	5 650	W8ZCV	17	7 970
W2LHI	16	5 550	W8RWW	17	7 630
W2CFT	15	5 325	W8WSE	16	7 800
W2DFV	15	5 —			
W2AMJ	15	5 550	W9EHN	24	7 725
W2QNZ	14	5 400	W9BPV	23	7 1000
W2BRV	14	5 590	W9FVJ	22	8 850
			W9EQC	22	8 820
W3RUE	23	8 950	W9CLR	21	7 690
W3NKM	19	7 660	W9UCH	21	7 750
W3IBH	19	7 650	W9ZHL	21	7 —
W3BNC	18	7 750	W9KPS	19	7 660
W3FPH	18	7 —	W9MUD	19	7 640
W3TDF	16	6 720	W9REM	19	6 —
W3KWL	16	7 720	W9LF	19	7 —
W3LNA	16	7 720	W9ALU	18	7 800
W3TDF	16	5 570	W9GAB	18	7 750
W3GKP	15	6 800	W9JGA	18	6 720
			W9WOK	17	6 600
W4HHK	26	8 1020	W9MBI	16	7 660
W4AO	23	7 950	W9BOV	15	6 —
W4PCT	20	8 —	W9LEE	15	6 780
W4JFV	18	7 830	W9DSP	15	6 760
W4MKJ	16	7 665	W9JNZ	15	6 560
W4UMF	15	6 900	W9DDG	14	6 700
W4ONC	14	7 900	W9FAN	14	6 680
W4JHC	14	5 720	W9QKN	14	6 620
W4WCB	14	5 740	W9UIA	12	7 540
W4TCR	14	5 720	W9ZAD	11	5 700
W4UBY	14	5 435	W9GTA	11	5 540
W4IKZ	13	5 720	W9JBF	10	5 760
W4JFU	13	5 720			
W4UDQ	11	5 850	W9EMS	26	8 1175
W4ZBU	10	5 800	W9IHD	24	7 870
W4MDA	9	4 650	W9GUD	22	7 1065
W4DWU	8	6 625	W9ONQ	17	6 1090
W4TLA	7	4 850	W9INT	14	6 830
			W9OAC	14	5 725
W5RCI	21	7 925	W9ZDF	13	7 800
W5JTI	19	7 1000	W9ZJB	12	7 1097
W5AJG	11	4 1260	W9WVGZ	11	5 760
W5QNL	10	5 1400			
W5CNW	10	5 1150	VE3AIB	20	8 890
W5MWV	9	4 570	VE3DIR	18	7 790
W5ML	9	3 700	VE3BQN	14	7 790
W5ABN	9	3 750	VE3DLR	13	7 800
W5ERD	8	3 570	VE3BFB	12	6 715
W5FEK	8	2 550	VE2OK	12	5 550
W5XK	7	4 —	VE3ACQ	11	7 800
W5VY	7	3 1200	VE1QY	11	4 900
W5ONS	7	2 950	VE7FJ	2	1 365
W5ESC	7	2 500			
W6WSQ	4	3 1350			
W6ZL	3	3 1400			



The advent of Technicians on 50 Mc. has helped the activity picture markedly. Not only has the new order produced additional stations, but it has encouraged the old hands to spend more time on the band. Here are a few regularly scheduled operations we've heard of recently. In the Puget Sound area W7s TMU YJE DYD TMM PQS UFE PRW KGQ VIC PZP KO and GOU are on 50.4 regularly, checking the band at 1900 PST nightly. W5ZVF is on 51.16 Mc., evenings and early mornings. W0FKY and W0CNM are active regularly in Grand Junction, Colo., also making trips into Utah in the hope of providing that very rare state for some of the gang. W0FKM is on 50.064. Hal reports that there is an active 2-meter net in Western Colorado, comprising W0CNNI, 144.1 Mc., W0PXZ, 147.2, W0QEL, 144.4, W0PCB, 144.5, and W0FKY, 144.018.

From the R.F. Carrier, Dayton Amateur Radio Association sheet, we learn that 2100 is 6-meter time in the Dayton area. W8WRN, Columbus, checks 6 (makes transmissions; no cold-filament listening) several times daily. W8CMS, Newton Falls, Ohio, says that about 20 new stations have appeared locally, with prospects good for at least 10 more soon. Claire now has a 4-125A in the final on 6. W8PCK, Silvertown, Ohio, is on each morning, Monday through Friday, between 0900 and 1115, and at all hours over week ends. He says that W8s HQK SVU QIS PLB JSW LPD PCK and SDJ are keeping the band active in the Cincinnati area. An unsigned note reports that the Joliet, Ill., Amateur Radio Society has a net on 53.28 Mc. W9OKM and W9VQO monitor this frequency regularly with fixed-tuned receivers.

That Nevada-Utah expedition we reported in May QST is being whipped into final form by W2QCY. The 6146 transmitter delivers 45 watts output, and the converter is all set, as is the audio section. Some test hops to near-by high locations will be made in June, to be sure that all is in order for the big one the latter part of the month. Provision will be made for VFO operation, both 'phone and c.w. Operation will be undertaken from Utah and Nevada locations during the latter part of June and early July.

That hard-to-work state of Nebraska will be on tap again this summer, courtesy of W9EET/Ø, at Lincoln. Gordon will be set up about July 5th, and will operate through at least the 16th. His rig will run 90 watts input on 50.1 to 50.4 Mc. He will QSL all contacts, but eager ones may write him at his Callbook address in Chicago.

The 50-Mc. DX season got under way in good style over most of the country during May, and DX reports were coming in to your conductor's desk in numbers we've not seen in some years. Sporadic-E skip of the single-hop variety is a common occurrence in May, June and July, despite the fact that it always comes as a big surprise to the newcomer to learn that contacts can be made on 50 Mc. over distances of 1200 miles or more. Individual reporting of two-way work is out of the question at this season, because of the great number of contacts made. We're always glad to have the reports, however, as they help to keep the national picture in focus, so keep 'em coming.

If you have trouble reading the modulation on weak signals, try turning on the b.f.o. and tuning it to zero beat, says W9GAB, Beloit, Wisc. On some receivers this will make an appreciable improvement in the readability of voice modulation.

The 2-meter net of the Atlanta area, inactive for some time, is being reactivated. W4LRR reports that a meeting is held each Sunday at 1300, on 144.138 Mc. The gang usually get together Saturdays around 1000.

W5FEK, Houston, reports some nice work on 144 Mc. W5UUM at Edna, W5IHS, Eagle Lake, and W5IRP, Livingston, work regularly at noon. Livingston is about 120 miles, and Edna is 160 miles. W5IRP has also worked W5EIV, Alice, Texas, about 290 miles on noontime skeds. These are not long distances for band-open conditions, but the skeds are maintained at a time of day when propagation is not likely to be too favorable.

V.h.f. DX tip from a guy who never works any, W9BRD. Rod sits for hours at the console of KSB242 listening to the signals rolling in on the 155-Mc. police band. He says that there are hundreds of stations on 155.37 Mc., and 155.01, 155.13, 155.25, 155.61 and 155.73 are other widely-used channels. Other frequencies in the same part of the spectrum are used locally. As the point-to-point stations give their locations in each transmission, the signals are reliable indicators of good v.h.f. conditions. Now you may not be set up for listening in this frequency range, but plenty of ham

50 Mc.		
W0ZJB.....48	W5VY.....48	W9ZHB.....48
W0BJV.....48	W5GNO.....46	W9QCV.....48
W0CJS.....48	W5ONS.....45	W9HGE.....47
W5AJG.....48	W5JTI.....44	W9PKP.....47
W9ZHL.....48	W5ML.....44	W9VZP.....47
W9OCA.....48	W5SEW.....44	W9RQM.....47
W6OB.....48	W5FSC.....44	W9ALU.....47
W0INI.....48	W5JLY.....43	W9QKM.....46
W1HDZ.....48	W5JME.....43	W9CTA.....45
W5MJD.....48	W5VV.....42	W9TNS.....45
	W5FAL.....41	W9MIFH.....36
W1CLS.....46	W5HLD.....40	
W1CGY.....46	W5HEZ.....38	W0QIN.....47
W1LL.....46	W5FXN.....38	W9DZM.....47
W1GJO.....45	W5LIU.....37	W0NFM.....47
W1LSN.....44		W0TKX.....47
W1HMS.....43	W6WNN.....45	W0KYF.....47
W1DJ.....41	W6ANN.....45	W0JOL.....46
	W6TMI.....45	W0HUV.....46
W2AMJ.....46	W6WS.....44	W0MVG.....46
W2MEU.....46	W60VK.....40	W0WKB.....45
W2RLV.....45	W6CGC.....35	W0TJF.....44
W2IDZ.....45	W6BWG.....30	W0JHS.....43
W2FHH.....44		W0PKD.....43
W2GYV.....40	W7HEA.....47	W0PTI.....41
W2QVH.....38	W7ERA.....47	W0PKY.....32
W2ZUW.....36	W7BQX.....47	
	W7FDJ.....46	VE3AET.....43
W3OJU.....46	W7DYD.....45	VE3ANY.....42
W3NKM.....41	W7JRG.....44	VE1QZ.....34
W3MIQ.....39	W7ACD.....43	VE3ABH.....32
W3OTC.....38	W7BOC.....42	VE1QY.....31
W3KNV.....38	W7JPA.....42	VE3DER.....27
W3RUE.....37	W7FIV.....41	NE1GE.....25
W3FPH.....35	W7CANI.....40	CO6WW.....21
W4FBH.....46	W8NSS.....46	
W4EQM.....44	W8NQD.....45	
W4QN.....44	W8UZ.....45	
W4FWI.....42	W8RFW.....45	
W4CPZ.....42	W8CMS.....43	
W4FLW.....42	W8SQU.....43	
W4XNC.....41	W8BFQ.....42	
W4MS.....40	W8YLS.....41	
W4FNR.....39	W8OJN.....40	
W4IUJ.....38	W8LPD.....37	
W4BEN.....35		

**Calls in bold face are holders of special 50-Mc WAS certificates listed in order of award numbers. Others are based on unverified reports.**

operators of police equipment are. They're good fellows to know, if you want to keep tabs on favorable propagation.

Confusion in the Picnic Department. Unknown to each other, the Terre Haute and Western Michigan v.h.f. groups scheduled picnics on the same date, July 31st. When the Michigan gang heard that they decided to move their date to August 14th, Turkey Run having become something of a National Convention of v.h.f. operators in recent years. This info from W8NOH.

Here's a 220-Mc. item we missed last month. On April 22nd W5AJG hit the jackpot. After catching a new state on 144 Mc. by working W4UUM, Pensacola, Fla., he hooked up with W5JTI, Jackson, Miss. Signals were strong on 144, so they changed to 220 and worked on the higher band with equal signal strength. This is just under 400 miles, and W5AJG's first out-of-Texas contact on 220.

### 1215 Night in Los Angeles

The Two Meter and Down Club of Los Angeles has been an eminently successful v.h.f. club for some years now, but the "and Down" part of the organization's name has not received too much attention. There has been scattered activity on 220 and 420 Mc., but little on the higher bands. To encourage members to move to higher frequencies, the club recently staged a 1215-Mc. night, under the direction of its president, Don Goshay, W6MMU.

Members were urged to bring equipment for 1215 Mc. and higher bands to the meeting for others to see. Some of the gear is shown by W6MMU in the accompanying photograph by K6GLG. Item 1 is Don's parabolic reflector. The illuminator has a standing-wave ratio of 1.09:1 at 1225 Mc. Just below it is a collinear array with plane reflector made by W6NLZ. Phasing lines are electrically one wavelength long, so no transposition is needed. Pairs are spaced ¾ wavelength apart physically. Item 3 is a mixer assembly by W6DQJ. It has a quarter-wave coaxial line tuned at the

(Continued on page 132)





# Operating News



F. E. HANDY, WIBDI, Communications Mgr.  
R. L. WHITE, WIWPO, Asst. Comm. Mgr., C.W.  
PHIL SIMMONS, WIZDP, Communications Asst.

GEORGE HART, WINJM, Natl. Emerg. Coordinator  
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., 'Phone  
LILLIAN M. SALTER, WIZJE, Administrative Aide

**More FCC Suspensions.** Several different and significant FCC actions have already been reported to you; see page 70 of March '55 *QST*. To those now add the following:

FCC Ordered (29 April, 1955) that the Novice Class operator license of A. R. Bookoff, Miami, Florida, be suspended 120 days, that the license be turned in to the FCC and KN4BQU not be permitted to be operated by any person in the 120-day period, *it appearing that the licensee*, on Jan. 14, 1955, violated Sec. 12.23(e) and 12.158 of FCC rules by using call sign KN4BQU which is not assigned to him and by transmitting on a frequency of 3855 kc. using Type A-3 emission which is not authorized for use by Novice Class licensees.

FCC Ordered (11 May, 1955) that the Technician Class amateur operator license of Charles K. Heath, Hinsdale, Illinois, be suspended for six months, that the license be turned in to the FCC and W9ZIZ not be permitted to be operated by any person in the period of the suspension, *it appearing that the licensee* while operating or supervising work at his amateur station violated Sections 12.23 and 12.28 of FCC rules by transmitting and/or authorizing others to use his equipment on frequencies below 50 Mc. He violated sections 12.82(a) and 12.158 of the rules with regularity by using and/or offering others while using his equipment to use call signs not assigned to him, especially W9WFN/9; and also violated section 12.136(b) by not keeping his station log with proper signatures.

**About Learning the Code.** Having memorized the code by its sound values many (starting in) look to some radio club or operator who is a friend for 'round-the-table instruction. This is fine, when it can be got; besides a League booklet *Learning the Radiotelegraph Code* that can help, ARRL also periodically prints a list of clubs that have arranged to give local instruction to assist budding amateurs. But it is no occasion to despair if completely without such a local group. Many of the *best* operators learned their Continental *by listening*. It is important in getting started to listen to tape-sent code or an experienced operator to get the proper sense of rhythm, or the spacing of characters and words in code work. The most vital thing of all is to *practice*; stick with it for yet more practice. Only practice makes progress and perfection possible. In using W1AW's daily hour of practice do *not* stop "writing down" at the speeds you can comfortably set down on paper! Copy just as diligently *all the letters you can get* at higher speeds. Use the bulletin transmissions in the earlier or later period deliberately to get what you can at speeds definitely beyond your ability to make solid copy! Look over the bands and spectrum between the amateur bands for stations that are repeating their identification or calls.

You may not at first be able to make much of this. With careful listening to repeated calls, however, you will start getting a letter here and

there, till finally you have a whole transmission and the station's identity. It is bound to be a big thrill to ferret out this pioneer bit of intelligence, entirely by your own efforts! Don't overlook the opportunity to hook up an inexpensive oscillator and key and *send* in rhythm with the W1AW tape, too. (Consult the monthly *QST* announcement of the Code Proficiency Program to note those special nights when we give the subject of the practice text. With that in hand you can send in step with the transmitter and perfect your rhythmic responses.) A *lot* of receiving practice is essential. Highest authorities in this field of learning, however, recommend that at least 25 per cent or more of one's time be spent in *sending* practice. This advances the general ability to coördinate in fast recognition of all the letters and aids your *reception* as well as sending ability. The whole idea in amateur radio is "learn by doing." Once you can memorize and buzz the letters locally, most anyone can learn Continental just by regular periods of tuning in and getting the essential practice on the stations that can be tuned in.

**Why? (Echo from ARRL DX Test!)** P. W. Watson, ZL3GQ, writes, "May I say how much more satisfactory the number system as used by the Ws in your DX Test was. This must be of inestimable value to anyone chasing WAS. However, I have one minor criticism of W/VE operating. If a W/VE receives a report of 579 to 599 I'd estimate 95% of the time he could send the exchange *once*. Why did those getting such reports send their number three times? . . . And when a lower S report was given even send it four times!" We confess we can't explain this, since in our poor efforts with a paltry 200 watts, we never had to use more than a single repeat as an investment against a time-consuming additional transmission. It is our guess that some operators have never reflected that the "R5" means "perfectly readable" with the S7 to 9 indicating "moderately to extremely strong signals!"

**RACES Insignia.** Until recently we had not heard where RACES authorized groups could obtain the RACES insignia as mentioned in this column in April *QST* and as illustrated herewith. A number have written for more details so we quote from the FCDA memo which constitutes the legal background and the detailed description. "The RACES insignia has superimposed on the official Civil Defense insignia a white jagged arrow edged in blue resembling a flash of lightning, symbolic of space radiation, containing the inscription 'RADIO' in blue letters, and extending

from the upper right circumference of the blue circle through the lower lefthand angle of the triangle. Below the triangle and within the blue circle is the inscription RACES in white letters."

W9UMS writes us that their c.d. office at Evansville, Indiana is financing their group to obtain 50 RACES c.d. emblems. W2BGO advises that the Forbes Products Corporation, 625 So. Goodman Street, Rochester 20, New York can supply the design at 25 cents each in lots of 500.

— F.E.H.



Versatile W9NZZ is perhaps most famous for the traffic work which won him the 1953 Edison Award. Some of the other certificates and awards which Stan has earned pounding brass since 1922 include: Edison Award Special Citation, 1952; Edison Award Hurricane Citation, 1954; plaque from British Arctic Expedition, 1952-54; Indiana's Outstanding Radio Amateur, 1954; two ARRL Public Service Awards; A-1 Operator Club; CP-35; BPL Medallion; section winner, 1947 VE/W Contest; DXCC (150); KZ-25; WBE; BERTA; DUF-4; Radio Onda; RCC; WFJS; WASM; WAC; WAS (3 bands, c.w.); WAVE; OTC; ORS; 50 BPL cards; and several crests and trophies from the Arctic.

APRIL CD QSO PARTIES

"One of the best spring parties on record," were sentiments voiced by numerous participating ARRL appointees and officials. ORS W6BIP found activity brisk enough on 80 through 15 meters for him to grind out 146,497 points and leave other c.w. competitors in his wake, while New Mexico ORS W3DWT supplied a tougher section as he went about accumulating 144,270 score-points. W4YHD's shrewd handling of the M.I.T. set-up likewise resulted in a husky tally for W1MX. Sidelight: W4KFC took part for just a short spell but reports his busiest flurry in any contest to date: 73 QSOs in one hour of 3.5-Mc. brasspounding. . . . Despite fierce QRN from storms and rain static, PA1/OPS W4TVO plied 40 and 75 for a dandy 20,825-pointer to edge the 'phone brethren. W9KDV, with W9VFY doing the talking and switch-throwing, and RM W1CRW reached the other top positions with scores of 15,840 and 14,645 points, respectively. Full results in July CD Bulletin.

C.W.

W6BIP	146,197-272-59	W1ZIO	72,240-297-48
W5DWT	144,270-451-63	W1FZ	71,500-255-55
W1MX	143,655-464-61	W4WAZ	71,280-262-54
W1LOB	138,775-448-61	W6JWD	71,001-161-49
W4KVN	134,200-440-61	W2IVS	70,125-248-55
W1TYQ	133,500-445-60	W4WQT	69,750-274-50
W4PKN	122,700-409-60	W4YZC	68,105-250-53
W3JTK	119,180-404-59	W1NXX	66,000-257-50
W4IA	113,850-407-55	W9DW	63,990-237-54
W2ZVW	102,175-328-61	VE6ZR	60,122-143-46
W3VOS	96,660-353-54	W0PHR	59,000-236-50
W6CMS	91,902-198-51	K2DSW	58,880-252-46
W5GBF	87,500-295-58	W9NH	56,610-216-51
W3DVO	87,210-316-54	W7JLC	56,072-141-43
W1JTD	85,840-289-58	W5YDR	55,900-215-52
W8LHV	85,595-316-53	K6BWD	54,684-128-47
W9SDK	85,250-303-55	W4AMZ	54,600-260-42
W3TMZ	84,150-330-51	K2AFQ	54,510-233-46
W2FEB	79,750-290-55	W4WQW	54,250-211-50
W9KLD	79,110-290-54	W2DMJ	52,525-184-55
W0ILB	78,650-286-55	W3QZC	52,320-212-48
W6CRT	75,762-152-54	W9RKP	51,695-205-49
W5NOH	74,100-280-52	W2AEF	51,480-198-52
W0RDN	73,700-268-55	W1EPE	51,385-239-43
W1AW	73,530-251-57	W2GXC	50,880-212-48
W1CRW	73,320-282-52		

'PHONE

W4TVO	20,825-119-35	W1AW	8510-67-23
W9KDV	15,840-96-33	W1YBH	8030-70-22
W1CRW	14,645-101-29	W4IA	7590-62-22
W5NOH	13,720-93-28	W8NSS	7475-60-23
W1FZ	11,880-94-24	W2ZVW	7000-63-20
W1MX	11,000-81-25	W1GVK	6900-60-23
W7RSP	10,350-64-25	K2DSW	6900-65-20
W0AGD	9600-61-30	W1AQE	6500-65-20
W0RPN	9570-63-29	W9SDK	6480-47-24
W1JYH	9130-76-22	K6BWD	6080-40-16
W1ZIO	8580-74-22		

1 W4YHD, opr. 2 W1QIS, opr. 3 W9VFY, opr. 4 W1WPR, opr.



William F. Ham, W1RRX, ARRL Section Emergency Coordinator (fourth from left), congratulates James Saunders, W1BDV, Faculty Advisor of the Northbridge High School Radio Club, Whitinsville, Mass., as club members look on. W1RRX lauded the group for developing teen-age radio operation and expressed the wish that more schools would follow their outstanding example. The occasion was the appearance of the students on Teen Time, a weekly program honoring youngsters and telecast over W WOR-TV, Worcester.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C.W.	'PHONE
3550 14,050	3875 14,225
7100 21,050	7250 21,040
28,100	29,640

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: C.W. — 3535, 7050, 14,060; 'phone — 3765, 14,160, 28,250 kc.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc.	7140 kc.
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There seems to continue to be some question about the relation between the AREC and RACES. Why, we wonder? On a good many occasions, we have attempted to clear this up, but in some places there is still conflict. Who causes the conflict is a detail, but it takes two to make a fight. Obstreperous AREC groups on the one hand, and a cold, fishy attitude on the part of c.d. people on the other hand can cause all kinds of trouble. They are matters for local resolution.

ARRL's official view of the relationship is that the two organizations are (i.e., *should be*) overlapping and inter-lacing — in some places identical. We are not ready to drop the AREC overboard, for several reasons. The most important one is that we've worked hard, we amateurs, for the last 20 years, to make the AREC our own emergency service organization, and we're proud of it. As long as there is a need and use for it, we want to maintain it — and where no particular c.d. program exists, there is plenty of need for it.

But this does not mean that the AREC wants nothing to do with RACES. On the contrary, long before there was an FCDA heading up the nation's civil defense preparedness effort, ARRL officials were urging that radio amateurs be given a key rôle in civil defense communications. As much, if not more, than any other group or individual, ARRL was



Amateurs of the Sioux Amateur Radio Assn. have converted this bus into a mobile communications center. Civil Defense and Red Cross have cooperated in installing transmitting and receiving equipment, a 6500-watt generator, field telephones and a p.a. system.

an active midwife at the birth of RACES. We think, and have thought right along, that the AREC is the natural and logical instrument at local level for the implementation of RACES. In the places where RACES has been most successful, it has been just this. It's one of the things that the AREC was set up for: to serve any need for emergency communications that might arise.

Such a philosophy will not embrace the premise that precipitant abandonment of all previous organization for a new concept is a desirable course of action to follow. You might as well ask the telephone and telegraph companies to abandon their previous organization and set up anew, under new leadership, new policies, using new equipment. It won't work. *Full use of existing facilities* is requisite, both to our efficiency and our economy. The AREC is an existing facility. It is flexible enough to embrace the new civil defense function, and where sufficiently supported can (and has) become RACES. The EC and radio officer, if they are different people, *must* work together toward the common civil defense end, whether they care for each other personally or not. AREC members *must* sign up in civil defense. We have a job to do in implementing RACES. Civil defense has a job to do in utilization of the amateur

service for communications purposes. Let's stop asking ourselves and each other foolish questions, and *get the job done!*

The AREC and RACES, at top level, are wedded for the duration. This state of wedlock must be made to extend to all levels. That's the job of you fellows on the ground floor, so get a firm grip on your prejudices, personal and otherwise, and let's get the ceremony under way.

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A snowplow and its crew got stranded in a blizzard in the wilds of Western Nebraska on February 19th, and W0AIN was called on to help find them. He contacted W0LOD in Ogallala on 3525 kc., since telephone lines were down between Ogallala and Lewellen, and relayed the information that they had left Lewellen at 1700 on the 19th. Late the next afternoon it developed that the men were safe. W0AIN sent this word to W0LOD, who notified their families. Other stations participating: W0s ZAA GEQ UOB BEN.

— . . . . —  
When a telephone cable broke down between the La Crosse (Wis.) Municipal Airport and Madison on February 25th, amateurs filled the communications gap until it was repaired, obtaining weather and flight information from Madison on behalf of airport officials, CAA and the Weather Bureau. W9GPO and W9OGT held down the La Crosse end, while W9OOL kept contact from Madison. Excellent publicity was received on television, radio and the newspaper on this bit of public service. — W9AKY, EC La Crosse, Wis.

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From the Ontario SCM we have gleaned the following: "We would like to commend VE3UJ who tried for two hours to get Sarnia and Chatham Civilian Defense hooked up during the windstorm of March 22nd. The Oil City Civil Defense readied two trucks to dispatch to Chatham, but the efforts of VE3UJ made the long and dangerous trip in grim weather unnecessary. Appreciation from c.d. officials is extended also to VE3s AWQ LB DIJ DZ and MW. Traffic for the London *Free Press*, civil defense and police officials was handled due to wire facilities being out. VE3EI and VE3BVM also exchanged important traffic.

— . . . . —  
A severe train accident near Albany, N. Y., was the occasion for some creditable work turned in by amateurs of the Capital Area Radio Emergency Net on April 2nd. W2EOM and K2ACB flashed word of the emergency and within a few minutes six mobiles were proceeding to the scene. K2CWX assumed net control. Of the six mobiles, W2EOM, W2SZ, K2AYH and KN2IUE arrived at the scene. KN2JHY was turned back by police, and W2FEN set up in Castleton to act as a relay station. K2AYH, W2SE and KN2IUE placed their cars at strategic locations while W2EOM took his portable down to the wreck. Stations on the "home front" were W2s AWF DIF TMM and K2s BUV (operated by W2GTZ) ACB and GAZ. The net was conducted in an efficient and businesslike manner throughout. Much informal traffic was handled and one formal message was relayed out of the area via K2BUV. Much credit for the operation goes to the NCS, K2CWX, at the Veterans Hospital.

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The Smoky Mountain Amateur Radio Club in April organized a network to furnish radio assistance to the Maryville (Tenn.) Police Department when this community was left without adequate emergency telephone service. W4BXG (EC for Blount County) reports the following stations active: W4s AMA BXQ FEP JSP OKD NLJ TZB VSS VTT ZEN ZSI QZC FHT, KN4s AAO AAV COF CRV, and W5ILR/4. These stations manned net facilities consisting of fixed and mobile units on two and 160 meters. For 23 days, police traffic, medical and other matters were handled as emergency radio communications.

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VE5LU, SEC Saskatchewan, reports that landlines were out in the blizzard that hit southwestern Saskatchewan April 3rd. Amateurs assisted in restoring communications for the power companies, VE5TV and VE5LU maintaining schedules three times daily through April 6th. Others participating: VE4AI, VE5s BO TV CM BH RU CX MS LU and RE.

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The Texoma Amateur Radio Club was called into action for emergency operation when a tornado struck Sherman, Texas, on April 6th at 0245, disabling telephone and power

circuits. The first mobile was on the air at 0415, a net control station with auxiliary power having previously been set up. The civil defense radio unit operated three field stations and four mobile stations several hours following the storm with one out of town trip to Perrin AFB for additional fire-fighting apparatus for Gunter. The work of the amateurs participating was highly commended by the civil defense director and assisting auxiliary police chief. Those participating were W6s UTB IDZ POG LDG SGR DGG and UIQ. — W5UTB, EC Sherman, Tex.

The snowstorm that hit western Nebraska on April 12th took the town of Potter out like a light — literally. Potter had no electric power for two nights, and communication lines were down, too. W0KQX started his putt-putt in his snow-covered back yard and made contact with W0UOB, in Sidney, to provide the only communications. He was able to tell Sidney that no special emergency measures were required, although many Potter residents were suffering from cold. The communications situation was returned to normal on April 13th.

On April 17th, a distress call from W6GRU/m was heard on the American Legion Amateur Radio Net frequency (3975 kc.). He gave his location as the Donner Pass road east of Sacramento, where the snow had reached 18 inches, resulting in blocked highways. Traffic was heavy due to the North American Ski Championships being held in the area. W6GRO took over the net, with W6EPB assisting, and contacted the California Highway Patrol to start relief equipment on the way. The experience gained in the Tehachapi earthquake proved invaluable. An amateur employed by the California Highway Patrol (call unknown) set up a station in the office and maintained contact with W6GRU/m until relief arrived about 2240. K6EJT and K6ECP maintained control with W6GRU/m until he reached Sacramento. Also active were W6s QMO CNA OFJ and IDY. This incident rated bare headlines in the Los Angeles Times for April 18th.

— W6WJP, PAM San Joaquin Valley

The Alabama Emergency Net P was alerted at 2200 on April 23rd during a tornado warning for Northern Alabama. The alert lasted until 0230 April 24th. W4s HKK TKL AZX and ZSQ took turns as NCS. Traffic was handled for the Tennessee Valley Authority to participate in the search for a lost boat on the Tennessee River. Other stations participating: W4s ZWE ATF FEC CDE SX OAO IKE NIQ WXW YDU ZSH ZSB UHA HYI BOE MEP HTP GCV WEM OGV SMD WGT GVI HFU, W5s RNB GGG SHX.

— W4TKL, SEC Alabama

On May 3rd, a heavy snowstorm hit Saskatoon, Sask. The wet snow clung to everything it hit, and soon telephone and electric wires and poles were bending and snapping under the weight. At 1730, VE5LMI called VE5BG to relay a message to the phone company that his telephone was out. W5RE also was without telephone communications. VE5DR was asked by the civil defense director to arrange communications for the power company. This he did, and VE5DR and VE5EH went to the local club station set-up at c.d. headquarters. There they found the antenna down. After repairing this, the power went off; so they took a portable power plant to the VE5DR location and were soon on the air.

This was the beginning of a busy time for the amateurs. VE5s DN, DG and RE were kept busy handling messages for the power company, which was in dire straits, and later the railroads called on the amateurs to help them with some of their communications. Schedules were maintained from VE5DR (with VE5EH assisting) all through Tuesday night. VE5JG at Regina also came on the air, staying until 0200. VE5s DN and RE remained operative throughout the night. On Wednesday morning (May 4th), VE5CM was on from Regina and remained all day. VE5WW also was on from VE5DG, and VE5JP did some very valuable relay work. VE5BU operated on emergency power for a while, but ran out of gas. VE5BG took over from VE5DR at 0830 Wednesday, later assisted by VE5s BD RL and DU. VE5VL was on stand-by. VE5s FY and YF sent and received news dispatches to the outside by tape recorder, since normal news-dispatching agencies were without communications. Helping out in this news coverage were VE5s JP YJ RB VD DD and WW. Considerable traffic

was handled during the day by VE5DR, who later made a radio broadcast via amateur radio, VE5DR to VE6OD. VE5HR was in the hospital and unable to be active, but supplied us with all the above data.

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Sixteen SEC reports were received for March activities, representing 5356 AREC members: Minn., S. Dak., Ky., Tenn., Maritime, Ga., Wash., W. N.Y., E. Fla., N.Y.C.-L.I., Ore., Wisc., San Joaquin Valley, E. Bay, Los A., Ont. The Los Angeles SEC reports 1424 AREC members in his section, and claims this to be the highest in the United States, by plenty. The number increases a little each month. So far, no one even comes close to this number, N.Y.C.-L.I. being second with 742.

## RACES News

From FCDA, we have the latest info (May 17th) on states having fully-approved RACES plans. We thought this would be of interest to you. The following are fully approved for RACES: Alabama, California, Colorado, Connecticut, Delaware, Georgia, Illinois, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Missouri, Nebraska, Nevada, New Jersey, New Mexico, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Tennessee, Vermont, Virginia, Washington, West Virginia, Wisconsin, Alaska, Hawaii, D.C. Now being processed are the state RACES plans for Florida, Minnesota, North Carolina and Wyoming. Not yet heard from are Arizona, Arkansas, Idaho, Indiana, Iowa, Kentucky, Maine, Mississippi, Montana, New Hampshire, North Dakota, South Carolina, South Dakota, Texas and Utah. Thus, 29 states, two territories and D.C. now have approved RACES plans, and by the time you read this the chances are good that four more will have been approved. RACES organizers in the states mentioned above as "not yet heard from" should get the ball rolling toward their state RACES plan, if possible. The time to do this is now, not after the bomb falls.



One place where they have successfully combined the AREC and RACES is Steubenville, Ohio, where, under EC/RO WSERR, this group had the second FCC-approved RACES plan in the state. The main control is located in town, but there is also an alternate control station seven miles out of town. A 22-foot house trailer is being equipped as a mobile alternate control station. The call used for RACES is WSERR.

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In St. Lambert, Que., amateurs are alerted for civil defense by the police station, which receives the warning from the Air Defense Command, RCAF. Only EC VE2KG is called. He then calls two other amateurs, each of whom call two additional amateurs until all personnel are alerted. This process makes it possible to notify all personnel within six minutes after receipt of the alert.

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We don't believe we have previously recorded the presence on the FCDA staff of another amateur. He is Jim MacGregor, W8DUA, formerly in charge of Kalamazoo Police Radio and a staff member of WOOD-TV in Grand Rapids. Mac visited us in connection with the April 30th Region I Test, and will work with Charlie Dewey, WSLBM (see April QST, p. 73), on RACES. It is good to know that we will have two active amateurs on the FCDA Staff so intimately concerned with the processing of RACES applications and RACES implementation on a national scale. We hope that their presence will have a salutary effect on the progress of RACES at all levels.

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From Key-Kliz, publication of the Santa Barbara Amateur Radio Club, we glean the information that the Santa Barbara RACES plan has been approved by FCDA as of March 21st, the first approved plan in California C.D. Region Seven. This was the result of "three years' intensive spadework by c.d. officials in this area," says the bulletin. Frequencies to be used are 29,550, 29,470, 145,460, 145,500 and 147,240, crystals for which will be furnished authorized amateurs. K6BVA is the call that will be used by all stations. Says the editor: "Key-Kliz will keep you posted as the red tape is unraveled."

## MEET THE SCMS

Edward F. Conyngham's interest in radio dates back to his early childhood when he heard all the wonderful accounts of how the operator on the SS *Titanic* sent out messages reporting the disaster. A few years later an ex-Navy operator gave him first-hand information on the workings of radio and in 1934 he was issued his first license.

W7ESJ is housed in a special room and transmitting equipment is comprised of a Navy TBW-3, 803 final; a Navy GP-7 modified, 803 final; a Navy TCS-12, pair of 1625s final; a Viking II; an Elmac AF-67; a Lyco 600; and a homemade rig with a pair of 46s in the final. Re-



ceivers are an S-76, a BC-342, an Elmac PMR-6A, and three Command receivers for monitoring. Antennas regularly used are an 80-meter half-wave, center fed with open-wire line; a 100-ft. Marconi; and a 50-ft. Marconi. For emergencies a PE-108 a.c. generator is used to power the Elmac and TCS transmitters.

Since his election as Oregon's SCM, Connie has relinquished his appointments as Official Observer and Section Emergency Coordinator, but has retained the post of Official Relay Station. He has been issued Public Service certificates for his assistance in Columbia River and other emergencies and also has Rag Chewers Club, Old Timers Club, and Code Proficiency certificates, the latter for 35 w.p.m. While on a destroyer in 1939 he was clocked for 1½ hours receiving press at 52 w.p.m. He holds membership in the Portland Amateur Radio Club and the Amateur Radio Association of Bremerton and is an enthusiastic participant in the monthly on-the-air parties for League Officials.

A retired Navy man, Connie enjoys skiing, sailing, rowing, and watching baseball. His other hobbies are cartooning and drawing (the picture shown here is self-drawn).

## TRAFFIC TOPICS

We traffic men have a tough row to hoe during the summer months. The QRN gets worse, the days get longer, other activities get in the way of nets and schedules, and on a national basis "daylight saving" time makes a mess of our NTS time schedule. Nets lose personnel while operators go on vacations. It's a tough time of the year for organized traffic handling, and many have asked us why we try to keep going in that, why we don't close up shop in May until October.

That's a fair question, and it deserves a fair answer. After all, isn't it true that most, if not all, of us traffic men handle traffic because we like it? Never mind *why* we like it — we just do. Do we, then, enjoy it during the summer months, with lightning playing around our antennas, with weak signals and the crash of static in our ears? Are we *really* nuts?

Let's ignore that last question as an interesting but somewhat irrelevant matter of conjecture, and get at the one before it. We think that the traffic man who persists in his efforts to handle traffic when the going is rough does so because he finds challenge in it, and meeting this challenge is a form of enjoyment. Handling traffic under unfavorable operating conditions, whether they be atmospheric, propagational or environmental, is something we would certainly have to do in a national emergency. Those who meet the challenge of doing so, for whatever reason, are the ones who will be the mainstays in any national emergency, while those who throw up their hands and quit during the tough season will find themselves severely handicapped by lack of experience when the chips are down. So we offer this salute to those of the traffic gang who are still in there pitching, making our amateur traffic service a year-around service

instead of a "fair weather" plaything. Our hats are off to you, fellows!

Miscellaneous reports: (1) W8AMH reports a traffic total of 837 for the Early Bird Transcontinental Net for April, eleven stations participating. (2) The New York State Phone Emergency and Traffic Net handled 255 messages in April, with 1114 stations participating, according to W2GSS. (3) W1LYL reports 678 messages for the First Call Area Section of the Transcontinental Phone Net, with 15 stations participating. (4) The College Net had eight meetings, handled 18 messages; 62 stations called in.

**National Traffic System.** Recently someone asked us about the general quality of our NTS leadership personnel. We replied that they were all good, and some were better than others. That's exactly the way we feel about it, too. There isn't a poor manager in the whole of NTS, and never was. Managing an NTS section, regional or area net is no kid's game; neither does the job get harder or more important as you go up in level — if anything, managing a bunch of finished traffic men (such as those at regional or area level) is easier than doing the same at section level, where training has a more important role.

You fellows who participate in NTS owe it to your net manager to do your best to help him out. Volunteer for assignments needed, criticize freely but constructively, and be on deck as often as you can when the net meets. It's your net as well as his. Your participation is not particularly benefiting him, or ARRL, or even yourself; it's benefiting all of amateur radio as well. Keep this in mind, and remember also that the net manager needs your help, advice and interest. Don't leave everything to him, then blame him when the net stagnates. It's up to you, too.

### April Reports:

Net	Sessions	Traffic	Rate	Average	Representation
1RN	26	4400	0.60	15.4	92.9%
2RN	52	542	0.26	10.2	93.6%
3RN	48	309	0.43	6.4	86.8%
RN5	45	1370	1.02	30.4	69.4%
RN7	52	325		6.4	38.7%
9RN	16	210	0.88	13.1	75.0%
PAN	27	1149	1.57	42.5	100.0%
Sections*	375	2476			
TCC (Eastern)		153			
(Pacific)		457			

Summary	641	7391	RN5	11.5	PAN
Record	673	8990		17.8	

\* Section nets: AENB & AENP (Ala.); TLCN (Iowa); NTX (No. Texas); CN & MCN (Conn.); WYN (W. Va.); KYN (Ky.); MSN & MSN Fone (Minn.); GSN (Ga.); WSN (Wash.); QKS, QKS-SS & QKN (Kans.)

### Late reports:

RN7 (Mar.)	44	222	5.0	48%
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W4BVE has accepted the 4RN managership, so we can begin to look for increased activity from that quarter. RN5, under the managership of W4OGG, exceeded their previous record of April traffic (442) by so much that it



Dave Goggio, W4OGG, energetic manager of the Fifth Regional Net (RN5) of NTS, relaxes at his operating position. Dave has rejuvenated RN5 from low ebb into one of the hottest regional nets in NTS.

"ain't funny." Dave is doing a super job of getting the RN5 sections organized, and getting a lot of support from everywhere but Southern Texas. W6ZRJ is the new manager of RN6, replacing W6JOH; let's give Doc plenty of support. VE7ASR is making a big effort to get 100% representation of sections in RN7, but it's not easy. W9UNJ is resigning as 9RN Manager as soon as a replacement can be found. TRN has adopted a thrice-weekly schedule for the summer, but will endeavor to continue 100% liaison with EAN. PAN is going great guns, but Manager W7APF is having TVI troubles.

*Transcontinental Corps.* No report from Central Area this month. W8UPB reports for Eastern Area that most schedules are holding together, but there are some significant vacancies. Pacific Area is doing excellently, but now that W6HC is an ARRL Director he feels that he cannot continue as TCC Director, so there will be a new TCC Pacific Area Director soon.

## AMATEURS SCORE IN TELETHONS

We have eight reports of amateurs participating in telethons connected with the March of Dimes early in 1955. Let's summarize each one briefly, in chronological order except that dateless reports come last.

1) The Panhandle Amateur Radio Club of Amarillo assisted in the March of Dimes Telethon in that area, which started in mid-January. Eighteen amateurs in the area participated, handling 1792 messages and collecting contributions or pledges for more than \$7600.

2) Seventeen members of the Cascade Net of Portland, Ore., were among the participants in the special March of Dimes drive January 21st-22nd. A transmitter at the KOIN-TV studios was set up and operated during a special 4½-hour program. As viewers telephoned their pledges, W7AEF at the studio set-up called the nearest of 19 mobiles spotted throughout the city, which then proceeded to make the collections. During the period, the mobiles picked up a total of \$2215.82.

3) In Broward County, Fla., fixed stations in amateurs' residences were used to radio dispatch mobiles as the calls poured in over broadcast and TV stations. Thirty home stations and 15 mobiles were active in this operation on January 29th-30th.

4) In Nashville, Tenn., Operation Poliothon was a combination AREC workout and a public service venture of Nashville and Davidson County amateurs. Free time was furnished by WLAC-TV for the full period of the Telethon from 2200 January 29th to 1300 January 30th. As telephone pledges were received, a mobile would go out with a member of the Junior Chamber of Commerce, sponsors of the Telethon. Nineteen ten-meter mobiles were used during the operation, with six fixed stations scattered around the city as relay stations whenever the need arose.

5) The Owensboro (Ky.) Amateur Radio Club supplied transportation and communication for the "Mothers' March Against Polio" in that area, covering Henderson and Evansville in addition to Owensboro. A base station was set up at Mothers' March headquarters, and mobiles dispatched to make collection whenever a telephone pledge was received. Amateurs also conducted communications from the various schools at which the Mothers' March had its headquarters.

6) On February 18th, the Calgary Radio Emergency Net assisted the Canadian Legion in a polio drive. The local radio station CKXL broadcast a 4-hour program calling for telephoned bids. These bids were relayed on 75 meters to hamshacks around the town where the Legion had stationed cars, which were then sent around the district to pick up the donations. About \$4000 was collected for the fund. Fifteen amateurs participated from seven stations in Calgary.

7) We don't know the date of the telethon in Longview, Texas, but word from W5AFR via SCM W5JQD is that the Longview Amateur Radio Club and other amateurs in the district assisted in communications between various county headquarters and KTVE. Operation was on 160 and 80 meters, with six amateurs at the TV station, for 21 hours. Donations, says W5AFR, were around \$22,000.

8) In Bangor, Maine, mobiles of the Bangor Civil Defense Corps assisted in supplying communications for the Mothers' March in Bangor and Brewer. The mobiles were stationed at strategic points, with a control station dispatching them to points in the two cities as needed. Twelve amateur mobile units assisted in this operation.

## A.R.R.L. ACTIVITIES CALENDAR

July 2nd: CP Qualifying Run — W6WP  
 July 11th: CP Qualifying Run — W1AW  
 July 16th-17th: CD QSO Party (c.w.)  
 July 23rd-24th: CD QSO Party (phone)  
 Aug. 5th: CP Qualifying Run — W6WP  
 Aug. 16th: CP Qualifying Run — W1AW  
 Sept. 3rd: CP Qualifying Run — W6WP  
 Sept. 14th: CP Qualifying Run — W1AW  
 Sept. 15th: Frequency Measuring Test  
 Sept. 17th-18th: V.H.F. QSO Party  
 Oct. 7th: CP Qualifying Run — W6WP  
 Oct. 8th-9th: Simulated Emergency Test  
 Oct. 13th: CP Qualifying Run — W1AW  
 Oct. 15th-16th: CD QSO Party (c.w.)  
 Oct. 22nd-23rd: CD QSO Party (phone)  
 Nov. 5th: CP Qualifying Run — W6WP  
 Nov. 12th-13th, 19th-20th: Sweepstakes  
 Nov. 18th: CP Qualifying Run — W1AW

## BRASS POUNDERS LEAGUE

Winners of BPL Certificates for April traffic:

Call	Orig.	Recd.	Rel.	1st.	Total
W0SCA.....	8	906	872	15	1801
W0HDR.....	22	847	814	21	1704
W7BA.....	20	749	721	26	1516
W7PGY.....	78	584	553	31	1246
W7FEB.....	12	595	533	62	1202
W4COU.....	42	527	539	23	1131
W4PL.....	4	549	515	27	1095
K4AKP.....	7	543	523	18	1091
W0CPL.....	14	530	468	62	1074
W0NZZ.....	239	341	0	340	920
W9TT.....	4	532	377	6	919
W9YWL.....	44	453	339	20	856
W9DO.....	8	415	390	33	846
W5DTA/5.....	18	385	354	50	807
W5MN.....	11	386	348	41	786
W4BLR.....	16	339	286	54	695
W0BLI.....	8	338	323	8	677
W4OCG.....	8	336	290	37	671
W9IDA.....	130	274	260	5	669
W3WG.....	18	330	313	0	661
W3CUL.....	67	298	237	54	656
W3WV.....	17	341	188	73	619
W2RUF.....	20	328	204	57	609
W5KPB.....	1	295	291	10	597
W6SWP.....	66	267	209	55	597
W0PZO.....	0	305	288	4	597
W2LPL.....	22	286	268	18	594
W7APF.....	2	292	292	0	586
W5FEC.....	525	29	18	11	583
W7FRU.....	8	278	249	26	561
W9CSW.....	8	271	52	218	549
W4THA.....	167	221	154	1	543
K4FEU.....	27	258	243	13	539
W1ARR.....	55	232	183	44	514
W4PUJ.....	7	233	240	13	513
W9UJ.....	6	254	235	17	512
W9CXV.....	18	244	238	4	504
Late Report:					
K4AKP (Mar.)	32	377	357	20	786

### Mare-Than-One-Operator Stations

W61AB.....	29	1565	1314	251	3159
KH6AJF.....	933	693	573	100	2299
K5FFF.....	91	487	491	32	1101
K4FDY.....	88	503	421	26	1038
K4ZMA.....	328	288	277	11	904
K5WSP.....	147	372	362	10	891
W5PML.....	735	31	14	11	791
K6WAV.....	133	249	397	10	789
K7FAE.....	31	251	251	35	598

BPL for 100 or more originations-plus deliveries:

W9VSX	451	W4DDY	121	W0GBJ	103
W4TYU	151	K6PDG	115	W3WBJ	101
W4HDR	149	W1YCG	113	W5NDV	101
W0FRL	138	W5DAE	112	Late Reports:	
W9NLY	134	W1AJX	106	W9VSN (Mar.)	194
W6USA	128	W9FFC	106	W4HDR (Mar.)	171
W9SAA	125	W1WEF	104		

### Mare-Than-One-Operator Stations

W6YDK 187 VE5DR 126

BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: W1EEO, K2CQP, W3RV, W4PL, W5YHM, W7VAZ, W9AA.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies, within 48 hours of receipt, in standard ARRL form.

## DX CENTURY CLUB AWARDS

### HONOR ROLL

W1FH...258	W0YXO...250	W6MEK...246
W6VFR...254	W6SN...249	W6SYG...246
W6AM...253	W8NBK...249	PY2CK...246
W6ENV...251	G2PL...247	W3JTC...245
W8HGW...251	W3GHD...246	W2ACW...244
W3BES...250	W3KTP...246	W6MX...244

### Radiotelephon

PY2CK...239	WINWO...216	W9RBJ...210
W1FH...230	W1MCW...215	W3JNN...209
W4ERR...230	XE1AC...215	W9NDA...209
Z86BW...225	W8HGW...214	W5BGP...207
W1JCN...217		SM5KP...207

From April 15, to May 15, 1955 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

### NEW MEMBERS

HB9FU...167	W3OVU...104	W4JAT...101
W2DOD...139	DN2AB...103	W6QPM...101
PY7AN...113	OZ5PA...103	W8NOH...101
YV5FL...110	W4UXI...102	K2EDL...100
DL3IE...106	YV5FK...102	K4AIM...100
DL9HG...106	W1ZDP...101	W4RTX...100
W2CR...105	W4BO...101	SM5AHK...100

### Radiotelephone

YV5EC...138	W4ANE...117	W6SYG...101
HB9FU...131	W4DOV...102	HCSP...101
W3DPS...118	W2JIL...101	PY1RC...100

### ENDORSEMENTS

W3EVW...240	W6CAE...144	KP4JE...130
W3GAU...240	W8CKX...142	W2NOY...122
W5EFC...190	K2GFK...141	VE3BR...121
G8HLS...190	W9GDI...141	W7HQC...120
W3ALB...180	G3AAE...141	W9RKP...120
W5NMA...180	F3FA...141	W8RVU...118
HLXK...171	W1RAN...140	DL1EE...117
W1LZE...170	ZL2HP...133	EA3GF...116
W1BTT...162	W8MWL...131	W1AW...110
S83AKM...162	W9KKK...131	W6XNS...110
HB9MQ...161	W3ZQ...130	W8DLZ...110
W6LMZ...152		W9EU...110

### Radiotelephone

W5NMA...165	W4FBH...141	W9MWL...120
CO2BL...161	W9HP...141	W8SLV...122
W2EOH...151	W6CHV...140	W3AEV...121
CO2BK...150	W8QJR...130	W4FPS...110

### W/VE/VO Call Area and Continental Leaders

W4BPD...241	VE2VW...181	YESAA...160
W5MIS...243	VE3QD...210	VO6EP...190
W7AMX...240	VE4RO...228	4N4RE...210
W9NDA...243	VE5QZ...140	Z86BW...222
VE1HG...150	VE6GQ...108	ZL1HY...238
	VE7HC...209	

### Radiotelephone

W2APU...202	W7HIA...181	VE3KF...163
W4HA...180	W9AFW...179	VE4RO...127
W7HIA...181	VE1CR...120	VE7ZM...140
W6AM...205	VE2VW...102	OD5AB...170
W6DI...205		ZL1HY...196

## BRIEF

The Connecticut 'Phone Net is finding certain information made available by the telephone company's central and regional offices most valuable. For delivery of radio traffic the NCS and many net members are using the publication *Connecticut Localities Telephone Exchanges*, available to subscribers on request. This lists all Connecticut towns and under what main city exchanges they come. Another helpful publication is *Central Office Names*, also free on request from the New Haven office of the Southern New England Telephone Company. WILIG suggests that traffickers in other parts of the nation secure parallel publications to aid in delivery of radiograms.

## DXCC NOTES

Our DXCC Note this month will clarify the case of Corn Islands with regard to our DXCC. QSLs for Corn Islands count for Nicaragua only. Information currently originating with the United States Department of State indicates Corn Islands are solely under the administration of Nicaragua. Our FCC is fully cognizant of the position taken by the

Department of State. Therefore, any QSL submitted for DXCC credit from Corn Islands must be viewed with attention to Rule #7 of the DXCC rules which provides that only the calls issued by the administering government or licensing authority will be recognized.

The question of the distance of the Corn Islands from Nicaragua was raised in some correspondence. In view of these being only 35 miles removed from the parent country there would be no adequate precedent to justify country status on the basis of distance. (See page 68, May QST, Country Considerations, point 2.)

## CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on July 11th at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,010, 52,000 and 145,600 kc. The next qualifying run from W6OWP only will be transmitted on July 2nd at 2100 PDST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions will be made from W1AW each evening at 2130 EDST. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes the order of words in each line of QST text sometimes is reversed.

Date Subject of Practice Text from May QST

- July 5th: The "Z-Match" Antenna Coupler, p. 11
- July 8th: Automatic Mobile Antenna Tuning, p. 14
- July 12th: Vertical Multiband Antennas, p. 19
- July 14th: Six Meters for the Beginner, p. 22
- July 18th: Easy Shielding for Ninety Watts, p. 25
- July 21st: The All-Electronic "Ultimate" Keyer, p. 36
- July 26th: 21st ARRL Sweepstakes Results, p. 44
- July 29th: The World Above 50 Mc., p. 57

## W1AW SUMMER SCHEDULE

(All times given are Eastern Daylight Saving Time)  
Operating-Visiting Hours:

- Monday through Friday: 1300-0100 (following day).
- Saturday: 1900-0230 (Sunday).
- Sunday: 1500-2230.

Note: W1AW will be closed from 2230 July 3rd to 1300 July 5th in observance of Independence Day. From July 25th through August 25th, W1AW operating-visiting hours weekdays will be from 1900 to 0100, to provide for attendants' vacations.

A mimeographed local map showing how to get from main highways (or from HQ. office) to W1AW will be sent to amateurs advising their intention to visit the station.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules. Frequencies:

- C.w.: 1885, 3555, 7125, 14,100, 21,010, 52,000, 145,600 kc.
- 'Phone: 1885, 3945, 7255, 14,280, 21,350 kc.; 52,145.6 Mc.

Times:

Sunday through Friday, 2000 by c.w., 2100 by 'phone.

Monday through Saturday, 2330 by 'phone, 2400 by c.w.

General Operation: Use the chart on page 70, May QST, for determining times and frequencies for W1AW general contact with any amateur. Note that since the schedule is organized in EDST, the operation between 0000 and 0100 each day will fall in the evening of the previous day in western time zones.

Code-Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and at 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday are made on the above-listed frequencies. Code practice starts at 2130 each day. Approximately 10 minutes' practice is given at each speed. On July 11th and August 16th instead of the regular code practice, W1AW will transmit certificate qualifying runs.



• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

## ATLANTIC DIVISION

**EASTERN PENNSYLVANIA** — SCM, W. H. Wiand, W3BIP — SEC: IGW, RM: AXA, PAM: PYF, E. Pa. Nets: 3610, 3850 kc. Notice to all amateur radio clubs of E. Pa.: Your SCM will be happy to include all information such as news items and announcements of interest to all in this column each month. However, in order to be certain that this information can be used, kindly use the following as a guide. (1) Mail your news items to the SCM (address page 6) no later than the first of each month. (2) Two months will have elapsed between the time it is received by your SCM and its appearance in this column. A club bulletin is fine but in most cases it is not received in time and does not contain items that will be of interest to the gang two months later. Make it your duty as a member of a club to bring this to the attention of your president so that he may appoint someone to furnish the SCM with the items you want to appear in this column. The West Phila. RA reports concentrating its Field Day efforts in the two-transmitter class with operators being AHP, BVD, DVB, FMI, OWK, RKP, VCE, YDB, YHM, and ZIA. The Mike Farad Radio Club, with club station YDX located in the Tech. Rep. Division of the Philco Corp., operates the Mike Farad Traffic Net daily from 12:15 to 1:15 P.M. EST and is on for ragchews every Sat. morning on 3815 kc. Members of the Abington Township Area presently in the armed services took leave in order to be present for Field Day. RFI came all the way from El Paso, Tex., while PDJ drove up from Baltimore. The newest member of the Club is AUF, the son of QV. He will have a 10-meter mobile unit in his 14-ft. outboard boat. Bill Shaw, ex-3AAD, is back on the air with a Viking I and an SX-71, plus a new call, BUR. FPC, NJS, VNP, and VSC, members of the South Phila. AR Club, received citations for their work during Hurricane Hazel. AXA reports the date of the E. Pa. picnic will be Aug. 14th. The place, a central location, will be announced later. The Philmont Mobile Radio Club is planning a documentary film on its activities. With 25 present it walked off with the prize at the Old Timers' Nite Roundup for having the largest club attendance there! Traffic: (Apr.) W3CUL 656, OK 233, BFF 208, WUE 155, OZV 107, UKJ 104, GES 88, DU1 82, YAZ 81, AXA 52, WYV 50, WQL 36, PYP 34, UOE 33, ELI 26, PVP 21, PVP 14, EAN 9, ZBD 9, TTW 8, ABT 5, JNQ 5. (Mar.) W3UOF 35, ELI 23, BES 4.

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA** — SCM, John W. Gore, W3PRL — Maryland has at last been added to the list of states now having laws granting the issuance of automobile call letter license plates. This move was initiated originally five years ago and after having been passed and vetoed twice by the Governor, it finally passed again and was signed by the Governor on Apr. 26, 1955. The Law becomes effective May 1, 1956 and provides that call letter license plates may be displayed only on radio-equipped vehicles. Meetings have been held with the Commissioner of Motor Vehicles Office for the purpose of establishing procedures for applications for tags, and a tentative program has been formulated. However, after some has been finalized, information will be sent to all Maryland amateurs for their guidance. YQD discussed "Simplicity and Portability of 220-Mc. Gear" at the Chesapeake Amateur Radio Club on Apr. 25th. UE is looking for stations north and northwest of Baltimore to QNI on MDD C.D. Nets at 1915 EST on 3650 kc. for traffic-handling. ERW now is active on 20-meter phone from Harundale with a new homemade Minibeam. WPF has a new DX-hound Minibeam antenna. MCG made 66 contacts in 25 sections in the CD Party after his return home from three weeks in New Mexico. WV is considering keeping the MDD Net open throughout the summer instead of closing down as usual. WV was one of the Guests of Honor at the recent Old Timers Round-Up in Trenton. The Eastern Shore Amateur Radio Club presented a movie "Basic Electricity — A Must for the Novice" at the Dutch Inn,

Laurel, Del., on Apr. 29th. BKE is looking for schedules, any band, any time. CDQ is looking for instructors for the Washington Radio Club code class, which is going strong. EEB has returned from a trip to South America and visited KV4AH, PJ2CJ, and CP7NM. DRD is building a new final for a pair of 4-125As. The Pikesville Amateur Radio Klub has just been formed with the station call CBW. RV has been busy assembling test equipment for the building project reported last month. BWT and AKB are temporarily off the air because of moving to a new QTH. PKS has been appointed SEC for the Md.-Del.-D.C. section and WG has been appointed EC for Prince Frederick County. Traffic: (Apr.) W3WG 661, WV 619, WBJ 404, UE 249, MCG 86, COK 83, RV 76, PKC 36, CQS 15, PQ 12, EQK 11, OYX 10, BKE 2, BUD 2. (Mar.) W3ONB 94, MCG 22, HC 18.

**SOUTHERN NEW JERSEY** — SCM, Herbert C. Brooks, K2BGJ — SEC: ZVW, PAM: ZI. Early reports on the April 30th RACES Test indicate high participation and plenty of traffic handled, especially at area level. The Burlington County Radio Club members, under the direction of UA, the Radio Officer and EC for Area 10, installed the equipment at Area 10 Headquarters and manned it during the Test. The Camden County Area was well covered during the test by SJRA mobile units, with EWN directing the net. RG was alternate net control on 3505.5 kc. ZI reports very favorable results in the Mercer County Area. K2CEF is doing a swell job reporting on activities in the Pleasantville-Atlantic City Area. DZU is the proud owner of a Johnson KW. CGP has a new receiver and K2CIR, K2IIBA, and W2INJ also are owners of new equipment. CEF reports increased 2-meter and s.s.b. interest in Atlantic County. K2HBA had received his General Class license. YRW is heard nightly on the 2-meter traffic net. ATJ, Mr. Holly, has a new transmitter. BDA is building a Field Day rig. CFP also is building for the big day. Again DVRA put over a swell Old Timers Nite. JWA is to be congratulated on the swell job he is doing as editor of *DVRA News*. K2HZR has a new 100-watt rig and reports DX worked in addition to traffic handled. K2CPR has received the Empire DX Award for his efforts. Jack also is an Official Observer. HDW is heard consistently on NJN. Many thanks for the fine reports and for the interest shown in the section publicity. Keep up the fine work, fellows. ORA reports increased activity on 6 meters. Traffic: W2RG 288, ZVW 80, K2HZR 75, JKC 71, W2HWD 24, ZI 21, K2BGJ 12, W2ASG 11, K2CPR 5.

**WESTERN NEW YORK** — SCM, Edward G. Graf, W2EJV — Asst. SCM: Jeanne Walker, 2B7B. SEC: UTH/FR. RM: RCF, PAMs: TEP and NAL. NYS meets on 3615 kc. at 6 P.M. and 6:30 A.M.; NYSS on 3595 kc. at 3:30 P.M.; NYS on 3925 kc. at 6 P.M.; NYS C.D. on 3509.5 and 3593 kc. at 9 A.M. Sun.; TCPN 2nd call area on 3970 kc. at 7 P.M.; SRPN on 3970 kc. at 10 A.M.; ISPN on 3980 kc. at 3 P.M. K2DJN and K2DJO were appointed co-chairman of RAWNY Field Day. K2HYZ is spending the summer at Lake Placid. K2CLA says his messages handled should be upped when he gets the 813 perking. UTH has a 20-A s.s.b. exciter. K2CEH has a pair of 826s on 2 meters at 300 watts. The RARA V.H.F. meeting was held at the QTH of ELX. TKO represented W.N.Y. at the 1st annual meeting of the low-frequency RTTY in N.Y.C. A c.d. surprise alert in Erie County saw 80 stations out of a possible 84 alerted in less than one hour. Congrats to SSC for being top man for W.N.Y. in the SS. The wishes of your SCM have been realized with the reactivation of the amateur club in Syracuse and vicinity. The first meeting was attended by 90. Meetings are held at the NMP auditorium the 1st Wed. of each month. The KBT meeting was devoted to Field Day planning. K2BRW is at A.F. Base in South Carolina signing /4 and would like to QSO some of the Lockport, Niagara Falls, and vicinity hams any evening on 7265 kc. after 1900 hours EST. He is operating AF4AFI using a Globe King at 400 watts with a 75-A2 receiver. *Corning QRM* states that Dan Rosetti of the American Red Cross spoke at a meeting on "What to do with a Barbequed Ham." First aid was required to revive a ham after an inadvertent contact with a 3000-volt plate supply. WS is active on 40 meters. CXM was QRP until another Variac could be installed. K2CQO left for France and expects to be on 20 meters soon. New RAWNY officers are JPE, pres.; KLF, vice-pres.; TAX, treas.; ICZ, corr. secy.; K2DJN, rec. secy. PPL and DVD are having fun with 2-meter walkie-talkies. RARA officers for the coming year are CTA, pres.; PFI, vice-pres.; SNI, secy.; ZHB, treas. RARA Mobile Club officers are K2ACO, pres.; AKM, vice-pres.; ZZS, secy.-treas. The next meeting will be devoted to a transmitter hunt with FTF in charge and YUT doing the

hiding. QAA is on with a 150-watt Heathkit. K2AMZ has a new B&W. K2KQK dropped the "N" from his call. MHU and K2LWF are on 6 meters. The speaker at the Elmira meeting was Maj. Bill Fields. KN2LBS is a new ham in Machias. Traffic: (Apr.) W2RUF 609, BNC 164, ZRC 116, K21HVZ 111, DSR 92, CLA 78, W2EMW 74, OE 67, K2DJN 64, W2GBX 61, K2AMZ 48, W2HKA 48, COB 33, IEP 30, RQF 20, ZHU 15, FEB 13, UTH 10, KN2JVH 2, (Mar.) W2ZRC 82, WS 12, K2ZJT 10.

**WESTERN PENNSYLVANIA** — SCM, R. M. Heck, W3NCD — SEC: GEG, RMs; UHN, NRE, NUG, and GEG. PAM: AER and LNE. The WPA Net, UHN manager, will operate on 3585 kc. at 1830 EST during the summer. ZKY and VEF are Field Day co-chairmen for the Bucktail Amateur Radio Club. TYC worked the YL/OM C.W. Contest with 30 watts. OLB is now K2KZJ. KYK is active on 160- and 75-meter 'phone. SUL is 10-meter mobile. LEL is on 3.5-Mc. c.w. and 220-Mc. 'phone with code practice most nights at 2030, 5 to 10 w.p.m. on 223.3 Mc. RMX, on 10-meter mobile, is getting better results with PTU at home trying better 10-meter antennas. ZKY is working out well with 25 watts on 75 meters. The Indiana ARC, using club station BMD, joined with other amateurs in a system of tri-state five-city junior rifle match shooting from Grand Rapids, Detroit, Toledo, Pittsburgh, and Indiana, the winners being determined via reports by amateur radio. VKOD had fine DXing on Apr. 23rd, getting DL4ACW, PYGO, VK3AZY, ZS6TE, KASL, and W4DUZ, plus VK9SP and several ZS stations later that day. The Beaver Valley ARC plans a tour of the Greater Pittsburgh Airport communications, radar, and blind-landing equipment. LPI gave a report on the Toledo s.s.b. meeting. VFR and BSF reported on the Dayton Hamfest. CXX and VFR are mobile. The Cambria County C.D. Net maintained a station, UUY, on the 10-meter defense frequency during the Home Show held in the Johnstown War Memorial Arena. The Breeze Shooters Net, Mon. on 29 Mc. at 8 p.m., has SJK giving code practice for beginners between 7 and 8 p.m. Mon. on 29 Mc. A second station, ZDK, will be on soon with practice sessions on Sat. The South Hills Brass-pounders and Modulators hamfest will be held Aug. 7th at South Park. TFU has been forced to drop his SHBPM newspaper activities. The present staff consists of OMP, QOQ, and ZSP. QNI attended open house at Bethel High School, which has a radio club of its own. VFR visited UJP on 10-meter mobile and in person. NBQ and TTB are on 10 meters. RUX has completed mobile and is on 10 meters with a fine signal. LDB is figuring on adapting his mobile to his truck. VKU is furnishing the truck for the SHBPM Field Day. The Radio Association of Erie has placed its summer hamfest in the capable hands of QPP and NXX. The RAE Field Day will be under the chairmanship of TXZ, assisted by WDK and STK. New calls around Erie are WN3s BUY, BYM, BYR, BVQ, and BQE. The RAE has crystals available for use by the Novices. Traffic: W3NRE 222, LMM 199, UHN 52, GEG 30, KUN 27, NCD 16, SIJ 14, KNQ 13, VKD 12.

## CENTRAL DIVISION

**ILLINOIS** — SCM, George T. Schreiber, W9YIX — Section Nets: ILN, c.w., Mon. through Sat. 3515 kc.; IEN, 'phone, 3940 kc. SEC: HOA, RMs; BUK and MRQ. PAM: UQT, EC Cook County: HPG. The Chicago YLRL observed its second anniversary Apr. 23rd with an open house for the OM and dedicated the club station. DEQ, The President is SEZ, secretary is GME. Speakers at the dedication were LZ, QCWA pres., HPC, Fritz, Franke; Bill Halligan jr.; and your SCM. More than 85 Novices have been graduated from the QCWA code class, which has closed down for the summer. The class totaled an average of 125 per session. Instructors and examiners were CYD, EVA, and MHK. More than 1000 amateurs are represented by the Chicago Area Radio Club Council, it was announced by President HPG. MD values his collection of old-time photographs representing early amateur radio in the section. EPI would like to see a tri-state (Central Division) c.d. drill and talks it up. UQT, the Central Division Director, gets around visiting clubs and ham gatherings. DO, YWL, CSW, IDA, and VSX made BPL this month. It's the 13th BPL for DO. DKW, formerly of the Starved Rock Club, now has plenty of room for skywires, he writes from Prescott, Ariz., and will be on 40 meters soon. ABS is talking about getting on the air from the new QTH in Rock Island. LIC is enjoying 20 meters after more than a year's absence. K4ATN visited Vice-Director QJZ. ZEN, and many others of the down-State gang. ZEN hopes by this time to have his cruiser launched on the Illinois River. PHE had frequency drift in the rig but eliminated it with the help of IFA. Now he is going to tackle repairs to the beam. FRP has moved his shack into a new trailer home. USI now puts out Official Bulletins on 40, 6 and 2 meters as band activity indicates. IDA now is on s.s.b. and likes the s.s.b. session of IEN each Wed. at 1730. PVD obtained a 35-foot pole for a skywire. SKR is busy trying to eliminate chirp in the BC-459. Novice JZK has a new Globe Scout. New Novice calls are PGB and NST. BA has been busy organizing a back-up net in Belleville for the city police; now the sheriff wants the same thing. HUX has his vertical perking and likes it. Congrats to BRD and his XYL on the

arrival of a second jr. operator. If it's a contest you are listening to you always hear GDI, while his brother LI hardly ever stirs from 20 meters. Both KJ and BUK now have their kw. rigs going and BUK won his fight with the Evanston village fathers, who finally gave him permission to erect a 60-foot tower. EVA says we insulted him last month when we associated him with a teletypewriter. It's a teleoperator, he says, which sends out dots and dashes. HPI, one of the leading f.m. exponents, was heard on a.m. and working off the frequency of 147.5 Mc. UD deplores the fact that so many new General Class licensees rush to build modulators. The Cenozoic Amateur Radio Assn. gets out an interesting news letter. Officers of the group are MUO, TLE, and UFR. C.d. seems to be picking up. SEC HOA announced the issuance of EC certificates to GLR, BLO, EAD, SXU, VSX, MRT, and NGG, all active hams. NGG incidentally works a police circuit all day for the State Police at Pontiac but still enjoys hamming. Traffic: (Apr.) W9YWL 856, DO 846, IDA 669, SCW 549, VSX 454, AA 243, SME 132, QQG 116, VHD 54, CEE 42, YLN 40, BUK 34, MRQ 29, ZMJ 26, LXL 22, USI 22, VEY 21, VER 14, CTZ 12, FRP 12, BA 8, PHE 4, STZ 2, (Mar.) W9VSX 203, BA 7.

**INDIANA** — SCM, George H. Graue, W9BKJ — The Indiana Radio Club Council met at Purdue University April 17th. Delegates from 24 clubs approved plans for a section Field Day Contest with a plaque to the winning club. The agenda for the Central Division Convention at South Bend Oct. 15th and 16th was presented. Those making BPL for the month are NZZ, TT, and JUJ. NZZ received the G.E. Co. Hurricane Edison Award for 1954 and also received a plaque from England for traffic-handling for a scientific expedition in the Far North from 1952 to 1954. WVT reports traffic for IEN as 151. EHJ reports CAEN traffic as 35 for 19 sessions. The XYL of SNT is TNV at Stroh. RBV is 2-meter mobile. FJS is the new Vermillion Co. EC. JSV has a code class of 19. N9VAI is new at Rockville. BYN has a new B&W rig. IU has a new Mosley 40 meter beam. BJF made WAS in 5 weeks. N9UBF is new at Elwood. ZGC is rebuilding. AB again is active on IFN daily. WTY is the new station manager of club station AB. RBE is new at Borden with a Viking II. HSG has 614hz in a homebrew rig. NTA reports 50 sessions with a traffic total of 202 for IFN. NTA and GHK took a Cub Scout Troop on a tour to Grassyfork Fisheries. PNE has worked 40 countries on 160 meters. BBE finally has his TR-75 working on 20 meters. FHA has a Viking Adventurer. YZO has WAS on 75-meter 'phone. TT has the new rig working. FB, JUJ may be inactive until September. VNY and KDY are on a vacation cruise in the Mediterranean Sea. DHJ now has seven states worked on 2 meters. N9SIX and TDI are new at Jeffersonville. LSJ has a new VFO. N9RYH is new at Peru. ZIB has a new B&W rig. FSA is active on 6 meters. DKR has an RME-55 converter in the car. FWRC is changing the mobile net from 10 to 6 meters, with about 60 units to change over, plus the same numbers of converters to build under a club project. UDD is heading this change. Traffic: W9NZZ 920, TT 919, JUJ 512, TQC 180, EHJ 138, VNV 120, UQP 96, JBQ 80, WBA 76, TG 62, STC 58, WNV 58, WRO 58, BKJ 57, DHJ 52, ZYK 49, PQ4 47, QYQ 37, NTA 35, CTF 33, QR 31, SVL 26, HRY 23, AZF 21, FGX 19, AQR 13, KDV 12, ZRP 12, CMIT 11, ACN 10, CC 10, DOK 10, GDL 10, AB 8, S 8, ZIB 8, BDP 7, EOO 6, FSA 6, DGA 5, YVS 4, DPR 3.

**WISCONSIN** — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAMs: ESJ and GMY. RMs: IXA, RTP, and UNJ. Nets: BEN, 3950 kc., 6 p.m. daily; WIN, 3685 kc., 6 p.m. daily; WPN, 3950 kc., 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile c.d. frequency: 29,620 kc. CCO worked a KLT and reports he will be leaving for the Navy in October. W9NUGC is new in Plainfield. BTN is running 700 watts to a BC-610. KXA has returned from overseas, and has resumed skeds with OM KWJ from 3PQT. In the April CD Party RKP made 51,695 points while DIK finished with 29,600 points. IU built a new Heath DX-100 transmitter. Net certificates (WPN) were issued to CFO, GHJ, GHT, KKK, KKM, and UTN. WYE has a new Harvey Wells Deluxe and is active on 50 Mc. DVM is using a Viking Ranger, NC-183D, Matchbox, D104, and a VHF-152A. 0TLE was guest speaker at NWRC's April meeting. New officers of the WVRA (Wausau) are JBF, pres.; FZC, vice-pres.; CFN, secy.; LED, treas.; RQM, custodian. TBI, ZJJ, YZS, MQC, and IAL, of Rhineland, and SJL, YUB, and SQJ, of Minocqua, are new members of WVRA. IAL has a new SX-43 and is new MARS member and OBS. ZJJ operated portable from the high school in a demonstration. W9MLO has a TR-75 and an SX-42. W9UMK runs 30 watts to a 6L6 and S-20R. During the Apr. 15th opening on 144 Mc. LEE worked KPS, EQC, EHX, PPA, AAG, QWT, LJV, GFL, and GDP and heard 4PCT. AFS is back on 7 Mc. with a Globe Scout. FIA and AQN are working 4-Mc. 'phone. AFS and QGR are looking for former instructors of AACSS schools at Truax and Scott. ZNA is building a radio-controlled plane. YNB is scouting for DX on 7 Mc. OVO now has the mobile set for rapid band change. New ECs: AJU for Ashland and Bayfield Co., and FFC for Waushara Co. VHA and JBF have handie-talkies in operation on 29,620 kc. Plan now to attend the Central Division Convention at So. Bend, Ind., Oct. 15-16. Traffic: W9CXY 504, SAA 251, CCO 139, FFC 108, BTN

(Continued on page 82)

## "More Roads to Rome Than One"

**S**ELECTIVITY in the last few years has become more and more of a major interest to the radio amateur, not only from a theoretical discussion but also from a practical operating standpoint, because of the recent advent of at least three manufactured receivers offering a degree of selectivity that was unobtainable at almost any price just a few years ago.

**T**HE theoretical analysis and mathematical tools to develop narrow passband systems are not basically new, having been first presented in text form by Shea in 1929. Shea's original work covered filters only from an electrical standpoint, but from his concepts, others (such as Mason in 1942) have developed low-pass, high-pass and band-pass networks for acoustic and mechanical systems. Today, therefore, the electronic engineer has quite a few choices as to the method of achieving the selectivity requirements of the customer.

**I**N a theoretical radio receiver, the ideal location for all the selectivity is directly after the antenna and before the first tube of the receiver. As yet, no one knows a practical method of obtaining the required high order of selectivity that is also tunable over a wide band of frequencies. Hence the practical receiver obtains some selectivity in successive stages by variable tuned circuits until the signal is converted to a convenient fixed intermediate frequency at which point the maximum and final selectivity is obtained.

**A**T the I.F. frequency the designer has the choice of only two basic systems and each is composed of resonant elements: the first — electrical resonance and the second — mechanical resonance. To some it may seem somewhat strange if quartz crystals are used in the filter; the filter should be properly described as a "mechanical filter" as the piezo-electrical properties of quartz actually cause a change in the shape of the filter element and therefore the crystal is mechanically vibrating at some specific frequency.

**T**HE corollary can be drawn that other materials exhibiting similar characteristics, such as the magnetostriction effect, could also be employed as filter elements. However, magnetostriction effect, at present, is used mainly for transducer elements in certain mechanical filters. Certain Ferro-ceramic compounds are useful in filters only because of this magnetostriction effect.

**F**OR most amateur work it is a practical necessity that the degree of selectivity be varied over a fairly wide range to encompass different modes of transmission and different band conditions. Thus the design engineer is now faced with another decision: Which of the two basic types of filter systems will meet the customer requirements better and still be economically practical? Of even greater importance, which of the two systems is worthy of further research for possible application to amateur receivers and transmitters?

**A**T the present state of the art the only system whose passband can be varied over the necessary range without complete substitution of a new network is the "electrical." The mechanical systems offer somewhat better skirt selectivity (for a given physical size) but at a considerable increase in cost and, to change the passband, complete additional filters must be added. Thus, at the present date, it seems that the electrical system is way out ahead from the important cost point.

**T**HE well-known bandwidth formula  $BW = \frac{F_r}{Q}$  clearly shows that when  $Q$  can be maintained the electrical systems are primarily for low frequencies, 25 to 200 kc. At these frequencies a mechanical filter becomes quite large. For example — some 50 kc. filters that we made were  $\frac{1}{2}$ " x  $\frac{1}{2}$ " x 14". At higher frequencies the physical size of mechanical resonating elements becomes so minute that production problems become insurmountable. Thus, mechanical filters employing elements other than quartz are practical at present only in the frequency spectrum from about 250 to 700 kc.

**F**OR the higher frequencies we have only one alternate to consider, and that is mechanical filters employing the piezo electric effect. Of all the materials exhibiting this effect only quartz has the necessary physical properties, permitting the fabrication of thin, small elements which can be combined into a filter network. The upper frequency limit of quartz filters is quite high and may reach as much as 15 to 20 Mc.

**T**HE fabrication of quartz crystals has progressed amazingly since 1940 and, likewise, the scientific knowledge of the application of quartz elements in bandpass networks. It seems logical, therefore, that further research may soon find methods of obtaining adjustable passbands with one crystal network, thus affording a very versatile new device for the design engineer.

—Fritz Franke

*Bird Halligan, Jr.*

*W. J. Halligan W9AC*

for **hallicrafters**

# NOW

# a BROAD-BAND\* LINEAR

MULTIPHASE  
**600 L**  
NO TUNING  
CONTROLS

SINGLE KNOB  
BAND-SWITCHING  
10-160

FOR USE ON  
SSB, AM, PM & CW



WIRED, WITH TUBES AND  
BUILT-IN POWER SUPPLY **\$349.50**

## a new concept in linears

CENTRAL ELECTRONICS takes pride in presenting a product of intensive research — the new Multiphase 600L Broad-band\* Linear. "It is destined to change the entire concept of RF amplifier design in the military, commercial and amateur fields." There are no tuning controls, servos or moving parts other than band-switch.

- Single 813 in Class AB<sub>2</sub>.
- New band-pass couplers provide high linear efficiency: 60 to 65%.
- Designed for 50 — 70 ohm co-axial input and output.
- Easy to drive — Approx. 2 watts effective or 4 watts peak drive power required for 500 watts DC input.
- Built-in power supply — bias and screen regulation, 45 mfd. oil filled paper output capacitor. Excellent static and dynamic regulation.
- Extremely low intermodulation distortion.
- Automatic relay protects 813 and RF couplers.
- Excellent stability — complete freedom from parasites.
- Effectively TVI suppressed — RF compartments thoroughly shielded and Hypassed.
- Choice of grey table model, grey or black wrinkle finish rack model.
- Table model cabinet size — 17 $\frac{1}{8}$ " W, 8 $\frac{3}{4}$ " H, 13" D.



## Another C.E. First!

METER FEATURES NEVER BEFORE  
FOUND IN A TRANSMITTER

- Reads power input directly in watts
- Reads grid current
- Instantly reads output in RF amperes — no lagging thermocouple
- Indicates reflected power caused by mismatched load
- Calibrated input levels for AM, PM and CW.  
... and switch the meter to any position while transmitting!

\*PATENT PENDING

**WRITE FOR LITERATURE**

MULTIPHASE  
  
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*Central Electronics, Inc.*

1247 W. Belmont Ave.

Chicago 13, Illinois

Watch for early announcement of other new  
CENTRAL ELECTRONICS  
equipment.



**MODEL AQ**



**MODEL DQ**



**MODEL B SLICER**

# NEW MULTIPHASE "Q" MULTIPLIER AVAILABLE THREE WAYS

1. It's built-in the new Model B Sideband Slicer.
2. Plug it into your present Model A Slicer.
3. Attractive Desk Model, for installation directly into receiver.

The new Multiphase "Q" MULTIPLIER is a tunable IF electronic filter that provides tremendous receiver selectivity for peaking or rejecting a signal on AM, CW or SSB. It employs a new two tube circuit\* with a special very high "Q" pot core inductor. Continuously variable selectivity from 60 cps to normal IF pass-band. Nulls out interfering heterodynes without affecting speech intelligibility. Peak the desired signal; interfering carriers are attenuated up to 50 db.

\*PATENT PENDING



**MODEL 20A**

- 20 Watts Peak Envelope Output SSB, AM, PM and CW
- Completely Bandswitched 160 thru 10 Meters
- Magic Eye Carrier Null and Peak Modulation Indicator

Choice of grey table model, grey or black wrinkle finish rack model.

Wired and tested.....\$249.50  
Complete kit.....\$199.50

## 458 CONVERSION KIT

Basic 458 Conversion Parts Kit, 15 to 160 meters, with dial, etc.....\$15.00  
458 Deluxe Case and Panel Kit, matches size and appearance of Slicer...\$10.00

## NEW — FOR 10 METERS

MODEL 458-10 xtal controlled converter package to extend 458 VFO into 10 meter band. For use with above 458 Conversion Kits.  
Wired.....\$37.50  
Kit.....\$27.50

## MODELS MODEL AQ

"Q" MULTIPLIER for installation in Model A Slicer. Includes new front panel. Power-IF cable plugs into accessory socket.

Wired...\$29.50 Kit...\$22.50

## MODEL DQ

Desk Model "Q" MULTIPLIER for use with any receiver having 450 to 500 KC IF. In attractive case 5 1/2" W, 4" H, 5" D, with connecting power-IF cable. Power requirements, 225 to 300 VDC at 12 ma., 6.3 V at .6 amps, can be secured from receiver. Can provide added selectivity and BFO for mobile SSB or CW reception.

Wired...\$29.50 Kit...\$22.50

## MODEL B

Sideband Slicer, same as Model A Slicer but includes built-in "Q" MULTIPLIER. AP-1 not needed.

Wired.....\$99.50  
Kit.....\$69.50

## Check These Features NOW IN BOTH MODELS

- **Perfected Voice-Controlled Break-in** on SSB, AM, PM.
- **Upper or Lower Sideband** at the flip of a switch.
- **New Carrier Level Control.** Insert any amount of carrier without disturbing carrier suppression adjustments.
- **New Calibrate Circuit.** Simply talk yourself exactly on frequency as you set your VFO. Calibrate signal level adjustable from zero to full output.
- **New AF Input Jack.** For oscillator or phone patch.
- **CW Break-in Operation.**
- **New Gold Contact Voice Control Relay.** Extra contacts for muting receiver, operating relays, etc.
- **Accessory Power Socket.** Furnishes blocking bias for linear amplifier and voltage for optional VFO (Modified BC458 makes an excellent multiband VFO.)
- **40 DB or More Suppression** of unwanted sideband.

## SIDE BAND SLICER

### MODEL A IMPROVES ANY RECEIVER



Upper or lower sideband reception of SSB, AM, PM and CW at the flip of a switch. Cuts QRM in half. Exalted carrier method eliminates distortion caused by selective fading. Easily connected into any receiver having 450-500 KC IF. Built-in power supply. Reduces or eliminates interference from 15 KC VFO receiver sweep harmonics.

Wired and tested.....\$74.50

Complete kit.....\$49.50

## AP-1 ADAPTER

Plug-in IF stage — used with Slicer, allows receiver to be switched back to normal.

Wired and tested, with tube....\$8.50

## NEW AP-2 ADAPTER

Combined AP-1 and xtal mixer. Allows Slicer to be used with receivers having 50, 85, 100, 915 KC and other IF systems. One xtal suffices for most receivers.

\$17.50



## MODEL 10B

### SUCCESSOR TO THE POPULAR MODEL 10A

- 10 Watts Peak Envelope Output SSB, AM, PM and CW
- Multiband Operation using plug-in coils.

Choice of grey table model, grey or black wrinkle finish rack model. With coils for one band.

Wired and tested.....\$179.50  
Complete kit.....\$129.50

## QT-1 ANTI-TRIP UNIT

Perfected Voice Operated Break-in with loudspeaker. Prevents loud signals, heterodynes and static from tripping the voice break-in circuit. All electronic — no relays. Plugs into socket inside 20A or 10B Exciter.

Wired and tested, with tube....\$12.50

WRITE FOR LITERATURE

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See Trade Publications on Multiphase "REJUV-A-TUBE" — A New CRT REJUVENATOR



# New Heathkit VFO KIT

MODEL VF-1

**\$1950**

Ship. Wt. 7 lbs.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model

AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical

and electrical design insures operating stability. Coils are wound on heavy duty cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

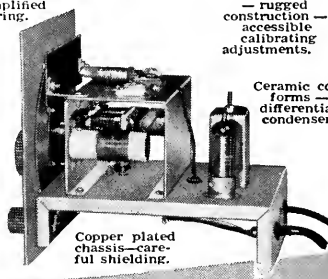
This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard 1/4" crystal holder. Construction is simple and wiring is easy.

- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

Open layout—easy to build—simplified wiring.

Smooth acting illuminated dial drive.

Clean appearance—rugged construction—accessible calibrating adjustments.



Ceramic coil forms—differential condenser.

Copper plated chassis—careful shielding.

## Heathkit AMATEUR TRANSMITTER KIT



MODEL AT-1

**\$2950**

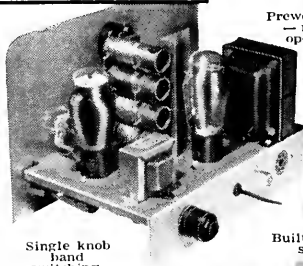
Ship. Wt. 16 lbs.

### SPECIFICATIONS:

Range 80, 40, 20, 15, 11, 10 meters.  
6AG7 ..... Oscillator-multiplier.  
6L6 ..... Amplifier-doubler  
5U4G ..... Rectifier.  
105-125 Volt A.C. 50-60 cycles 100 watts. Size: 8 1/2 inch high x 13 1/2 inch wide x 7 inch deep.

Crystal or VFO excitation.

Rugged, clean construction.



Prewound coils—metered operation.

52 ohm coaxial output.

Single knob band switching.

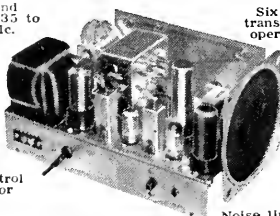
Built-in power supply.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

## Heathkit COMMUNICATIONS RECEIVER KIT

Four band operation 535 to 35 Mc.

Stable BFO oscillator circuit.



Six tube transformer operation.

Electrical bandspread and scale.

RF gain control with AVC or M.V.C.

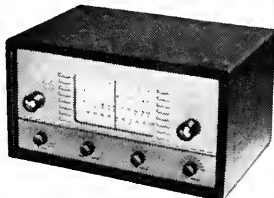
5 1/2 inch PM Speaker-Headphone Jack.

Noise limiter—standby switch.

### SPECIFICATIONS:

Range.....535 Kc to 35 Mc  
12BE6 ..... Detector-oscillator  
12BA6 ..... I. F. Amplifier  
12AV6 Detector—AVC—audio  
12BA6 ..... B. F. O. oscillator  
12AF ..... Beam power output  
5Y3GT ..... Rectifier  
105 - 125 volts A. C. 50-60 cycles, 45 watts.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.



MODEL AR-2

**\$2550**

Ship. Wt. 12 lbs.

### CABINET:

Proxylon impregnated fabric covered plywood cabinet. Shipp. weight 5 lbs. Number 91-10, \$4.50.

**HEATH COMPANY**  
BENTON HARBOR 9, MICHIGAN



## New HEATHKIT DX-100



MODEL DX-100

Shpg. Wt. 120 lbs.

**\$189.50**

Shipped motor freight unless otherwise specified. \$50.00 deposit with C.O.D. orders.

- R.F. output 100 watts Phone, 125 watts C.W.
- Built-in VFO, modulator, power supplies. Kit includes all components, tubes, cabinet and detailed construction manual.
- Crystal or VFO operation (crystals not included with kit).
- PI network output, matches 50-600 ohms non-reactive load. Reduces harmonic output.
- Treated for TVI suppression by extensive shielding and filtering.
- Single knob bandswitching, 160 meters through 10 meters.
- Pre-punched chassis, well illustrated construction manual, high quality components used throughout—sturdy mechanical assembly.

## PHONE AND CW TRANSMITTER KIT

This modern-design Transmitter has its own VFO and plate-modulator built in to provide CW or phone operation from 160 meters through 10 meters. It is TVI suppressed, with all incoming and out-going circuits filtered, plenty of shielding, and strong metal cabinet with interlocking seams. Uses pi network interstage and output coupling. R.F. output 100 watts phone, . . . . . 125 watts CW. Switch-selection of VFO or 4 crystals (crystals not included).

Incorporates high quality features not expected at this price level. Copper plated chassis—wide-spaced tuning capacitors — excellent quality components throughout—illuminated VFO dial and meter face—remote socket for connection of external switch or control of an external antenna relay. Preformed wiring harness—concentric control shafts. Plenty of step-by-step instructions and pictorial diagrams.

All power supplies built-in. Covers 160, 80, 40, 20, 15, 11 and 10 meters with single-knob bandswitching. Panel meter reads Driver Ip Final Ig, Ip, and Ep, and Modulator Ip. Uses 6AU6 VFO, 12BY7 Xtal osc.-buffer, 5763 driver, and parallel 6146 final. 12AX7 speech amp., 12BY7 driver, push-pull 1625 modulators. Power supplies use 5Y4 low voltage rect., 6AL5 bias rect., 0A2 VFO voltage reg., (2) 5R4GY hi voltage rect., and 6AQ5 clamp tube. R.F. output to coax. connector. Overall dimensions 20 $\frac{3}{4}$ " W x 13 $\frac{3}{4}$ " H x 16" D.

## Heathkit ANTENNA COUPLER KIT



MODEL AC-1

**\$14.50**

Shpg. Wt. 4 lbs.

Poor matching allows valuable communications energy to be lost. The Model AC-1 will properly match your low power transmitter to an end-fed long wire antenna. Also attenuates signals above 36 Mc, reducing TVI. 52 ohm coax. input—power up to 75 watts—10 through 80 meters—tapped inductor and variable condenser—neon RF indicator—copper plated chassis and high quality components.

## Heathkit GRID DIP METER KIT



MODEL GD-1B

**\$19.50**

Ship. Wt. 4 lbs.

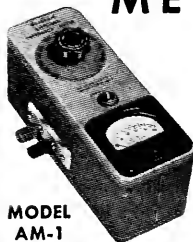
with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

The Invaluable Instrument for all Hams. Numerous applications such as pre-tuning, neutralization, locating parasites, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1 $\frac{1}{2}$  meter Ham bands. Complete frequency coverage from 2—250 Mc. using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at \$3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial

## Heathkit ANTENNA IMPEDANCE METER KIT



MODEL AM-1

**\$14.50**

Shpg. Wt. 2 lbs.

7" long, 2 $\frac{1}{2}$ " wide, and 3 $\frac{1}{4}$ " deep. An instrument of many uses for the amateur.

Use the Model AM-1 in conjunction with a signal source for measuring antenna impedance, line matching purposes, adjustment of beam and mobile antennas, and to insure proper impedance match for optimum overall system operation. Will double, also, as a phone monitor or relative field strength indicator.

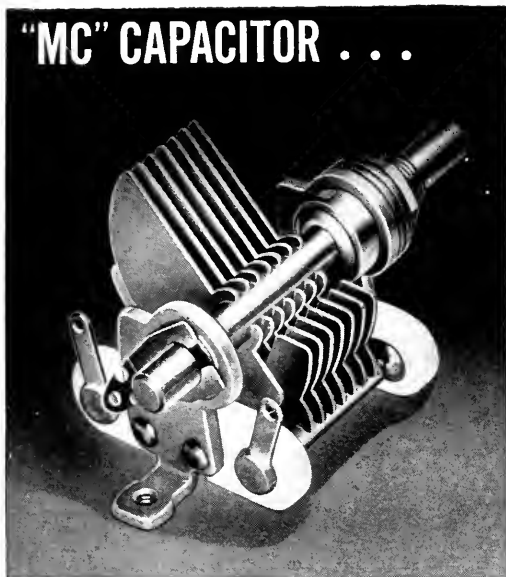
100  $\mu$ a. meter employed. Covers the range from 0 to 600 ohms. Cabinet is only

# HEATH COMPANY

A SUBSIDIARY OF DAYSTROM, INC.  
BENTON HARBOR 9, MICHIGAN



# "MC" CAPACITOR . . .



## Offers Wide Choice of Characteristics!

The "MC" is a versatile single-section tuning capacitor designed to give a choice of mountings, connections and capacity characteristics. The threaded brass front-bearing and tapped aluminum end-brackets permit panel or base mounting. A rotor stop permits 180° clockwise rotation for increasing capacity. For optimum performance all Hammarlund "MC" capacitors have silver-plated beryllium copper wiping contact, silicone-treated seatite insulation, soldered nickel-plated brass rotors and stators. The rotor shaft is supported on bearings at both front and rear of capacitor. "MC's" are available with capacities ranging from 5.5 mmf. to 320 mmf.



The Hammarlund Capacitor Catalog lists the complete line of standard capacitors sold by responsible dealers from coast to coast. For your free copy, write to The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1, New York. Ask for Bulletin C-7.

# HAMMARLUND

(Continued from page 76)

92, RTP 64, IXA 47, SZR 41, KWJ 34, GMY 24, RQM 16  
UTV 15, UIM 14, YZA 10, DIK 9, BVG 8, IJU 5, AEM 2  
RKP 2.

## DAKOTA DIVISION

**SOUTH DAKOTA** — SCM, J. W. Sikorski, W0RRN — Asst. SCMs: Earl Shirley, 0YQR, and Martha Shirley, 0ZWL. SEC: GCP. PAMs: GDE, BNA, NEO, and PRL. RM: SMV. More than 50 amateurs and civil defense officials met at Mitchell Apr. 17th to make plans for amateur participation in emergency communications. OXC was elected State Amateur Radio Officer and a committee consisting of GDE, PRL; RRN, YQB, GCP, HYQ, and DKJ was appointed to assist him in emergency planning. SMV is trying out a vertical antenna. KXZ signed 5 new ARV members and an Assistant EC for Brookings County. The South Dakota Convention, sponsored by the Prairie Dog ARC, is scheduled for Sept. 3-4 at Yankton. Prizes, in order of scoring, in the second annual SODAK QSO Party were won by PRL, RMK, GDE, TAS, SCT, BNA, IUK, DIY, TYC/0, ZWL, NWM, MZJ, and CTZ. Ray Lischka, ex-00JQ, is operating 14 Mc. from Greenland as KG1FR and DTB, operating as KNSGN, wants skeds with South Dakota. New calls: KN0AOR, and KN0ACX. Net reports: NJQ Net, average QNI 20, traffic daily average 4.5; SD-75, total QNI, 1196, traffic daily average 8; 150 Net, April 1-15, QNI 152, traffic 13. The 160-Net has suspended operations until Oct. 1. Traffic: W0SMV 153, GDE 114, GCP 55, SCT 44, BNA 28, BQH 27, RRN 11, AYD 9, RSP 4.

**MINNESOTA** — SCM, Charles M. Bove, W0MXC — Asst. SCM: Vince Smythe, 0GGQ. RMs: DQL and KLG. PAMs: JIE and UCV. The St. Paul Radio Club held its annual election. Results were: TRD, pres.; LPX, vice-pres.; PAK, secy.; and EUW, treas. After a nice trip along the California Coast QNY and his XYL returned full of vigor and set up a new net to cover Northern Minnesota. It is to be known as the Koochiching Emergency Net and meets Thurs. evenings on 3930 kc. for traffic and emergency drills. This will make a total of nine nets operating in this section. The Marshall Hamfest sure was a big success with an attendance of over a hundred hams from Minnesota and the Dakotas. Principal speakers were Division Director PHR, SEC GTX, and Civil Defense Director Mathies. TLE gave an excellent talk on s.s.b.s.c. with demonstrations on its operation. URQ displayed some of his emergency transceivers that he had written up in one of the trade magazines. KJZ says the YLs are planning a YL net on 3838 kc. to meet at 11:00 A.M. on Tue. It will be called "The PI Net." BUO has built a 5BP1 into his rig for a modulation monitor. The Single-Sidebanders had a big day at Willmar with a big dinner and plenty of speakers. According to SW the only way to get the greatest occupancy of the existing bands is to operate s.s.b. VBD has a new wired and TVI-tested Viking II on the air. QDP built a two-element beam for 15 meters. 7RNV has been mobilizing in the State and has been working a lot of the gang. TQQ is back home after a three-month vacation in Hawaii. MXC and his XYL attended a Hawaiian mobile club meeting while out there. The KH6s use 40 meters on their mobile hunts. CO has a new 75-A4 and is chasing 10-meter DX. LUX built a new four-element beam for 20 meters. Traffic: W0KLG 228, MVH 159, KJL 139, QDP 130, WMA 116, DQL 97, TKX 89, IRJ 71, KJZ 67, KFN 62, TUS 55, MVJ 52, RVD 46, HGW 45, GTX 36, MBD 34, UCV 32, LST 28, HUX 27, RLQ 27, LUX 23, OSJ 17, HKJ 14, UKY 14, VBD 14, BUO 11, KNR 11, FOA 10, TOK 8, OPA 7, MXC 6, PUO 6, LIG 5, QVR 5, VCU 5.

## DELTA DIVISION

**ARKANSAS** — SCM, Owen G. Mahaffey, W5FMF — New appointees are VAN, CAF, and MU as ECs; JZL and WUN as ORS; and TIA as OES. YHT writes from Germany that he is in the Air Force Signal Corps operating DL4TA with 500 watts on 20 meters, usually on 14,190 or 14,310 kc., and hopes to hear some of the gang. YZI reports his code class at the Ozark Academy is about ready for the Novice Class examinations. Both the c.w. and 'phone nets are getting along in fine shape, so get your traffic on 3790 or 3810 kc. and we can put it almost any place. Gang, let's have more news. Radio clubs, please appoint a reporter to send in the news. Traffic: (Apr.) W5CAF 64, SXM 47, WUN 44, FMF 23, PX 3, JZL 2. (Mar.) W5SXM 26.

**LOUISIANA** — SCM, Thomas J. Morgavi, W5FMO — A single-sideband dinner was held at Baton Rouge with ABS, ACS, DLA, EKY, DGB, GXO, KC, IMT, VEU, SUM, HHT, LFF, UKQ, MWP, MUG, NOII, ZNI, ZSP, and 9NMI/5 attending. All were presented "3900 Club" certificates and are charter members. The picnic on Sunday, with an attendance of 250, was highlighted by many activities, including a meeting of all ARRL CD appointees. TKV and RRO are new ECs. FKA, now OPS, is the Mayor of Lindsay. SQI made WAS and WAC. NG, our RM, is trustee for the University High RC. He is busy building an 813 p.p. c.w. final. VIC's jr. operator took the Novice Class exam. UGJ now is an OPS. MXQ is the proud owner of a PE201. UGJ is going mobile. PQD wants to trade a tri-band for a

(Continued on page 84)

# THE HQ-140-X...

**KEEPS NOISE OUT!  
KEEPS SIGNALS IN!**



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**FREQUENCY STABILITY**—less than .01% frequency drift after warm-up anywhere from 540 Kc to 31 Mc.

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The HQ-140-X is available either as a cabinet model, or for rack-mounting. For complete details, write to The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1, N. Y. Ask for Bulletin R-7.



# HAMMARLUND

SINCE 1910

2-meter Gonset converter. KSI, ex-K6AFW, is on 40, 20, and 15 meters looking for W6 buddies in Southern California. New mobiles in Lake Chabos include DOE, UGJ, GFA, and ZAK. ARG, ARH, and ARI are new KN5s. APH is rebuilding the rig to high power. BWZ is building a new ham shack. IIQ is a new ham at Hackberry. BMK hopes to have a new DX-100 on the air before long. The S. W. La. Emergency Net held a picnic hamfest the first part of June. ORS, OPS, EC, OO, and other appointments are open over the entire State. Drop a line to the SCM, RM, or PAM for details and applications. Thanks for the reports and keep them coming. Interest is rising in emergency communications and nets. Several good emergency nets are now in operation and a few more are getting started. Traffic: (Apr.) W5NDV 219, MXQ 149, EA 98, NG 86, SQI 18, UGJ 10, YDC 6. (Mar.) W5KRX 180, NG 133, NDV 49, SQI 6, VIC 6.

**MISSISSIPPI** — SCM, Julian G. Blakely, W5WZY. SEC: PFC. RM: WZ. PAM: JHS. MRN-NCS: IGW. The EC program still is under way and applications are being processed each day. A few of the active ECs are: W5OTD, VQE, EWE, KYC, IHP, LPG, DAT, VME, ZYO, ZNY, WZZ, YBH, KNA, AKM, GG, DT, RLP, NPO, JJA, ART, and FKS. The Mississippi Rebel Net has a few openings to give more complete coverage. Check in with IGW at 7 p.m. on 3785 kc. daily. The Interstate Net, with EWE as NCS, still is doing business, with 135 stations checking in this month. Congratulations to 9APY/5 on winning the section award for c.w. in the last Sweepstakes with 72,371 points. ONL/5 followed right behind with a score of 35,105. Both ran less than 100 watts. WZY claimed the section 'phone award with 14,000 points. EWE has joined the mobile ranks. WZ has a new transmitter on the air. RIM really clears the frequency with his kw. IGW is running high power, 400 watts complete break-in with a heterodyne VFO. Traffic: W51GW 197, EWE 145, VME 109, YFJ 105, JHS 50, EDE 48, WZY 36, KYC 24, RNB 23, RIM 15, YBH 11.

**TENNESSEE** — SCM, Harry C. Simpson, W4SCF — SEC: RRV. PAM: PFP. RM: WQW. PHQ announces that a Bull Throaters Award will be given to the Hillbilly Net member making the highest score in a 3-month period. The Bays Mountain Club is going strong. TYU received a GE Hurricane Citation. VNE received his DXCC, his third postwar DXCC (others were overseas stations). UWA sends a nice bulletin from the Cookeville ARC and reports the Upper Cumberland Net has been discontinued. SGU, WXL, ETJ, APD, UWA, BER, WIJ, ZJY, and BWQ had a Field Day dry run. PVD visited NJE and VJX. WOX and YRI have a new s.s.b. rig. WQT demonstrated a Sideband Slicer to the Clarksville Club. CVM worked 130 stations in the CD Contest before becoming ill, but WQT upheld the tradition by rolling up 69,750 points. After having been General Class only 60 days, K4ACG already had 20 countries. W8RUW/4 has shipped out to Germany. KFK and MSZ are going RTTY on 80 and 40 meters. RN5 Mgr. OGG reports 50 sessions with 12.5 QTC average. TDZ says the Chattanooga 10-meter Net is going nicely. UIQ is building a 75-meter mobile which will QSY the entire 'phone band from up front! UOA and DZW had an exhibit at the Science Fair at Vanderbilt. PRY has resigned as NCS of the Davidson County 10-meter Net. OEZ has announced DMU will be the replacement. The Humboldt ARC has received its ARRL charter of affiliation. CLS is president, IGW secretary. HQM and WCI are building 10-meter mobiles. Another new affiliate is the Watauga ARC, Johnson City, whose secretary, KN4ARZ, announces that club meetings are held the 2nd and 4th Mon. During the Memphis flash flood LVW and FRB used their boats for evacuation. BAQ, UDI, BCA, DCH, CRP, DIX, PKI, SCF, BAO, AFB, WTL, JU, and IQX assisted with traffic and reconnaissance. Six-meter activity is looking up, with HHK, 9FFF/4, FGG, NMM, YEL, BAQ, PJG, and VDW either on the air or in the process. His many friends will be sorry to hear of the death of BYN. Traffic: W4PL 1095, OGG 671, K4FEU 539, W4TYU 319, IIB 104, TZD 97, PFP 94, YMB 82, HIIH 63, WQW 63, SCF 59, VJ 41, SJ 33, CXY 25, IV 25, UOA 22, VNU 20, RRV 19, RMJ 16, BZQ 16, UVS 15, UVP 12, NDC 10, YPG 8, HUT 7, SON 5, TIE 5, YXA 5, DCH 4, LRO 2, TDZ 2, ARZ 1, CLQ 1, DMU 1, IGW 1, KFK 1, PVD 1, RHK 1, UIO 1, WOX 1, WQT 1, YRI 1.

## GREAT LAKES DIVISION

**KENTUCKY** — SCM, Robert E. Fields, W4SBI — SEC: CDA. RM: KKW. Acting PAM: NIZ. The newly-organized KPN (Kentucky 'Phone Net) shows the following statistics for the month of April: Average number stations per session, 19.833; average messages handled per session, 4; total number stations participating, 595; total messages cleared, 121; stations participating, 50 per cent or more, 13; 20 per cent or more, 23; 10 per cent or more, 34. Activity for March of the KYN (Kentucky C.W. Net) shows these figures: 75 sessions; traffic total 310, with an average of 4.01 per session; 48 active stations. ZDA and ZDB make up an OM-XYL team on the KYN as both are NCS. BAZ is working on plans to get Kentucky's first RACES net started with civil defense in Frankfort. JUI has been working 20 meter DX lately. WNIH is mobile on 80, 40, 20, 15, and 10 meters. According to JHU, the Logan County Novice Net has been changed to the Kentucky Novice Net (KYNN).

All Novices in Kentucky and surrounding states are cordially invited to participate. Stations which call into the net will be put on the roster and later sent a copy of the roster. The net time is 2 p.m. CST each Sun. on 3735 kc. Traffic: W4KKW 207, NIZ 128, SBI 112, ZDB 56, RPF 48, CDA 44, ZLK 43, QCD 42, SUD 40, ZDA 36, JHU 28, K4FAV 21, W4LXA 18, BAM 15, SZB 12, OMW 9, JUI 4, WBD 4.

**MICHIGAN** — SCM, Thomas G. Mitchell, W8RAE — Aast. SCMs: Bob Cooper, 8AQA (phone); Joe Beljan, 8SCW (c.w.). SEC: GJH. New appointees are AJJ as OPS and HFA as OES. Congrats to both. The Allegan V.H.F. Picnic date has been changed to Aug. 14th. Fewer stations reported traffic this month, but our total is about the same as for March. The biggest news for this report is that the Michigan ComPlan for RACES has just been approved by the FCC and FCDA. This plan has been in the works for five years and represents the efforts of our SEC and his associates over that period. Our thanks to them for the work to date, but the job of forming a working RACES organization requires the support of stations in this section. To all who have been waiting and wondering what we in Michigan are doing about our role in c.d., here is your chance to offer your services and become RACES licensed stations. Remember, in the event of an emergency, only RACES licensed stations will be allowed to operate. Register via AREC registration forms, which are available from this office or from any EC. As yet, the ComPlan has not been coordinated with the Michigan Office of Civil Defense (MOCD), but this work is in process and printed copies will be circulated through the AREC organization to all concerned. TBP and TIC both report EC activity continuing in the Muskegon Area. FX, still waging war on demon line noise, is longing for a rural QTH like HKT's. IUJ is back after his operation, as his traffic total indicates. AQA is the new vice-chairman of his AIEE section and is very QRL. PHM is going into MARS work and PHA regrets that he can't use his MARS traffic totals on the Form 1 reports. WXO has been QRT overhauling the rig and rebuilding the antenna that "went with the wind." NUL's new buffer stage puts him up in the 35-watt class and PDF is QRP because of loss of his final plate transformer. Traffic: (Apr.) W8NOH 320, PHA 243, NUL 173, SRK 165, ILP 152, IRO 119, IBB 93, DAP 87, ZLK 85, NTC 66, FX 65, WVL 65, DLZ 58, SJF 58, SWG 51, QIX 40, QXO 37, HSG 34, IUJ 33, RAE 30, IV 29, ZHB 21, AQA 14, PHM 14, PDF 12, SCW 9, HKT 8, MQG 8, INF 7, AUD 2. (Mar.) W8TBP 11, INF 7, WXO 7.

**OHIO** — SCM, John E. Siringer, W8AJW — Aast. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8JNF; and E. F. Bonnet, 8OVG. SEC: UPB. RMs: DAE and FYO. PAMs: EQN and HUX. JDN and JHH are new OPs. On Apr. 30th the OCARC met in Columbus. The Council will award both club and individual trophies in future ARRL DX Contests. Officers elected were HNP, chairman; GQ, vice-chairman; VHO, secy.; and AL, treas. DAE makes BPL for the third successive month, the fourth Ohio amateur to qualify for the BPL medallion. EQN, OCARC Contest Manager, reports the following scores in the Ohio Intrastate QSO Party: AJW-7295, JHH-4300, MEI-2210, JDN-2040, PJ-1564, TAQ-1218, VTP-936, EQN-561, MQQ-345, AL-336, HUX-320, BTW-288, LGY-272, JDC-240, RO-198, DAE-150, JSV-130, BEW-130, GHT-60, DCJ-42, FRD-40, YPP-16, THJ/M-12, CRA-9, IFX-4, EPB-1. The unofficial club winner was Foresta Jr. with 7643 points. We deeply regret the death of HIF, EC for Lucas County and Aast. C.D. Communications Officer to HNP in the Toledo Area. The Springfield Radio Club has become incorporated. On June 12th the Tusco group held a mobile roundup and summer hamfest at Dover Fairgrounds. Amateur Radio Week in Ohio, as proclaimed by Governor Lausche, is scheduled to include ARRL Field Day week end. The old-fashioned hamfest of the Findlay Radio Club will be held Sept. 11th. The Dog House Net elected PQQ, pres.; TJD, vice-pres.; CRS, secy.; and HUX, treas. On April 17th the Toledo Mobile group conducted a successful scrap drive to help defray the high costs of Field Day. New Novices in the Dover/New Philly Area are VXA, VTR, WFE, WFJ, and WMI. HNP was instructor in radio and communications at the Camp Perry C.D. meeting on May 14th. K8FAD is the call of the Wright-Patterson AFB Radio Club. GDQ, of 160-meter DX fame, was appointed Lorain Co. c.d. amateur radio operator. The Lorain Co. Amateur Radio Assn. elected LCE, pres.; OYN, vice-pres.; VMD, secy. Medals were awarded AJW and BF, CWA horseshoe-pitching champs, by JNF. The Intericity gang elected HTO, pres.; OZZ, vice-pres.; and QXD, secy. May QST reported HPP as having a romantic interest. This was a tremendous understatement as she has been elected queen and sweetheart of the Lockbourne AFB. The OVARA *Ether Waves* reports that a picnic is scheduled for June 12th. GCARA's Mike & Key informs us that twenty 10-w.p.m. code certificates have been issued to the present code class. According to its good bulletin *Key Klitz and Feed Back*, the Hooking Valley Radio Club is building up the club treasury by a project of raffling off fishing gear. Dayton's *RP Carrier* informs us that 6-meter activity is gaining in the area with HOH, INQ, and NEE leading the way. RCJ advises that PTS is in charge of a new code and theory class for the Lake-

(Continued on page 86)

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Geauga Club. Hamilton's *Feedline* states that OFL was chief speaker at the last meeting. The Club meets the 1st Fri. of each month at the YMCA. Springfield's Q-5 informs us that the annual banquet was a screaming success with Gen. Mgr. Budlong, Director Brabb, and UPB, the SEC, in attendance. This group meets at the local YMCA. Write DCJ for particulars. Toledo's *Shack Gossip* reports RZV passed his General Class exam; TTY moved from Perrysburg to Toledo and new Toledo Radio Club officers are BIQ, pres.; BN, vice-pres.; RZQ, rec. secy.; RBX, corr. secy.; and RZMI, treas. The Columbus *Carascope* relates that WAB, former CARA member, is prexy of the Tiffin Club; JUM has been working mobile from Harrisburg, Penna.; and TSE has gone mobile. Northeastern Ohio's *Ham Flashes* tells us that WHF, WJP, and WNR are Novices at Greenford School; CYN, of Garrettsville, recently passed away; CMS has made WAS on 6 meters; JW is the 75-meter 'phone DX man in the area; and ZFZ is Nile's standout DX man on 15 meters. The Ohio 'Phone Net meets at 5:00 P.M. EST, Mon. through Fri. on 3860 kc. HPP is NCS. The Ohio Council of Amateur Radio Clubs wants all clubs in the State, affiliated or not, on its mailing list. Send club name, officers' names, date of annual election and meeting night dates to HNP, council chairman. Traffic: (Apr.) W8FYQ 461, DAE 250, UPB 190, MVJ 151, ARO 98, IIR 78, AMH 56, MQQ 54, IFX 51, HNP 50, AJW 46, ZAU 44, RO 42, IJH 37, LZE 34, HPP 24, AJH 20, QXH 18, TLW 12, LMB 11, GZ 8, HUX 8, ET 7, MGC 6, QIE 5, BF 4, EQN 4, HFE 4, LGR 4, ABO 3, BLS 3, VTF 3, AYR 2, CRA 2, DG 2, MEI 2, KXN 1, VUS 1. (Mar.) W8MVJ 81, WAV 22, PBX 7, QXH 7, DL 1.

## HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2JLI — SEC, RTE, RMs: K2BJS and W2TYC. PAMs: GDD and IJG. The E.N.Y. Council of Radio Clubs is now in full operation. The first official meeting was held at the Nelson House in Pok on Apr. 16th and the following officers were elected: ILL, pres.; GTC, vice-pres.; K2DRV, treas.; and EFU, secy. Delegates from 60 per cent of the E.N.Y. clubs attended as well as many guests, including Director Cooke, OBU. Plans are under way which will be of much benefit to all of our member clubs. All interested clubs should write the Council secy. for information. EC WWK has recovered from a recent illness and reports that the Schenectady Co. AREC Net meets every Sun. at 1400 on 3950 kc. Section Net certificates were awarded to K2s DKM, DXP, BBJ, GOB, and EKE for activity on NY-SEPTN. K2EDH has a new beam on 14 Mc. plus a new wire for 3.5 Mc. Jon is an ORS and is very active. K2HVN is active on NYS (3925 kc.) and the Tuckahoe C.D. Congratulations to AARA on the publication of *B Plus*. The bulletin contains much useful information and news. K2BNI is the editor. Club officers are ONE, pres.; GPC, vice-pres.; KN2HQI, secy.; and K2CT, treas. RTE and ILL each received a citation awarded by the Edison Committee for activity during the hurricanes of last year. New officers of the HHRL are AAD, pres.; K2DRN, secy.; K2AYZ, treas.; and OIT, act. mgr. MHE is a proud papa for the fifth time. It's a girl. A good club member pays his dues and thus supports his club. Let's all keep our clubs alive and be good club members. New officers of the RVWARS are EYG, pres.; KJL, vice-pres.; BEC, secy.-treas. The Club is planning many interesting activities. Traffic: K2EDH 120, EHI 33, W2LRW 26, K2EKE 22, HJX 20, W2EFU 16, K2HVN 15, EUU 11, W2ANB 5, K2BE 2.

NEW YORK CITY AND LONG ISLAND — SCM, Carleton L. Coleman, W2YBT — Asst. SCM, Harry J. Dannels, 2TUK, SEC: ZAI. PAM: NJL. RMs: VNJ and LPJ. The new PAM replacing JZX is NJL. Vi had to relinquish the PAM post because she and the OM, JDG, are moving to New York City. VNJ is anxiously looking for business on NLT (3710 kc.), the section slow-speed training net. LPJ could use an NCS on 2RN for the Mon. and Thurs. late sessions. Most AREC and RACES nets were active for the April 30th drill. DSC, with operators JOA and K2s BJS and EOF, relayed from NYC 'phone nets to NYS c.w. nets with simultaneously-operated rigs. K2DDU is sporting a new NC-183. K2ECN's new 300-watter is doing a fine job. K2HYK has new Viking II and VFO. VDT built a new antenna tuner for his B&W 5100. LGK's jr. operator passed the Novice exam and is awaiting his call. IVS completed his "Ultimate" key. PF reports that the Radio Club of Brooklyn, founded in 1919, is the oldest amateur radio club in New York. Officers of the Club are PF, pres.; CCD, vice-pres.; BKP, secy.; AAZ, treas. AOD uses AX9903 finals on 144 and 435 Mc. MDM now has a 40-meter ground plane. K2GWW finished the new transmitter using a pair of 1625s. GXC has joined the 2-meter ranks. Ditto AEE for the first time in its 41-year history. LG, one of the Tu-Boro Club's charter members, now is on 10 meters. AZY is the latest addition to the Tu-Boro caravan. K2AED has completed a 2-meter converter. '55 officers of the Mid-Island RC are JBQ, pres.; KTF, vice-pres.; STG, secy.; and AZT, treas. K2KKZ dropped the "N." Ex-K2GSZ now is KP4ACI and is looking for NYC-LI friends on 10-, 15-, and sometimes 20-meter 'phone with his Ranger and 220-ft. Vee. KN2LDL has the rig set up in his office. WCR, the V.H.F.

(Continued on page 88)

# Introducing...

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- **Longer Life**



ACTUAL SIZE

**4X250B**, a new, superior radial-beam power tetrode by Eimac — originators of the famous 4X150A—is now available. Unilaterally interchangeable with the 4X150A in practically all applications, this amazing new bantam for modulator, oscillator and amplifier application from low frequencies into UHF, offers these advantages:

**HIGHER POWER**—Electrical advances permit an increased plate dissipation rating of 250 watts, plate voltages to 2000 volts and doubled plate power input capabilities of 500 watts.

**EASIER COOLING**—Development of the Eimac integral-finned anode makes cooling so easy that only one-third the air-pressure and one-half the cubic feet of air are required. Forced air is unnecessary during standby periods.

**LONGER LIFE**—A newly designed, highly efficient oxide cathode and increased temperature tolerances, coupled with Eimac-developed production and testing techniques enable the 4X250B to meet the most critical standards. New tech-

niques in grid production, high vacuum outgassing and product evaluation are among the features that insure uniform incomparable quality and more hours of top performance.

The small, rugged, versatile 4X250B is now available for existing sockets or sockets of yet-to-be-designed equipment demanding optimum quality and performance.

### TYPICAL OPERATION

(per tube, frequencies to 175mc)

#### 4X250B radial-beam power tetrode

	Class C CW FM Phone	Class C AM Phone	Class AB RF Linear
D-C Plate Voltage	2000v	1500v	2000v
D-C Screen Voltage	250v	250v	350v
D-C Grid Voltage	-90v	-100v	-60v
Zero Sig D-C Plate Current	—	—	50ma
D-C Plate Current	250ma	200ma	250ma*
D-C Screen Current	12ma	10ma	5ma*
D-C Grid Current	22ma	23ma	0ma*
Peak RF Grid Voltage	114v	125v	60v*
Driving Power	2.5w	2.9w	—
Plate Power Input	500w	300w	500w*
Plate Power Output	400w	240w	325w*

\*Maximum Signal

For further details contact  
our Technical Services  
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# ANNOUNCING!

## NEW LOW PRICES

For Most Models

### Mosley "VEST-POCKET" Rotary Beam Antennas

Here's happy news for Hams! NOW — just in time for the 'Beam Raising Season' — MOSLEY is glad to announce an appreciable reduction in Amateur net prices for most models of the popular "Vest Pocket" Rotary Beam Antennas!

MODEL VPA1015-2	2 El. 10, 11 or 15 Meter Beam. (formerly \$49.95)	NOW \$39.89
MODEL VPA1015-3	3 El. 10, 11 or 15 Meter Beam. (formerly \$69.95)	NOW \$59.68
MODEL VPA20-2	2 El. 20 Meter Beam. (formerly \$55.95)	NOW \$44.73
MODEL VPA20-3	3 El. 20 Meter Beam. (formerly \$79.95)	NOW \$66.37

Increased sales volume, permitting more advantageous raw material purchases and the use of more efficient production methods, make possible these new low prices. The practical, rugged designs and careful workmanship have won world-wide recognition for MOSLEY "V-P" Rotary Beam Antennas. These qualities — despite reduced prices — will be constantly improved!

Ask your favorite Ham Equipment Supplier or write direct for Free copy of MOSLEY Catalog H-55.

**Mosley**  
Electronics, Inc.  
8622 ST. CHARLES ROCK ROAD  
ST. LOUIS 14, MISSOURI

Institute station, soon will be heard on 220 Mc. K2GHS is spending a lot of time with the new HQ-140X. The Five Towns RC has elected the following officers: BFN, pres.; K2EWB, vice-pres.; K2CFF, secy.; and KRP, treas. KN2KRJ is working for WAS award. Another "ham" family is OM K2HZC. XYL KN2LUS, and jr. operator KN2LUR. K2JNE dropped the "N." RZB is back on 20 meters again. The Levittown RC has a new Communicator and an HQ-129X. JVO demonstrated his s.s.b. to the North Shore RC with a KH-6-Land contact. LR soon will be heard as DL4LR. New members of the NYRC are K2s HVM and JVB and KN2LYV. A new call at HJ is KN2LYC. GG added 4-400-A linear on 20-meter s.s.b. WFL has a new Viking Ranger. The Chaminade HS RC boasts more than 50 members. The Fieldston School Radio-Electronics Club uses an AT-1 and a BC-348N. The Humdinger Net, a training net, meets on 7220 kc. at noon with PEQ as NCS. 1RTV/2 now is K2MQV. YHP added 4 new states in the recent 2-meter opening. DBI is leaving for overseas. Traffic: (Apr.) W2LPJ 594, AEE 386, VNJ 331, JOA 280, MUM 110, OME 69, K2CRH 47, ABW 41, W2DSC 38, GPQ 34, K2HYK 30, W2GXC 23, VDT 20, K2GHS 18, W2LGK 18, K2AMP 14, DDU 13, W2IN 6, IVS 5, PF 5, TUK 4, K2CMV 3, W2EC 3. (Mar.) W2GXC 86, AEE 16, LGK 14, HJ 8, AZS 7, K2BAH 5, HYK 4, DVT 3, AED 1. (Feb.) W2MZX 4.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: IIN. PAM: CCS. RMs: NKD, CGG, and EAS. K2EUN is off the air because of antenna trouble. CXW completed his 740th QSO with G6BY. He has been keeping skeds with G6BY since November, 1950. K2EUN is leaving the section soon and will next be heard from W5-Land. KN2IVZ had his shack attacked by squirrels. Result one speaker cone and one output transformer are no longer with him. CCS needs more New Jersey 75-meter 'phone stations in TCPN, 3970 kc. daily from 1900 to 2000 hours EDST. How about some of you fellows lending a hand? It will be sincerely appreciated. VYB is out of the Navy and on the air again. CFB is busy lending a hand to prospective new hams. Harry asks that anyone in his area, which includes towns adjacent to Toms River as well, who is interested in getting started in amateur radio see him at any time for instruction. CVW soon will have a new QTH in Sayerville. KN2IVJ and KN2EVJ passed their General Class exams. WFK is about to move to Boston. The Irvington Radio Amateur Club Auxiliary reports great progress since its organization a few short months ago. All YLs and XYLs in the Irvington Area are invited to attend meetings. If interested, contact Debbie Klarfeld at Hillside, Tel. WA 6-4642. QLF has a brand-new XYL. Mr. & Mrs. have established their residence in Jersey City. Northern New Jersey Novices active on 80 meters are KN2s LRF, KJT, LSX, JIA, and JXL. KN2KHZ is quite the DX man and keeps the Globe Scout real busy these days. ZPD again is congratulated on his endless hours of work in the RACES program in Bloomfield. K2DHE temporarily is QRL. It looks now like the wedding bells will ring for him very soon. NIE is getting the antennas in his back yard all fixed up after a long winter's work. GUM and his new Ranger sound great on the air. It's good to have him back with us. K2ICE is going great on 144 Mc. with his two towers and his horizontal and vertical arrays. Traffic: (Apr.) W2EAS 234, CQB 196, K2EUN 127, GFX 84, DSW 74, W2FPM 47, K2BWQ 40, KN2IVZ 33, K2EQP 30, W2CXW 25, CCS 24, HXP 15, CFB 6, VYV 5, CJX 4, NIY 3, CVW 1. (Mar.) K2EUN 74.

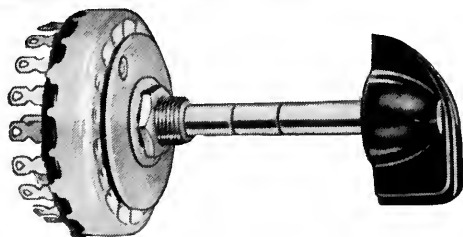
### MIDWEST DIVISION

IOWA — SCM, William G. Davis, W0PP — By the time this report appears BDR will be your new SCM. Please give him the cooperation you have always given me. The officers of the Iowa 75 'Phone Net for the next year are BSG as NCS; DWD, KJH, ERP, and TTT as alternates; TTT, BDR, FLN, DWD, ERP, and FMX as directors. Officers of the newly-formed and incorporated Fairfield High School Amateur Radio Club are UEG, pres.; LPW, vice-pres.; WDC, secy.; and CPC, treas. and act. mgr. Two KNØ licenses and W0WDC have been acquired since the club was formed in January this year. WDC is a YL operator and very active. W0ZSI, a newcomer to Iowa, reports for the Davenport gang. The club station, 0BXE, is going strong on 75 meters since the weather has warmed up. HMM's classes still are going strong. CGY received a QSL saying he had the best fist on the air. He's only been at it 30 years. The number of mobiles in Cedar Rapids is astounding. BDR and SCA took the entire output of messages from K5USA over Easter, a total of 531, and made BPL in 48 hours. PKX has his Ranger debugged. LJW says the HQ was worth waiting for. LJW and his band are on WOC-TV every Mon. at 9:30 P.M. SEF has a new Viking Adventurer. KN0AAH has a new Globe Scout. New on TLCN: 8GXM/0. KVJ reports he was heard by QVA, 140 miles, with his antenna grounded. PAN handled communications for Boy Scout simulated emergency. SQE made the highest scoring Novice award in Iowa. Traffic: (Apr.) W0SCA 1801, BDR 1704, PZO 597, CZ 192, QVA 112, KJV 106, LJW 76, BLH 32, PAN 27, SQE 20, LFZ/0 16, NGS 7, FDM 6, HWU 4. (Mar.) W0PZO 464.

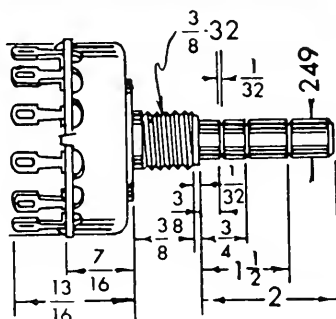
(Continued on page 90)



# MALLORY HAM BULLETIN



*To solve switch problems around the ham shack . . . in portable test equipment . . . in Civilian Defense gear . . .*



## USE MALLORY SERIES 3100-3200 ROTARY SELECTOR SWITCHES

It is probable that most amateurs are familiar with the operation of Mallory 3100-3200 series rotary selector switches when used in antenna changeover circuits of the type commonly employed in converters, signal boosters, and RF pre-amplifiers. However, it is doubtful that very many amateurs are fully aware of the extent to which these compact switches can be used around the ham shack to solve other switching problems.

In many respects, the Mallory 3100-3200 series switches offer more genuinely useful features to the amateur designer than any other switch, or family of switches, made. They are small and compact, which means they can be extremely useful in portable test equipment or Civilian Defense gear. Their axially positioned solder lugs reduce the over-all panel space required for mounting, and at the same time permit more convenient wiring.

In spite of their small size, the Mallory 3100-3200 switches do not sacrifice efficiency or reliability of operation. Each terminal-contact is fabricated from a single piece of metal to reduce circuit loss and the possibility of intermittents. At 6 volts DC, these contacts will carry 10 amperes of current without excessive heating. At 250 volts DC, 50 milliamperes may be made and broken continuously without harm to the switch. Triple X grade phenolic insulation, used throughout, assures excellent high frequency operating characteristics for coil and crystal switching in either transmitters or receivers.

The unique Mallory 3100-3200 switch design has been field-tested thousands of times as an important component in expensive commercial test equipment. Research laboratories use it daily as a part of precision measuring devices. And it is recommended consistently time after time in published plans detailing the construction of ordinary and highly specialized electronic apparatus.

Yet, the same switch is available to you from your regular Mallory Distributor at no extra cost.

For your information, the Mallory 3100-3200 switch is made in 12 circuit combinations, in either shorting or non-shorting styles. Switches of 12 positions or less (30° indexing) are 1 1/4" in diameter; all others are 1 1/16" in diameter, have up to 17 positions depending upon the number of circuits, and feature an adjustable stop mechanism. Bushings are standard 3/8" in diameter and have a #32 thread. Shafts are 1/4" x 2", and are pre-grooved at popular lengths to permit accurate cutting. An attractive molded knob is supplied with every switch.

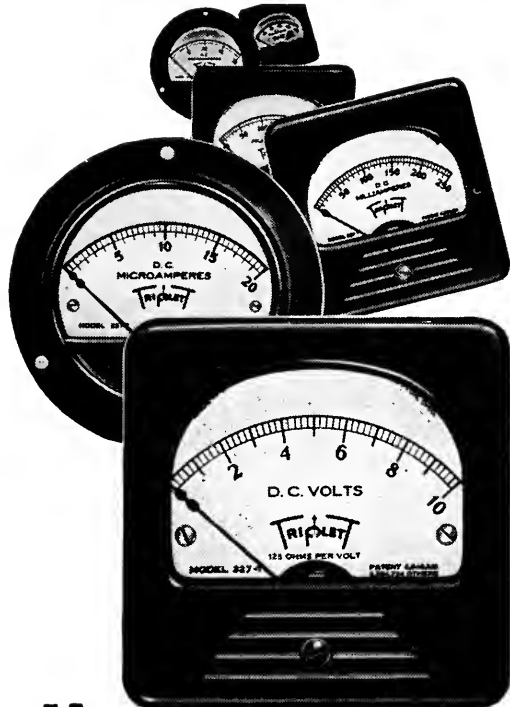
Why not visit your Mallory Distributor today, and see these useful switches first hand? And while there, don't forget the other dependable Mallory parts you may need . . . controls, rheostats, potentiometers, pads, tubular capacitors, transmitting capacitors, dry electrolytics, disc rectifiers, vibrators, vibrator power supplies, and enamelled resistors.

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# Triplet

TRIPLET ELECTRICAL INSTRUMENT COMPANY · BLUFFTON, OHIO, U.S.A.

KANSAS — SCM, Earl N. Johnston, W3ICV — SEC: PAH, RM: KKL/NYI, PAM: FNS. Hope to see you at some of the picnics this summer. The CKRC held its first Annual Award Banquet May 1st, giving out five awards. PSL took top honors as c.w. man, DUG as the outstanding 'phone man, MVG took the honors for v.h.f., the achievement award went to W0YGF, and the special merit award to JAS. The KVRC has held several surplus equipment auctions to raise expense money for Field Day. The Wheat Belt Radio Club has extensive plans for Field Day. The QTH, 11 miles north of Herndon, looks very promising. UOL is installing a Morrow converter and a Lyco in his car. ZCG and RGB are building 813 rigs with pi-network and adequate shielding for TVI. KN3ATA and KN3ATB, father and son, are new stations in Eldorado. KN3ADV also is a new station in Eldorado. News items are slim this month, but look at the traffic reports! Thanks, fellows, and would appreciate it if you would remind those you know handling traffic to report it. Traffic: (Apr.) W3BLI 677, N1Y 427, K0FDD 255, W0UAT 178, FEO 114, MXG 90, EOT 69, FNS 63, SQX 52, ABJ 48, ECD 48, FDJ 44, ICV 31, LOW 27, REP 26, LBJ 25, SAF 21, RKO 20, YXB 20, TNA 19, VFC 17, YJU 16, ECD 15, QGG 15, WNYVM 14, W3KAJ 13, YFE 11, UAU 10, DEL 8, LIX 8, WWR 8, LYF 7, W0WSEZ 7, KN3AHW 6, W0LQX 5, SVE 5, K0NAB 4, W0RJL 4, ZYL 3, W0CET/0 2, RKM 2, TTX 2, WNV 2, CLK 1. (Mar.) W0SYZ 6, UOL 3.

MISSOURI — SCM, James W. Hoover, W3GEP — SEC: VRF, PAM: BVL, RMs: OUD and QXO. The Show Me Net operates on 3580 kc. at 1600 on Sun. BUL, MFB, and ORF, net control stations for the Missouri Emergency Net, have received OPS appointments. K0AXY will be operating from his bed at St. Joseph's Hill Infirmary, Eureka, Mo. SUV has been elected chairman of the Transcontinental 'Phone Net for districts 9 and 0. CPI and SUV are the net control stations for these districts. RTR has been appointed EC for Rolla. The Suburban Radio Club, St. Louis, has received incorporation papers and has finished a new kilowatt transmitter. HJO is using a new electronic key. ECE has a new S-85 receiver. GCL is the Communications Officer of CAP at Rolla. RTW has a new 50-kc. frequency standard. OMP is going to Anchorage, Alaska, and his mother, OMM, will be operating on 20 meters more often. RUK is working on a new 100-watt transmitter. IJS is teaching a Novice code and theory class for a Boy Scout Troop. The St. Louis University Radio Club is getting a new 32V-3 transmitter. Traffic: (Apr.) W0CPI 1074, GAR 414, K3FBO 354, W0GBJ 352, BVL 194, CKQ 134, OMM 114, VTF 73, SAK 64, RTW 57, OUD 43, KIK 41, IIR 34, RUK 32, RCV 31, HUI 26, WAP 26, IJS 19, EBE 17, RTO 17, BUL 10, GEP 8, MFB 4, TCF 3, QMF 2. (Mar.) W0IJS 62, ECE 12, HJO 5. (Feb.) W3IJS 72.

NEBRASKA — SCM, Floyd B. Campbell, W0CBH — Asst. SCM: Tom Boydston, 0VYX, SEC: JDJ. The North Central Nebraska Amateurs recently organized the Elkhorn Valley Radio Club with RAM, pres.; PDH, treas.; RMO, secy. A new call at North Platte is UH with ex-EXP at the mike. LRK and KXD built a nice-looking (and working) 'scope. RHL still is plugging away on his Nebraska homebrewed kly. The Omaha boys were on the ball recently when a call came to provide communications for the practice evacuation of Omaha and vicinity. RNH has closed down for the summer. AIN built a VT keyer and Q multiplier. The Sidney and Potter boys recently received a nice write-up with a picture in the *Sidney Telegraph*. They were the only means of communication during a snow storm. The Wheat Belt Radio Club consists of members from Kansas and Nebraska. We sure need an EC from that part of Nebraska. Any takers? Employees of Union Pacific, don't forget to contact WR for your membership in the Union Pacific Radio Club. The North Platte Club has changed from Mon. to Tue. at 7:30 P.M. on 3950 kc. Traffic: W0ZJF 259, DDT 128, HTA 57, LJO 51, ETQ 45, KDW 41, RNH 40, AEM 39, FXH 32, MAO 23, VYX 23, ERM 22, ORW 22, DJU 20, PUT 19, KVM 13, FRs 12, FMW 11, NIK 10, ECQ 9, VGH 9, CHH 7, CBH 6, K0FBD 6, W0KFZ 6, OOX 6, BEA 5, AGP 4, IRW 4, RAM 4, THX 4, ZNI 4, BOQ 3, IAY 3, SZL 3, VRE 3, AIN 2, HQE 2, POL 2, UJI 2, PZH 1.

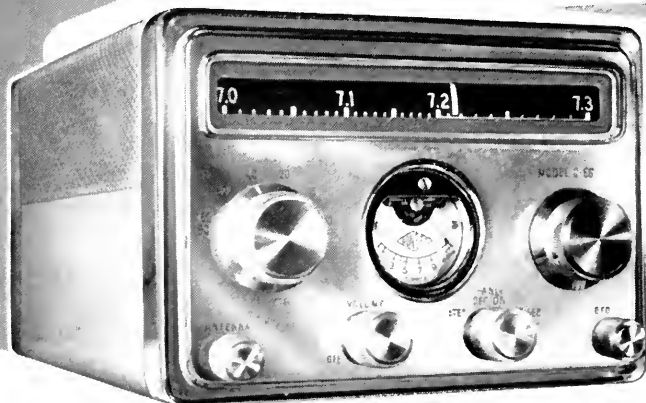
## NEW ENGLAND DIVISION

CONNECTICUT — SCM, Milton E. Chaffee, W1EFW — SEC: LKF, PAM: LWW, RM: KYQ, MCN and CN 3640 (0645 and 1845), CPN 3880 (1830), CTN 3640 (Sun. 0900), CTN 29,580 kc. The traffic total on CN hit a spring peak, with 249 in 26 sessions. KYQ and RGB were QNI 23 times, LIG 22, and YNC 20. On the early session, MCN fell back to 115 in 23 sessions, being plagued with rough conditions. YYM, RGB, and IBE took QNI honors. CTN reports reduced attendance. Aren't there any who want practice or is it an inconvenient time? We are interested in your comment. CKA, CLD, and ZFK report new General Class tickets. RAN is doing his stint for Uncle but managed activity during time off plus a new 6146 three-band portable job. YBH again is high on the traffic list — all on 'phone. BVB has forsaken 80 for 40 meters, where he finds QSOs more plentiful. TYQ is a regular on CN and MCN between flights to HZ-Land. WX reports much activity in the

(Continued on page 92)

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## MOBILE RECEIVER

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- (4) 14,000-14,350 KCS . . . . .
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- (6) 28,000-29,700 KCS . . . . .

Individually calibrated amateur bands are spread across entire dial.

DOUBLE CONVERSION; 2050 KC 1st I.F. for high image rejection. 265 KC 2nd I.F. with 8 high Q tuned circuits. Provides sharp "skirt" selectivity. (3.5 KC at 6 db down.)

BEAT FREQUENCY OSCILLATOR: BFO with VR and panel adjustable pitch control. Highly stable for C.W. or SSB reception.

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3 WATTS OF HIGH QUALITY OUTPUT AUDIO .

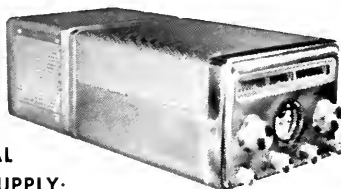
PHONE JACK . . . . .

TUBES: Eight tubes, plus OB-2 voltage regulator.

MECHANICAL: Front panel and chassis slip readily in and out of outer housing which may remain permanently mounted.

DIMENSIONS: 4 1/2" high, 6 1/2" wide, 9" deep. Power supply adds 4 3/4" to depth.

All the skill and experience of a firm universally recognized for their long-term leadership in the mobile field, have gone into this excellent new receiver. Here . . . finally, is a complete mobile receiver that squarely meets every mobile requirement . . . phone, C.W., SSB . . . without compromise . . . without detours. Excellent communication receiver performance is inherent . . . in mobile with both 6 and 12 volt systems . . . in home station operation with 115V AC.



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6V DC . . 12V DC . . 115V AC

Matches receiver case, attaches and plugs into back of receiver as a cabinet extension. May also be separately mounted. Change from D.C. to A.C. made merely by using proper plugs which are supplied.

\* BUILT-IN SPEAKER: Terminals provided for external speaker, also for receiver muting.

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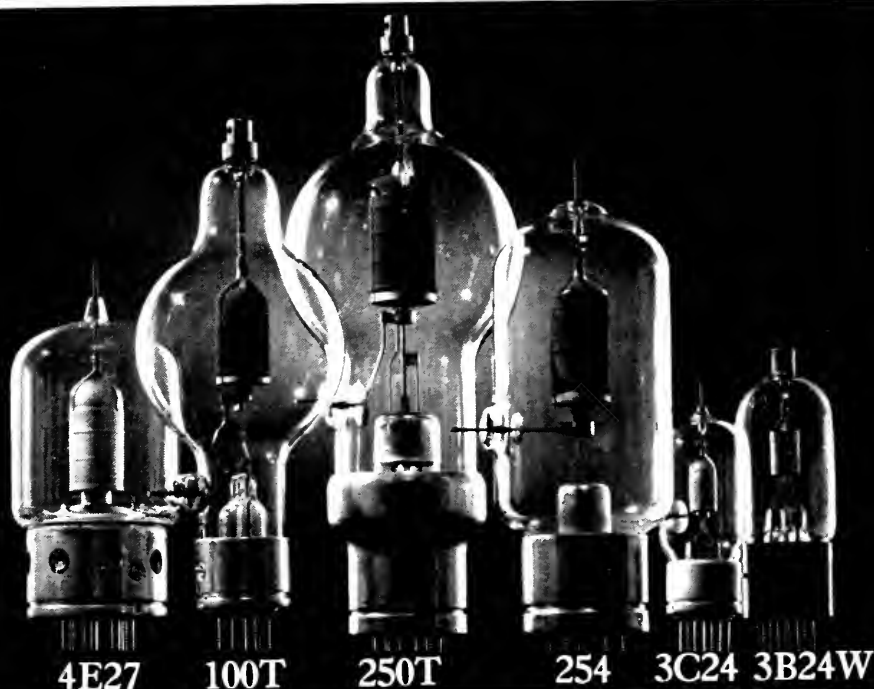
Fairfield Area. New ORSs include UED and RRE. Other new appointments include DVO and ULY as ECs, while OPZ and RMT renewed EC appointments. EGS and EGN are new Novices in the Middletown Area, while Novice ELQ joined the ranks in Southington. EDH is the call of the Middlesex RA. RDV has moved to Windsor Locks. Several clubs report plans for Field Day so we can expect to see their scores mount up. NFG reports on Hamden c.d. and the need for further inspiration to maintain interest. DX was the speaker at the Apr. 21st meeting of the HCARA. Operators at TIJ for the Apr. 30th C.D. Test included STT, RGB, WHH, and PHP. Amateurs in south-east Connecticut soon will be mailing out novel QSL cards which picture the vacation attractions of their area. Any operator in the area will be able to obtain a supply of these cards from the Public Relations Department, Electric Boat Division, General Dynamics Corporation, Groton, Conn., by writing and asking for them. More news from the gang would be appreciated. Club secretaries, any news from your group? Nice bulletins are received from the MRA. How about others? Traffic: WICUJ 203, YBH 195, AW 176, KYQ 163, LIG 119, RB 98, LV 87, EFW 81, YYM 68, UED 67, RRE 64, BDI 53, ZDX 38, TYQ 26, HYP 24, BYB 18, RFJ 16, YNC 16, AYC 12, KV 12, RAN/2 11, CJD 10.

**MAINE**—The section's operators were saddened by the death of the SCM in April. The Sea Gull Net observed a period of silence on 3960 kc. during the funeral services. Activities reports are presented as compiled by the SEC. TVB, while an SCM election is in progress. LHA and BPI/VYA were nominated as SCM candidates. Nets: The Pine Tree Net meets Mon., Wed., and Fri. on 3596 kc. at 7 p.m. Barnyard Net Mon. through Sat. on 3960 kc. at 8 a.m.; State of Maine Phone Net Mon. through Sat. on 3940 kc. at 5 p.m.; the Maine c.d. drill Sun. on 3993 kc. at 11 a.m. and 3503.5 kc. at 9 a.m. BDF and BBS, Myron and Kay Hilton of Freeport, are on with new rig. Wel-come to two new Novices in Portland, Maynard Gray and his XYL. Good luck to the new Teen-age Forest Net, which meets Sat. and Sun. on 3900 kc. at 10 a.m. Teen-agers in the first call area are welcome. The State of Maine Phone Net is well supported. All will look for the Sea Gull Net when standard time rolls around again. VZI and her OM are planning a trip to Kokadjo for the season and taking along the emergency rig. SNE, AMR, and RSC are back from warmer climes. VWT, of Gray, is back home from overseas with a new rig on the way. Two meters is gaining headway in the State because of c.d. The many stations on 2 meters include DEO, AMR, ACO, BPI, LHA, GUV, LBJ, and ZBN. Maine lost two fine operators when Jim, YGO, and Hope, YGP, moved to W3-Land. PS now is on top of Mt. Washington in the WX service. We miss him on 29.5 Mc. We're indebted to PAM Happy Hamlin, WRZ, for a consolidated report on Sea Gull Net operation. From Sept. 27th to Apr. 22nd an average of 51 stations called in per night for 148 nights—223 different stations called in; 14 NCS with traffic total 593 messages. The highest number of call-ins was 80. Traffic: WIWVG 205, ZME 105, LKP 78, NXX 60, UDD 54, BX 37, LYR 32, ZMK 18, OTQ 13, ZUL 13, SQV 12, TWR 9, TKE 6, BDF 5, DNV 5.

**EASTERN MASSACHUSETTS**—SCM, Frank L. Baker, jr., WIALP—New appointments: BEI Medfield, WK Quincy, and WNP Concord as ECs; VYI and UKO as OPS. Appointments endorsed: WAG Taunton, AWO Wenham, FEC Middleboro, QGJ Woburn, YHY Fall River, AWA No. Reading, BWH Attleboro, LLY Arlington, ICU Amesbury, JSM Waltham, and VVZ E. Bridgewater as ECs; PXH and JSM as OES; QGJ, DJ and SS as OPS; PYM and SS as ORSs; TVZ and AYG as OOs; SCS and AWA as OBSs; AWA as PAM for the 6-meter band. New officers of the South Shore Radio Club are AJU, pres.; QMJ and QOI, vice-pres.; MME, secy.; TZQ, treas. Heard on 2 meters: QF mobile, RMF, EGY, DYQ, EMY, NAR, ZVS, and EPL. YVL is mobile on 10 meters. On 75 meters: ACC, SNZ, NWS, and LSA. ALP visited the Scituate Club. EQU is SNZ's boy. JLQ flew out to California on a trip. ALP and CTR visited the Framingham Club. Radio Amateur Open House had SX give a talk on s.s.b. Officers of the Nashoba Radio Club are WNP, pres.; TRD and ZML, vice-pres.; CAN, secy. WXC is getting out well on 10 meters. DWO is making an s.s.s.c. exciter. RCA and DJA are on 2 meters. New officers of the Braintree Radio Club are UIR, pres.; ZSU, vice-pres.; CTR, secy., treas. The Wellesley Radio Club had an auction. DUO, LOS, CLF, BW, KBS, AYG, ALP, CTR, EKG, and KWD were active in the April 30 RACES drill for Sector 1B. AMV and KXP have a sked with 0CQY. New hams in Easton: WNIs EGF, EGG, and DMQ. AAI and ZSR have General Class licenses. BB had 20 fixed, 1 mobile, and 7 mobiles ready in the Apr. 30th drill. CTR will be mobile soon. VYI operated as Region 1 FCDA on 75 meters in the Apr. 30th drill. WU has a new rig with 813s for 20 meters. The Cape Cod & Island Net has a new certificate designed by TWN/BLM. New Novices: EOJ, EQM, EPF, EVF. Tech. Class: EOZ. General Class: AEG, DLF, and DFY. New officers of the Norfolk County Radio Assn. are GDY, pres.; HTR, vice-pres.; ALK, secy.; CQN, treas. IIP is a new member. IXI is working on the house. WTF will have a new tower on the house. ALK is on 80 meters with 200 watts. WHC is

(Continued on page 94)

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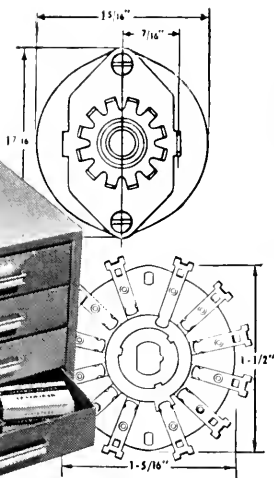
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on 75 meters. A new club in Waltham is the Middlesex Amateur Radio Club. Officers are SAD, pres.; DYK, vice-pres.; AEG, secy.; ZPY, treas.; BTX/DED, chief eng.; DWH, act. mgr. The South Eastern Amateur RA will move into new quarters. Fifteen New Bedford hams have received an Edison Radio Amateur Award. AZU has a Match Box for his antenna farm. New Bedford's RACES frequency is 29,610 kc. for mobiles. WKM took part in the Apr. 30th drill with CCA/1 as Sector Hq. station at Fall River. CTZ is Radio Officer and WGN Alternate. The Wellesley Amateur Radio Society held a meeting with a talk by GWD of Raytheon. BEI will be on the air soon. In a Sector 1-B test drill the following were on: TYN, WUV, VPR, ISU, MME, FWS, CLF, ALP, YYZ, LOS, HSN, KWD, VAN, DUO, SH, FWS, GNK, YFA, and DW. ALP has a Viking VFO for his rig. The Lexington 2-meter C.D. Net is on 147.1 Mc. Sun. at 9 P.M. The Cape Cod & Island Emergency Net did a nice job during the snow storm in April. Traffic: (Apr.) WUOK 388, EMG 239, VYI 227, EPE 109, AVY 73, IBE 62, UE 49, NUP 44, LM 43, CLF 35, TY 23, WU 13, BY 10, DUO/TYN 9, BB 5, AHP 3, ZDX 2, A1P 1, CTR 1. (Mar.) W1VY 225, WU 9.

**WESTERN MASSACHUSETTS** — SCM, Osborne R. McKeraghan, WHIRV — SEC: RRX, RM: BVR, PAM: QWJ. The WM C.W. Net meets on 3560 kc. Mon. through Sat. at 1900 EDST. The Wm Phone Net meets on 3870 kc. Wed. at 1800 EDST under the guidance of MNG. The Central Mass. Amateur Radio Assn. has trained 34 Novice operators this year, many of them now General Class. The HCRA's annual banquet at Toto's was a huge success with 84 members, friends, and visitors enjoying a fine time. New ORSs are ZUU, YCG, and AJX. WCC made BPL in March with origins from the Springfield Technical High Science Fair. Tech High has six hams: WEF, ZIO, AJX, AOT, AOU, and DMT. AJX received the WANE award. RRX, TVJ, and NN1 received Edison Hurricane citations. UVI made up the maps accompanying the WM C.W. Net bulletin. TAY is drawing up the RACES plan for Amherst. LIB, Webster, reports himself, AJV, CJW, ABW, QEA, AVW, and WN1BHC signed up and operating a c.d. net. LRA is the new Westfield C.D. Radio Officer. TVJ reports 19,200 points in the CD Contest with an average of one QSO every 3.86 minutes. AEW transferred from Pittsfield to Holyoke. SPF reports his regular bulletin transmissions are looked for by many in the Worcester Area. The new EC for Fitchburg is STR. SRM received a WAV certificate from Vasteras Sweden Amateur Radio Club. KL7BHG, Fairbanks, Alaska, ex-WITAB, writes he is working W1s regularly on 14-Mc. c.w. and looking for more contacts. YCG made BPL with origins and deliveries from Amherst College. JYH has a new antenna and a 4/125A final. WN1ZWZ passed the General Class exam and has a new rig. Traffic: (Apr.) W1UKR 384, YCG 187, BYR 163, TVJ 151, AJX 133, WEF 128, HRV 86, MNG 63, TAY 46, RRX 41, DVW 34, AMI 28, ABY 23, ZUU 20, UVI 17, JYH 7, LIB 3, HRC 1. (Mar.) W1TAY 38.

**NEW HAMPSHIRE** — SCM, Harold J. Preble, WHHS — SEC: BCX, RM: CRW, PAM: AXL, CNX is the proud daddy of a new jr. operator named Scott born Apr. 14th. AVJ has a new granddaughter. The 1st Region RACES test held Apr. 30th went smoothly in New Hampshire but needs coverage in Carroll and Coos Counties. The Manchester Radio Club soon will be on the air with a new rig using a 4-250A on all bands. WUU has a new QTH in Manchester and expects to be back in net operation soon. TP is trying out the new SX-99. General Merrill is sponsoring the N. H. Dept. of P.W. and H. Radio Club, which meets every Thurs. evening 7 to 9 for code practice. ARK made BPL in April. RZD has a new position with the U. S. Dept. of Education in Washington and we hope to hear him on the air as a W3 soon. Welcome to Novices DYK, DZZ, ECA, and EBA. TNE now is K2KWN. Concord amateurs had an FB set-up at the recent Hobby Show in the N.G. Armory and handled considerable traffic. CRW has been reappointed RM, ORS, and OPS. CO3H3 wants New Hampshire contacts on 40-meter c.w. 5 to 6 a.m. ZLICH needs a New Hampshire contact for WAS. He is on 7002 kc. around midnight EST. We need more items from the eastern part of the State. Traffic: (Apr.) W1ARR 514, COC 45, ID 31, HOU 16, CCE 15, HS 14, PFU 14, FZ 9. (Mar.) W1CE 21.

**RHODE ISLAND** — SCM, Walter B. Hanson, jr., W1KKR — Almost the whole section had something to do with the April 30th combined RACES and AREC drill, and there's no doubt about it, gang, little Rhody did a grand job. The BVARC is almost ready for Field Day with 6 meters. DDD now has 400 watts and a new NC-125. IHV, ZEZ, AUT, and DPA discussed "Amateur Radio in Emergencies" on the Kiwanis Forum broadcast from station WWON. The Providence College Club has received the call DKG. K2LYE has been operating there. TRX is heard regularly on the Newport County Emergency Net and the R. I. Phone Net. 4CVO/1 reports nine off-frequency reports during the DX Contest. TBY has announced the formation of a new club in Bristol with URA sparking the deal. Seventeen members attended the organizational meeting, and the Club plans to affiliate with ARRL. Bristol County includes the towns of Bristol, Warren, and Barrington. New MARS affiliates include ZXA and AUT.

(Continued on page 96)

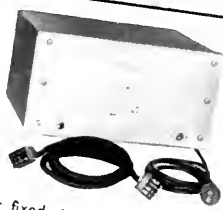
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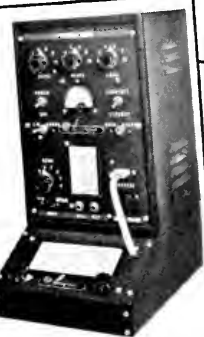


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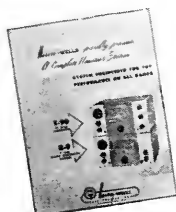
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ZXA boned for final exams with the prospect of an HQ-140X as a reward. VXC reports increased activity on the R. I. Intercity Net on 29.260 Mc. at 7:30 p.m. Traffic: W1BXN 116, BTW 98, VXC 85, UTA 80, TRX 62, TGD 52, ZXA 17, W4CVO/1 12, W1BIS 4.

VERMONT—SCM, Robert L. Scott, WIRNA—VTPN meets on 3860 kc. Sun. at 0930-1030 only; VTN on 3520 kc. week nights; GMN on 3860 kc. week days at 1200-1300 hours; Vt. c.d. nets Sun. at 1000 hours on 3993 and 3501.5 kc. ZWP, the Putney School Amateur Radio Club, Putney School, Putney, Vt., advises the Club has 12 members as follows: W1Ns DPE, DQN, DPD, DRY, DLE; W1s YAY and ARU; K2GRB. They operate mostly on week ends on 220 and 144 Mc., also 75- and 40-meter 'phone and c.w. Week-day operating is done at 0740-0820, 1320-1400, 1600-0820 (??), and 1900-2200. This is done between the dates of Sept. 10th and June 10th, the school year. The license plates seem to be bottled up in the committee to which it was first referred. Traffic: W1OAK 105, AVP 80, RNA 63, BJP 43, IT 39, VVP 27.

#### NORTHWESTERN DIVISION

ALASKA—SCM, Dave A. Fulton, KL7AGU—There seems to be an increase of mobile activity with the coming of longer days and the summer months. The Anchorage mobile gang hangs out on 3866 kc. and is planning a lot of interesting mobile activities for the summer months. AWB will be leaving soon for W5-Land; after working real hard on the Alaskan DX certificate Joe now is going to W-Land to try and earn one for himself. That is one for the book; work real hard to design a certificate and then move so you can qualify for it. DX seems to be improving in KL7-Land. Are we really over the worst of the sunspot cycle or is it our imagination? AMS is the proud owner of a new mobile receiver. ANG is back on the air mobile after a long silence. RE should be on soon sporting a new all-band vertical and a Globe King.

IDAHO—SCM, Alan K. Ross, W71WU—Shelley: ACD is on 50.1 and 50.4 Mc. with 500 watts and a four-element beam and needs only Montana and Utah for WAS on 6 meters. Caldwell: EYR reports most of his time is spent on 20 meters trying for DX. Gifford: VWS is busy working the gang with his Adventurer and had 106 QSOs for April. He is planning to go to college in Arkansas. Kellogg: RQG is plagued with power-line noise. At this writing he and FL, of Sand Point, are running the GEM Net. Emmett: TYG plans to teach school in Wilder this fall. Boise: BNU from Whitefish, Mont., trailer-parked in town for three weeks. NVO is active in the FARM Net and MARS-Army. New stations on the 145.44-Mc. net are WN7YUX, WN7YXK, and KHM. There are about 12 stations on this frequency around here now. More reports from you fellows would be appreciated. We don't know what you're doing if you don't tell us. Traffic: W7RQG 26, TYG 22, NVO 3, EYR 2.

MONTANA—SCM, Leslie E. Crouter, W7CT—MQI has been appointed Emergency Coordinator for the Billings Area. MQI's station is located in his store where he can monitor the net frequencies throughout the days and evenings, Mon. through Sat. UZN will be operating mobile from Silver Gate during the summer months. YHS is a new call on the air, operating both fixed and mobile rigs. YXQ, another new licensee, is an engineer at KBMY. Ted is busy winding chokes and power transformers for a kw. rig. VZN, who is purchasing agent for the American Chrome Mining Co. at Nye, also is a new licensee and operates mobile. OQI, the Billings Club, is reconditioning the Club's emergency generators and gear, anticipating more and better activity in the very near future. IWW is in the process of installing a new rig in the new Cadillac. The SEC, KUH, recently visited the Billings gang. MQI is delving into the mysteries of the galaxies with the aid of his recently-acquired telescope, a present from the XYL. KGJ, KGF, and YZQ have also been "star gazing" in Carl's back yard. Activities have not been too well reported. How about sending them in, fellows? Traffic: W7MQI 11.

OREGON—SCM, Edward F. Conyngham, W7ESJ—PQJ, in doing OO work, has noted many Novice stations on second and third harmonics, outside the bands. VJT reports that the McMinnville Amateur Radio Club set up a portable at a Rotary Club meeting to display message-handling during an emergency. The EC, SYB, described the operation, while THV and VTT handled some traffic. The operation was a success and did a good job of convincing the Rotarians of the value of amateur radio. APF still is able to make BPL, although battling TVI. PRA has the big rig down for repairs and is using the small 75-watter. THX put up a new bantam beam on 40 meters and his first call raised Ireland. As of May 1st the total League membership for Oregon was 614; attendance at the OARA Convention was over 700. Most of the League members were there. Northwestern Director CPY gave an interesting talk on League affairs. K6BJ gave a timely talk on tetraodes as Class B linears. Wes R. Schum gave a very interesting talk and practical demonstration of s.s.b. K1DR gave a talk and demonstration of vacuum-tube construction. Lt. Col. Schauers, sixth Army MARS director, gave an interesting talk on MARS. Lt. Paul McAfee covered electronics in

(Continued on page 98)

# QUALITY PRODUCTS

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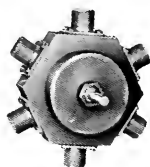
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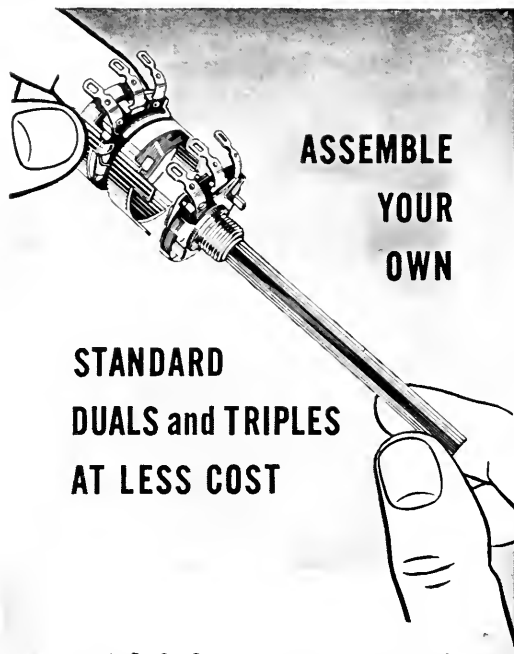
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the Navy today. 6AM illustrated his talk on DX stations in Europe with colored slides. The engineer in charge, FCC monitoring station, Portland, covered monitoring. We regret the loss of IIV, who died of a heart attack. Traffic: W7APF 586, ZFD 390, BLN 194, WLL 141, H1DN 66, BDU 50, WAT 50, OMO 31, BVH 25, NFZ 22, THX 22, PRA 17, LT 11.

**WASHINGTON** — SCM, Victor S. Gish, W7FIX — The Puysallup Club (IYU) reports: Mobiles JJK, QJC, MCU, HMQ, and portable MPH helped coordinate the annual daffodil festival parade as it passed through Puysallup; VLO is running a Novice Net; MCU is on RTTY on 2 meters. PVZ reports from Olympia: CMX is on RTTY on 2 meters; FWD and FWR were seen at the local radio dealers party looking very FB; the Capitol City Radio Club is going all out for Field Day. TWQ would like to hear from other high school radio clubs and exchange papers from the Marysville High Club. BA reports all rumors about getting a kw. are false — band conditions on 20 meters are much improved in the evenings. QYN is on with an 813. AIB has a new inverted L antenna 125 feet long on a Ranger. LYB complains of power line noise during rains and blows. Contact their interference man, Roy. BMK is completing a 250-watt final. CWN is going mobile. UQY reports Richland Club activity in the WAS Contest, and YFO has a new electronic bug. UKI is planning portable gear for summer use — not much activity on 420 Mc. HDT reports: UJA still is fighting BCI; FN has mobile in the new car; PKR gave up trying to convert surplus gear and bought a Heathkit DX-100. OEB is remodeling the house and will be off the air all summer. KAA has moved to Eugene, Ore. DWG is busy with traffic on 40-meter c.w., and is lining up the AREC activity in Kitsap County. RCM, our SEC, has been doing a fine job of lining up new ECs and getting reports. Several EC appointments have been canceled and new ones have been appointed to fill the vacancies. The section is showing promise of much better AREC activity in the coming months. Traffic: (Apr.) W7BA 1516, PGY 1246, K7FAE 598, W7FRU 561, VAZ 406, USO 132, RCM 96, HKA 81, OE 83, UIN 66, APS 62, RXH 56, FIX 45, UYL 45, EHH 40, QYN 24, FXA 17, AHV 16, AIB 14, EYF 10, LYB 9, TGO 9, K6BDF/7.8, W7AMC 8, EVW 6, GAT 6, BMK 3, CLZ 3, JEY 3, UZB 3, AHQ 2. (Mar.) W7OEB 41, GAT 14, ETO 10, ZU 5.

### PACIFIC DIVISION

**HAWAII** — SCM, Samuel H. Lewbel, KH6AED — This was a busy month for your SCM. Our RACES application was approved by the FCC. AFQ is now the Deputy Radio Officer for the Hawaii County C.D., ABF for Maui County, and ABI for the Oahu C.D. The Kauai appointment still is to be made. In each case your SCM is appointing those who are ECs. The following appointments are being made: BHH, EC for the Windward Oahu Club; KC, EC for the Honolulu Mobile Club; and ANR, EC for the Leeward Oahu Amateur Radio Club. AUJ is now an OBS. She transmits Official Bulletins on 7150 kc. Mon., Wed., and Fri. at 1700Z. The license plate bill passed both houses of the legislature and was signed May 5th by Acting Governor Turner. Get in touch with your local civil defense office for application blanks. Traffic: KH6AJE 2299, KA2MA 904.

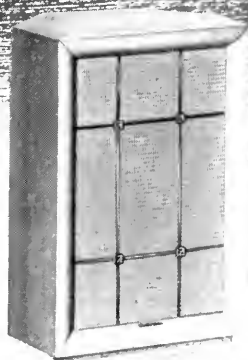
**NEVADA** — SCM, Ray T. Warner, W7JU — SEC: WVO, ECs: PEW, PRM, TVE, TJY, and ZT. OPSs: JUO and UPS. ORSs: MIV, PEW, and VIU. OBS: BVZ. Nevada State Frequencies: Phone - 3880 and 7268 kc.; c.w., 3660 and 7110. UPS will be operating portable for the next few months at Wendover, on the Utah-Nevada state line. WN7ZKD is a new Novice in Elko. It looks like the 7th call area soon will blossom out with "K" call prefixes. The Southern Nevada Amateur Radio Club is furnishing mobiles for the Las Vegas "Heldorado" parade control. A booth has been provided in "Heldorado" Village where a ham station will be placed in operation. 1N3M, our National Emergency Coordinator, spent a restless week in Las Vegas awaiting the recent atomic blast which pulverized "Doom City." 9KJM now is ZHT in Las Vegas. ARRL appointees are reminded to send in monthly activity reports by the 1st of each month.

**SANTA CLARA VALLEY** — SCM, R. Paul Tibbs, W6WGO — Another correction in the listing of club officers for the NPEC as sent in by MMG: the vice-president should read KN6EWG. A new call in South San Francisco is KN6KOJ. Eddie is the son of QIE. ZXS is finishing a new heterodyne exciter. We have received *Dits and Daks*, the paper of the Camp Gordon Radio Club, Camp Gordon, Ga. The editor of the paper is none other than 6OIF. AIT is going higher power with a new final. Irv needs more power to do better in traffic nets. K6BBI's CD score for c.w. was 47,800. Dick's MARS call is AAF6BBD. EXX has a new 144-Mc. converter using 417 in cascade all set for Field Day and also will use 6 meters. K6BAM needs West Virginia and some W1 states for his WAS. NX's new 75A-4 sure cuts out QRM, according to Frank's story. Next comes a vertical all-band antenna, then watch the tree leaves get burned by r.f. around his QTH. FON is very busy keeping us informed about the latest on the license plate bill. ACN puts information out on several of the nets. In listen-

(Continued on page 100)

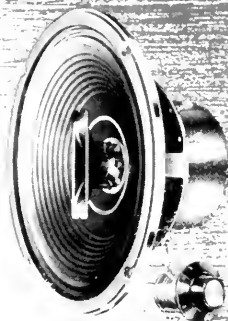
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ing on frequencies of some of the c.w. nets we find that RN-6 seems to be lacking for NCS. Several times no directed net sessions have been heard. What's the matter, boys? Come on, you code artists, let's give the nets some help. Volunteer for duty once a week. Traffic: K6BBD 170, W6FON 84, UTV 62, K6BAM 48, W6AIT 26, EXX 6.

**EAST BAY** — SCM, Guy Black, W6RLB — Asst. SCMs: Oliver Nelson, 6MXQ, for v.h.f.; and Harry Cameron, 6RVC, for TVI. SEC: WGM. RMs: JOH, EFD, and IPW. ECs: K6GK, K6ERR, W6CAN, FLT, ZZP, and QDE. PAM: LL. Your Acting SCM spent ten days at Camp Mercury, Nev., during April participating in the atomic bomb test "Operation Cue." This was a test of civil defense, and the State of California provided a 20-man communication team as a service function. Among the members of this team, besides RLB, were JN, ASL, CFS, LY, CV, OU, and WYT. There were lots of other hams there besides. K6ERR is the newest OO appointee. The Oakland Radio Club is to be congratulated on its first old-timers' night. EY's remaining was one of the high points of the evening. Prexy EDJ deserves great credit for the way he has been sparking the ORC for the past two years. YDI is one of the most faithful reporters among the OPS gang. Unfortunately Bland does not get much traffic over the Mission Trail for Martinez. One of the newest hams to have an official appointment, K6EPC is already a hot traffic man and is working DX besides. VSV and UOV keep referring to this monthly write-up as the "wasted space column," but they seem to have read everything in it. Who is kidding whom? At Travis AFB the traffic load for April was carried entirely by 3AMZ. ZRH is supervising a radar team near Washington, D. C., and reports meeting VSW and DXJ back East. Bob's CTH is 9581 TU, Sig. Corps Eng. Lab. Flid., Sta. No. 4, Fort Meade, Md. ZVV, in Berkeley, is a new AREC member. K6GK is full of ideas on how to organize traffic and sends in a new batch nearly every month. HBF soon will be active on 20 meters. All RTTY men should consider joining the MARS RTTY Net at 7:00 p.m. PDT Wed. on 3275 kc. A6VPC is net controller. See Buck for more details. Traffic: K6WAY 789, F6G 115, GK 103, W6HBF 40, K6EPC 38, W6ITH 20, EJA 12, YDI 2.

**SAN FRANCISCO** — SCM, Walter A. Buckley, W6GCC — Asst. SCM: William T. Nakahara, 6GHL. KEV, staff member of the Product Engineering Group of Eitel-McCullough, gave a talk and demonstration entitled "Effect of Varying Currents and Voltages in Beam Tetrodes." A kw. final using 4 x 150 tubes with final and power supply fully mounted and in actual operation into a dummy load was used. The Club also enjoyed listening to a talk by IBUD about the ARRL from its start to the present. The 6-meter net now has an official name, christened so by the HAMS. Hereafter it will be called the HI 50 Net locally. BDJ came in first in the April 29ers Club hidden transmitter hunt. BIP and SY trailed in second. KN6HTC, Sonoma County Radio Club secy., reports that AJF will be guest speaker at the next meeting. The Club enjoyed an hour of movies, compliments of the telephone company. BZT, stationed at Hamilton Air Force Base, requested membership in the AREC. SLX has joined the Naval Reserve Electronics Unit. Two more of the boys in the Humboldt section hope to receive tickets soon. The S. F. Naval Shipyard Club and HAMS (Red Cross Club) are making plans to edge out UW on Field Day. Having already won twice UW would get to retain the plaque permanently if they come out on top for the third round. The recent YLRC/SF drive for new members brought in ten applications from the ladies in the surrounding vicinity. KZF is busy packing cars for his new hobby of miniature railroading. He has a beautiful set-up sharing room with the ham gear. K6CQE is getting good results via 10 meters on his new 10-meter beam. GTY did himself and the local amateurs the honor of winning the National Company's contest for receiver suggestions. The prize was a complete \$1000 ham shack. JZ's board meeting at the University of Calif. brought in many local club representatives. K6GPX passed the electronic test and now is working for S.P. at Shasta, Calif. He joined the Mission Trail Net so he still could contact the boys via the net. 7TJY visited San Francisco on company business and some of the local boys joined him for dinner and a ragchew. AF6JWF and AF6GGC met many of the net members at MARS activities at the McClellan Air Force Base dinner May 23rd. PHH collected prizes for the MTN Roundup. RBQ's XYL reports that Bill is improving in health and hopes to be allowed visitors soon. SWP received the Edison Radio Award Certificate of Merit for emergency service during the 1954 hurricanes. Pat reports that he needs only Delaware to complete his WAS. YC says that LU3HR is planning a visit to San Francisco and hopes to attend club meetings here. QMO entered his first CD Party on 'phone and made 29 contacts in 14 sections. GQA says OO work was slow in April. CTH spent two weeks in the hospital with a ruptured appendix. GHI celebrated his 25th wedding anniversary with a nice dinner party. RUR and 2CDT are operating an R/C boat on Speckles Lake on 27.225 Mc. ZLQ, CDT, and RUR hope to go 6-meter mobile soon. Traffic: W6SWP 597, GQY 292, QMO 296, GQZ 50, GQA 2.

**SACRAMENTO VALLEY** — SCM, Harold L. Lucero, W6JDN — As soon as K4AQQ receives his W6 call he will

(Continued on page 102)

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be our new RM. Al obtained the required experience for this office while in Wisconsin. To all clubs: The Council of Amateur Radio Clubs would like to have each club send a representative to its meetings. Address queries to MARS Station Bldg., T-561, McClellan AFB, Calif. BSCM. K6ER is doing a wonderful job as OO. A letter has been received from the FCC with information that clubs having an examining committee can have the exams in order to give to new aspirants. BIL is the new Radio Officer for c.d. K6AKF is net control. K6ECP reported on the recent emergency in the High Country. K6BJO, on a trip to Southern Calif. kept in touch with home via radio and WVV. CMA would like to hear you check in on the CVN when you can, also keep up the good traffic count. ASI, CIS, and JN all went to the Nevada A Bomb Test for the California C.D. HTS and HSB have new B&W 5100. HVS moved to a new QTH. FNS has a new vertical at the new QTH. ZF worked CIS/7 at the bomb site in Nevada and relayed one message. DTW is active on 75 meters with a Viking Ranger. MWI has a new Viking Ranger. RNR is on 20- and 75-meter 'phone. GDO moved to a new QTH in Sacramento. K6JVI has a new mobile and formerly was at KLAUI. LLR is busy as NCS on MARS Central Div. Net. No. 1. JDN received an FB supply of MARS surplus equipment. Traffic: W6CMA 25, JDN 4, ZF 2.

SAN JOAQUIN VALLEY—SCM, Edward J. Bewley. W6GIW—SEC: EBL. RM: K6EVM. PAM: WJF. The valley clubs and groups were well represented at the sub-directorate meeting held in Berkeley. Once again we were impressed with the manner in which hams can discuss their problems and combine their thinking for the good of the majority. The Fresno Club is working very hard on convention plans and we can expect a wonderful convention, according to reports. The American Legion Net, with GRO as NCS, once again demonstrated the value of ham radio as a public service by alerting the highway patrol to free 200 snowbound motorists on Donner Pass. GRU/M was among the cars and contacted the ALN for help. Credit goes to EPB, K6EJT, and K6ECP for their work in the emergency. W6ERE has been appointed Radio Officer for Stanislaus County. K6BMM is taking over the EC duties in Merced. K6DUU is running a nightly code practice at 1800 on 1815 kc. A2 emission, by special authorization of the FCC. The Pleasant Valley Radio Club has received the call K6KKG. The Delano Amateur Radio Club will issue a Certificate of Achievement to any amateur in the world who has made complete two-way QSOs with at least five members of the Club since Feb. 1, 1953. Application should be made to the secretary, BYH. A simple listing of Delano hams contacted with the date of QSO is all that is necessary. QSO with the club station, K6BLI, will count. Members now active on the air include: ARI, BRP, BVM, BYH, EFV, HT, K6ELZ, W6HYK, WNX, ZEK, ZVP, K6JVSJ, KN6ECB, KN6GZY. Traffic: (Apr.) W6FEA 337, ADB 72, K6EVM 33, W6WJF 25, EBL 24. (Mar.) W6ADB 78.

### ROANOKE DIVISION

NORTH CAROLINA—SCM, Charles H. Brydges, W4WXX—SEC: ZG. PAM: ONM. RM: VHH. AGI is permanently on 40-80-meter c.w.-'phone. AKQ will operate the station most of time except during the summer months when YZC and YE from Virginia will be at the helm. AGI will be active in CD Parties as an ORS. KN4AV has a new S-86 receiver and is on 40 and 80 meters. FOU is back in Blowing Rock and is working on MARS gear. ZYC was elected NCS of the Tarheel Net for the month of May. YPY is getting good results with DX on 20 meters with his Globe Scout at 40 watts. A very nice picnic was held at KN4BVQ's cabin on the Catawba River, with members of the Charlotte Amateur Radio Club attending. BDU, VHH, and WXZ were active in the C.W. CD Party. HVK is mobile in the Charlotte Area. The Confederate Teen-age Net on 3900 kc. is going very well. You older fellows are invited to check in. BUA is building a 36-tube receiver. SOD has a Viking Kilowatt and has applied for OBS appointment. HKB reported in the Virginia Phone Net to help with disaster traffic out of Bowling Green, where the big forest fire had caused much destruction. WXZ also relayed. I have received a few letters from interested people about the traffic net to be held on Saturdays. If interested, please drop me a line so plans can be made soon. EQJ needs only South Dakota for her WAS award. The OM, EJP, has 43. AH has some TV antennas above his 120-foot high 20-meter beam, and receives 8 channels, not to mention all the DX. If you want convenient monthly report cards to send in to the SCM, just send your call and address on a post card and they will be mailed right out to you. Traffic: W4WXX 208, YPY 28, AGI 2, EJP 2.

SOUTH CAROLINA—SCM, T. Hunter Wood, W4ANK—The Florence Club was host to Ed Tilton, V.H.F. Editor of QST on May 6th. TSU is building a new kw. rig and is now working 20 meters. FM reports that maintaining batteries for his emergency rig did not prove practical so he converted it to a portable rig that will operate from a car battery in a pinch. LXX reports that he recently became a member of the OTC. FGX is on 40-meter c.w. looking for South Dakota and Idaho for WAS and placed 3rd for South Carolina in the SS Contest using 40 watts

(Continued on page 104)





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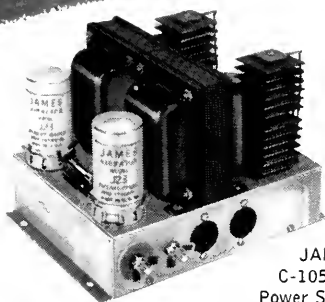
\*Prices are for crystal only. To insure this tolerance crystal must be purchased with oscillator factory wired and tested. For total price add \$6.95 to price of crystal desired.

**HOW TO ORDER:** In order to give the fastest possible service, crystals and oscillators are sold direct. Where cash accompanies the order, International will prepay the postage; otherwise, shipment will be made C. O. D.

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The FIRST MOBILE POWER SUPPLY designed by amateurs for amateur equipment...incorporating these unique features:

- 6 or 12 volt operation through simple tap changes
- Transmitter power up to 500 volts at 200 MA with simultaneous low voltage power
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Buy a JAMES Power Supply to professionalize/simplify your mobile installation.

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W9JQB

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# JAMES

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AUL is building a 500-watt rig. K4AIB reports from the Greenville Club that members are adding 2-meter rigs and looking for a new club room. K4AQQ/h, formerly of Myrtle Beach, now is located in Susanville, Calif. The following have qualified for SC C.W. Net certificates: AKC, ANK, CHD, KYN, RPV, YAA, FML K4AQQ, and W9JBN/4. If you have qualified and did not get the certificate, contact W4AKC. The SC C.W. Net has closed down for the summer but members are requested to get together on 3795 kc. for rag chews during the off season. Traffic: (Apr.) W4HDR 217, Z1Z 140, ANK 12, FM 3. (Mar.) W4HDR 237, TSU 16.

**VIRGINIA** — SCM, John Carl Morgan, W4KX — SEC: RTV. Your SCM had nice visits with the Richmond ARC and the Rappahannock Valley ARC and now is a member of the latter. Club activity is at an all-time high. The Blue Ridge ARC (Roanoke) threw a nice hamfest. BYZ reports a new club has been formed in Danville. PXA sends a roster of the Southwest Va. ARC, representing Wythe, Montgomery, and Pulaski Counties, and having 100 per cent AREC members. The VFN picnic is scheduled this year at HQN's antenna farm in Bumpass, NV, host heretofore, is QRL with the Tidewater Area gang's preparations for the Division Convention at Old Point. Summer doldrums and QRN are hitting the nets. VSN and VN have curtailed until fall. VFN continues 7 nights a week. PXA, VN mgr., wants volunteers from among the newer hams for summer NCS tricks. BLR took traffic honors in April. Kay made BPL in the process! PCF's total took a dive because operator 3QQE was QRL rifle range. Don, of K4MC, had his overseas orders cancelled and now is getting 3WDP/4 fired up. BLR took high c.w. honors, and HLF high combined c.w./phone in the YL/OM Contest. JUJ got a WANE certificate. CIT and DQI combined for the exhibit station at the Arlington Science Fair. SPE, MCL, WJJ, JFV, and UGO are sidebanding. AAD is completing the kw. rig and planning s.s.b. AJJ reports KN4ASI was drafted. LW and YKB are QRL Navy cruises. K4ASU is turning in good traffic totals and meeting all Virginia nets. A QSL was received from KFC as the anniversary of the last exchange 20 years ago when we were 6KFC/3KU. He wants to repeat in 1975! YZC reports he, pappy YE, and kid brother KN4CAX will summer in North Carolina operating as AGI. Traffic: W4BLR 695, K4ASU 105, W4AMZ 46, TVO 42, YKB 32, K4MC 28, W4AAD 13, AJJ 12, IA 9, RGZ 7, BYZ 5, IF 3, CGE 2, LW 2.

**WEST VIRGINIA** — SCM, Albert H. Hix, W8PQQ — SEC: YPR. PAMs: FGL and GCZ. RMs: DFC, GBF, HZA, and JWX. BWK is quite active now, as is PZT. The Princeton Club held a big picnic June 5th. GCZ started a code class last fall for seven boys; five now have their Novice tickets. Congratulations, fellows. Let's hear from you. A new Novice in So. Charlestown is WN8WHQ. Welcome to the fold. SHG is plugging away at WAS. CHP is doing a good job with the Globe King. NYH has new Match Box and Coax Ratiometer and is well pleased with them. PZT has a Wheatstone tape punch and keyer which sure sounds good. JWX has a new Johnson rig and is doing a bang-up efficient traffic job. GCN is on s.s.b. and has a very good signal. SNP is getting along very well with his bug. The Tri-City Club meets the 1st Fri. of each month at the Naval Reserve Armory, South Charleston. All are cordially invited to attend. CLZ has a new Johnson KW. He installed a key-click filter in the Ranger which sounds very good. Traffic: W8GBF 139, JWX 126, GEP 87, HZA 87, PZT 70, BWK 35, DFC 16, UYR 16, NYH 6, KDQ 4, PQQ 4.

## ROCKY MOUNTAIN DIVISION

**UTAH** — SCM, Floyd L. Hinshaw, W7UTM — GPN, in support of the ARC of Ogden, conducted another simulated disaster test Apr. 15th. Emergency power was used with communications being carried on 75 and 2 meters. JPN now is all set up and waiting for openings on 6 meters. Hal also advises the local activity on 2 meters is improving. RQT and the Ogden Club held another hidden transmitter hunt with FB eats after. The June V.H.F. Party will find QDJ and his Davis High pals atop a nearby mountain in an effort to increase the DX possibilities. NIB is busy fabricating a new steel tower and waiting for the new fishing season to open. SP has rebuilt and overhauled his 6-meter gear and will be on hand when the openings come. Traffic: W7JPN 12, UTM 6.

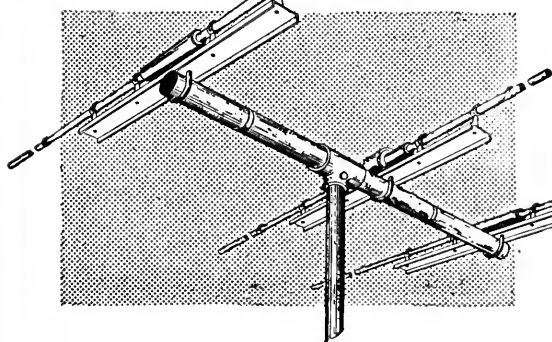
**WYOMING** — SCM, Wallace J. Ritter, W7PKX — Pony Express Net members handled all National Guard communications during the recent National "Minute-Man" alert in professional manner, thanks to the organizing of MWS and the excellent cooperation of all who participated, those who helped clear frequencies, etc. Congratulations, fellows, on a job well done. The Sheridan Radio Club had a display and station JMN in operation during the annual Arts and Crafts Exhibit with some traffic handled. HDS, with the help of NCS PAV, is collecting weather reports on the morning session of P. E. Net for the U. S. Weather Bureau at Cheyenne. PAW is doing lots of mobile work while commuting to and from work. Because of the work of LRU and PMA (EC), the Sheridan Club now has ground allotted by the County for a club house and start of a c.d. emergency

(Continued on page 106)

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## The New -- 15, 20 and 40 Meter



Now, for the first time, the amateur can select from a FULL line of professionally engineered short antennas. All aluminum construction, with coils enclosed in weatherproof bakelite containers with coil assembly #12 formvar wire. Will handle 1 KW. 52 ohm match. Turns with a T.V. rotor.

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6 ft. boom. Forward gain 4.4 db over full size reference dipole. Front to back ratio 15 db. Tuned 14,250 Kc. Approximate weight 15 lbs. Longest element 16 feet.

MODEL R.S. 2-20  
AMATEUR NET

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### 20 Meter, 3 Element Shortbeam

16 ft. boom. Forward gain 4.8 db over full size reference dipole. Front to back ratio 20 db. Tuned 14,250 Kc. Approximate weight 20 lbs. Longest element 16 feet.

MODEL R.S. 3-20  
AMATEUR NET

**\$59<sup>95</sup>**

### 15 Meter, 2 Element Shortbeam

6 ft. boom. Forward gain 4.4 db over full size reference dipole. Front to back ratio 15 db. Tuned 21,350 Kc. Approximate wt. 15 lbs. Longest element 13 feet.

MODEL R.S. 2-15  
AMATEUR NET

**\$44<sup>95</sup>**

### 15 Meter, 3 Element Shortbeam

12 ft. boom. Forward gain 4.8 db over full size reference dipole. Front to back ratio 20 db. Tuned 21,350 Kc. Weight approximately 20 lbs. Longest element 13 feet.

MODEL R.S. 3-15  
AMATEUR NET

**\$54<sup>95</sup>**

### 40 Meter, 2 Element Shortbeam

12 ft. boom. Forward gain 4.4 db over full size reference dipole. Front to back ratio 15 db. Tuned 7250 Kc. Weight approximately 30 lbs. Longest element 33 feet.

MODEL R.S. 2-40  
AMATEUR NET

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### 40 Meter, and 80 Meter Shortdublet Coils

40 Meter Shortdublet coils—7200 Kc.—16 feet—32 feet total. 80 Meter Shortdublet coils—3900 Kc.—31 feet each leg—62 feet total.

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Per set—each band

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communications center. The "YO" Net, on 3610 kc., is going fine with approximately 15 regular check-ins, and would like to see more of the Pony Express gang QNI c.w. Traffic: W7PKX 280, HDS 128, PAV 25, MNW 17, VXX 12, 11 L 7.

## SOUTHEASTERN DIVISION

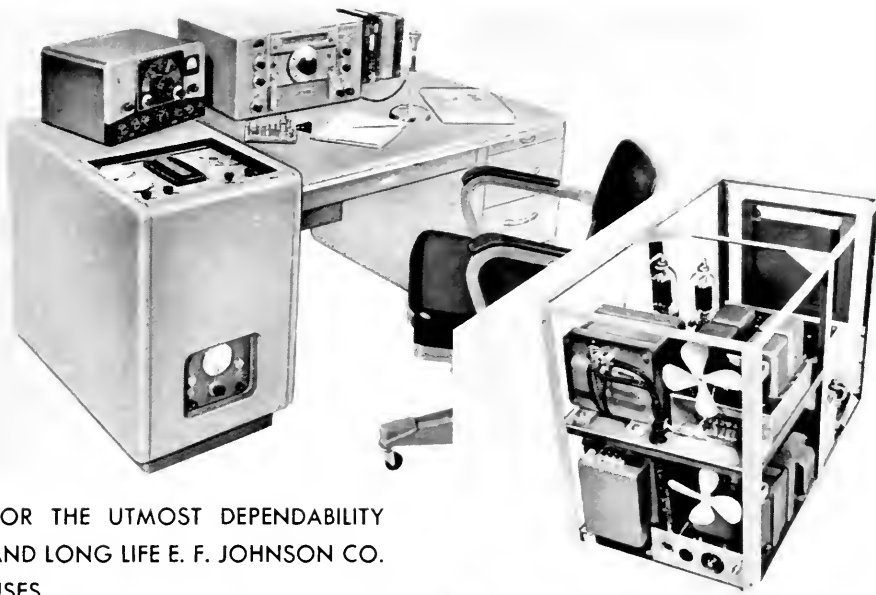
**ALABAMA** — SCM, Joe A. Shannon, W4MI — SEC: TKL, RM: KIX, PAM: RNK. The section has lost a most active member in George, chief operator at K4FDY and a mainstay on AENP, who has been transferred. Montgomery's new local emergency net, AENK, is doing an excellent job with HY1 as manager, averaging twenty call-ins each Sun. at 1300 on 3940 kc. ZSQ is warming up to c.w. and has plans for a battery-powered emergency rig. RNK reports that his 30K is in good shape again. VYI has moved into the new home and has the "power house" going strong again. KN4BJY has the DX fever and says the gang at St. Bernard includes GUR, BFT, WN4FTO, WN4HFZ, KN4BJY, and KN4ASJ. K4AOZ jacked up the antenna another 25 feet, installed baluns, and is laying down a good signal with the Viking 1. K4APF, the XYL of K4AOZ, is a new member of the Southern Belles Net. GET and OLG are new Asst. ECs in Birmingham, and EBD reports that AENR had a total of 134 call-ins during April. Reports on April activity were received from three Novices. Let's have more cou on the doings of our newcomers. Traffic: W4COU 1131, K4FDY 1038, W4UHA 513, HKK 107, WOG 107, KIX 92, EJZ 81, ZSQ 49, TKL 37, CEF 35, ZSH 25, RLG 20, HY1 19, RNK 14, ZWE 10, CAH 9, TXO 8, USM 2, VYI 2, KN4AJG 1, BJY 1.

**EASTERN FLORIDA** — SCM, John W. Hollister, jr., W4FWZ — The numerous letters I receive tell a remarkable story of ambitious amateurs wanting to get things done for ham radio. Emergency preparedness is certainly the watchword. Special praise goes to our work horses, the Emergency Coordinators. Gainesville: The GAS (100 per cent AREC, too) mobileers held their first simulated drill on 29 Mc. and EC WEM reports perfect county coverage. TJU, mgr. of TPTN, issued the first net bulletin, *The Unmodulated Carrier*, and opines, "A traffic net is a series of breaking stations interrupted by messages." Key West: ELS is using 'phone patch. So long to ZUS, who will be a VO3 on a.m., c.w., and s.s.b. LaBelle: HDU is using a Viking Ranger. Lake City: YNM says the USNR station is K4NCS. Lakeland: UMI reports hams will hold a series of open-house balls for the public. Melbourne: BWR reports increased AREC membership. Miami: IYT reports the Assistant EC for Coral Gables is IQF. The town is providing complete facilities for the AREC/DEN at the police station. PBS says the DEN was called out for the FNG alert/mobilization. PBS and IQF called a surprise DEN drill. IYT and PBS report that Radio WAHR (LUS, prop.) carries "Calling CQ" each Sat. a.m. for a half hour. Your SCM would like to have comments from anyone hearing this program. PBS is remodeling the shack. St. Petersburg: Convention? It was the best. Tampa: New club officers are LAW, YDI, ALP, and YFI. Jacksonville and Miami were enthusiastic about the visit of Ed Tilton. Jacksonville will set up an Armed Forces station again. The RACES plan has been approved for Orange, Dade, and Sarasota Counties. Traffic: (Apr.) W4PUJ 513, TJU 221, ELS 148, BWR 109, YJE 74, WS 70, LAP 68, K4ANW 42, W4WEO 42, ZIR 37, IYT 29, IM 27, SVB 23, FSS 17, BZI 16, LMT 15, PBS 10, KN4AAA 8, W4RWM 8, DES 7, HDU 6, WEM 6, FWZ 5, EHW 4. (Mar.) W4LMT 47, RWM 21, EHW 1.

**WESTERN FLORIDA** — SCM, Edward J. Collins, W4MS/RE — SEC: PLE, ECs: MFY and HIZ, K4AKP makes BPL, the second month in a row. GMS is looking over s.s.b. gear. BGG wants mobile gear for the Ford. AXP is reworking the main power supply that failed during LO Nite. We regret to report the passing of UCY's mother. CCY wants more and more power. DAO, RZV, PQW, ZUN, HJA, BZX, TTM, UUF, and MUX all meet the gang on the Pensacola Party Line each Sun. a.m. UUF keeps the 144-Mc. DX under control. QK meets the Hurricane Net and enjoys late-hour QSOs. KN4CLJ is keeping the air hot with his Adventurer. KN4CLK is another newcomer in Pensy. KN4IBK is gathering the QSLs. PAA wants new tower and beam. MS wants a 51SB to go with the 5100. ZPN and VR are the 7-Mc. c.w. men. JP'D keeps 7-Mc. 'phone hot. KN4AEP has antenna troubles. FHQ keeps an ear on the bands. HQG is planning a get-together with UUF. EAR wants to increase power. Traffic: (Apr.) K4AKP 1091. (Mar.) K4AKP 786.

**GEORGIA** — SCM, George W. Parker, W4NS — SEC: OPE, PAMs: ACH and LXK, RMs: MTS and OCG. Nets: The Georgia Cracker Emergency Net meets on 3995 kc. Sun. at 0830, Tue. and Thurs. at 1900. The Georgia State Net (GSN) meets on 3590 kc. Mon. through Fri. at 1900. BWD now is on 40-meter c.w. with an ARC-5. DDY is going great guns on 80 meters and has made BPL for two months now. KN4BXD is a new Novice in Quitman. HYV now is Radio Officer of the Atlanta Metropolitan Area C.D. YUM now is active on 15 meters. YWP has a new HQ-140 and has rigs ready to go on 6 and 2 meters. KN4CZR is the XYL of CFJ. New appointments: DWE as EC for Hart and

(Continued on page 108)



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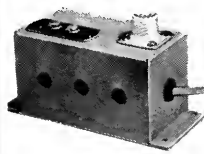
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Power Output:  
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Elbert Counties, KGD as EC for Lumpkin and White Counties. The Georgia Cracker Club will hold its annual meeting and picnic at Lake Blackshire, near Cordele, on Sun., Aug. 21st. Nine new Novices are awaiting their calls after completing the course offered by the Atlanta Radio Club. ZD, MTS, and KOR, the licensing committee, and instructors have announced the formation of a new series of classes for Novice and General Class. Thanks for the nice crop of reports this month. WKY now is mobile. CVY is getting the bugs out of his new mobile rig. PYR has a new Elnac receiver and transmitter. Let's have a little news along with those reports, fellows. Traffic: W4OCG 151, DDU 143, PIM 105, CEJ 82, YWP 79, ZDP 55, DJW 45, HYV 35, ZUF 29, ZD 26, NS 24, BWD 22, ZWT 20, MTS 16, HYW 8, YTO 8, YUM 7, BXV 4.

**WEST INDIES** — SCM, William Werner, KP4DJ — WR is new Aquadilla District EC. QR is on with a new Viking II, Matchbox, Windom antenna, and HQ-140 receiver. WT reports to the Weather Net on 3865 kc. daily at 7 A.M. and 5:30 P.M., plus the AREC Net on Wed. at 8 P.M. on 3925 kc. ABD and NY have new Globe King 500 transmitters. CO's emergency battery-powered transmitter is a Collins TCS9 working off 12 volts. QR's ground consists of a h.c. station's 120-wire radial system. UT has both a 12-volt and 110-volt power supply for new PMR6 receiver. DV is using an Elnac mobile rig to drive the kw. final at the home station. TZ transferred to Fort Sheridan. WR uses a Windom antenna on 80 and a folded dipole on 20 meters. WV burned out the power transformer in the receiver. PZ uses three-wire folded dipole with 640-ohm line on 75 meters. VA, the College of A.&M. station, uses a pair of 813s and speech clipping. PZ is building a speech clipper. AZ and JE are using vacuum-tube keying. RL has a Viking I. DJ is using half-wave 600-ohm line for 80-meter operation. NCSs of the 3559-ke. Net will look for answers from Novice stations on 3700/3750 kc. ABA is building an 813 transmitter. ABI is using a pair of 807s. ABD and ZC built 20-meter beams. RA is using a 40-meter antenna on 80 with an antenna tuner. RM bought a Mon-Key. ABA received a QSL for the first DL QSO on 3.7 Mc. CS joined the AREC. AAC was the section's high scorer in the SS. The PRARC has formed a ladies' auxiliary. Traffic: KP4WT 45, ZW 38, DV 2.

**CANAL ZONE** — SCM, Roger M. Howe, KZ5RM — KZ5FL, HK3AA, KZ5NM, and HC1CB did a fine job on some emergency traffic and probably saved a man's life by getting an iron lung from the Canal Zone to Bogota, Colombia, in a very short time on Apr. 24th. Also FL is keeping the civil defense sked with W4YB while DG is on her vacation Stateside. DG and GD were hosts for the radio club party at their home recently. Kurt Carlsen, W2ZXM/mm, was in Canal waters recently but did not get a chance to come ashore. EP, a charter member of the "washer gang," now has a 10-over-15-over-20 array. JD, DG, GD, JF, EP, RM, KA, PL, and PP are among those reported to be on vacation Stateside. Vice-President AE is doing a good job of running the CZARA while Prexy JD is on leave. BE checks into the traffic exchange on 7165 kc. daily at 1930 EST. Traffic: KZ5WA 70, CF 40, DG 22, BE 21, KA 13.

## SOUTHWESTERN DIVISION

**LOS ANGELES** — SCM, W. J. Schuch, W6CMN — SEC: QJW. RMs: GJP and BHG. We regret to report the passing of Horace Bodine, LJU. The Two Meter and Down Club will miss him very much. The Hamilton High School Radio Club has a new Viking Ranger. New officers are QXH, pres.; QIB, secy.; and K6JLY, parliamentarian. The Club also has a new all-band ground-plane antenna. K6LYF has joined the Mission Trail Net. PZN has 600 watts to an 806. K6COP has a new Q multiplier and S-meter on his NC-88. QJW reports the section leads the nation in activity under AREC/RACES for any section with 1428 AREC members, including 487 RACES authorizations. BEQ raised his 7-Mc. antenna and the wind immediately lowered it for him. AM is installing his fifth final. HIF is back at work after a long illness. Good luck, Walt. K6KMIJ has a new Viking II. RW now has 242 countries worked with 232 confirmed. MBW has a new 818 rig and is active on SCN and TCRN. KN6HOV now is on 40- and 15-meter c.w. with 75 watts. BUK has a new Dodge and is QRL installing mobile. USY skeds KA2USA on 14 Mc. The Pacifico Radio Club had a party and guests were UID, K6GHP, EEO, CEO, and BFC. ZDO has a clean bill of health from the TVI Committee on his 50-Mc. rig. CMN is polishing up fish hooks for his vacation in June and July. KN6HPZ has a Johnson Adventurer rig and has worked about 20 states so far. QWN finished basic training and moved on to Denver Armament School. K6DIK is active on 6 meters. QVS has a new s.s.b. exciter. K6DQA now has 10-meter mobile in the car. KL7NXI now is W6KWS. Traffic: (Apr.) W6GYH 313, K6EJT 289, W6USY 276, CMN 211, WPF 208, MBW 158, BHG 154, K6DQA 144, W6MLZ 108, CAK 96, GJP 65, HIF 54, KN6JUN 41, K6BWD 40, COP 37, EA 33, W6ORS 27, YVJ 21, KN6HOV 18, W6TDO 15, CK 14, EYII 12, K6LYF 7, W6AM 6, PZN 6, CBO 5, NTN 3, BEQ 2, K6ELX 2, (Mar.) KN6JUN 24.

**SAN DIEGO** — SCM, Don Stansifer, W6LRU — Asst. SCMs: Tom Wells, 6EWU; Shelley Trotter, 6BAM; Dick

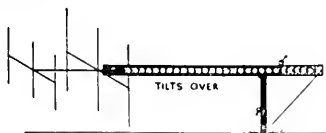
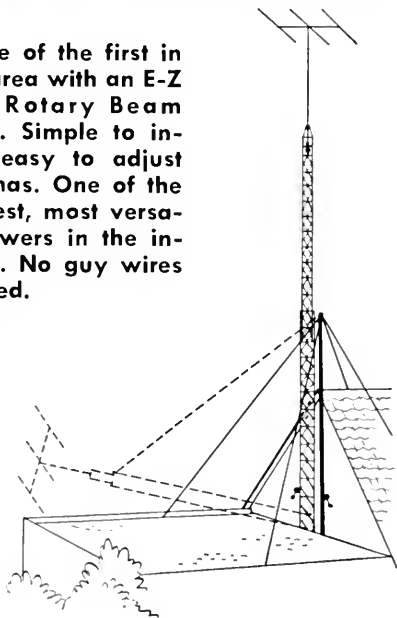
(Continued on page 110)

# THE ANSWER TO A HAM'S DREAM!

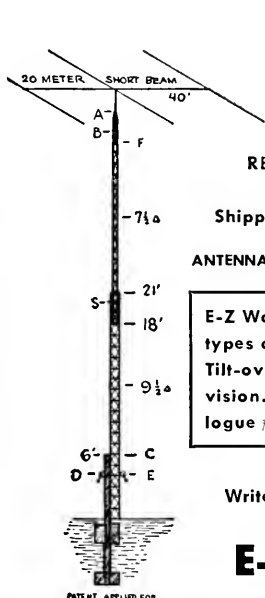
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- GIN POLE mounting is 20'
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- pipe with double hinged
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70E8A-VFO.....	97.50
35C2 lo-pass filter.....	40.00
8R-1 100 KC crystal calibrator.....	25.00
Conversion kit for 75A2, with 3 KC mechanical filter	80.00
Plug-in adapter for 75A1, with 3 KC mechanical filter	65.00
Plug-in 3 KC filter adapter for SP-400.....	65.00
Plug-in 3 KC filter adapter for HRO-60.....	65.00

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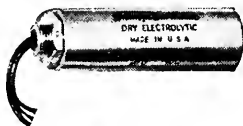
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Better than a crystal filter—Sharpen the selectivity of any receiver—Eliminate heterodynes—Simple to connect—No changes to receiver.

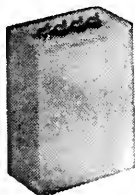
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Huddleston, 6DLN. SEC: VFT. ECs: BAO, BZC, DLN, IIFQ, H1L, IIR1, IBS, KSL, KUU, and WYA. RM: ELQ. The annual Upper Ten Picnic will be held on July 10th at Glenn County Park near Cardiff. The usual good time is assured. IZG again is handling traffic after a switch in QT11 to National City. BAM, an old-time DX and traffic man, is checking into the SCN when work permits. K6DBG, W6OZO, PEJ, TGB, KN6IBY, and GPG provided ship-to-shore communications for the Orange County Outboard Club, with help from K6BEC, fixed, and FBF, mobile, in San Diego. New officers of the Coronado Club are K6AZW, pres.; K6BCG, vice-pres.; EDG, secy. VJT, president of the Upper Ten Club, has resigned because he was called to duty. K6BPK is offering code and theory classes to interested YLs and XYLs. The Palomar Radio Club had a fine program with IAB, at Camp Pendleton, for Armed Forces Day. The Orange County gang continues to have one of the finest mobile groups in the State. SYA and his wife vacationed to Florida with their new house trailer. The c.d. drill held by members of the Gillespie Amateur Radio Club was an outstanding success. Operating was done under conditions not expected for that time of the year, with rain, hail, snow, and extremely high winds. The entire group provided excellent communications and the results were beyond all expectations. With summer here all points toward camping, fishing, and that long-awaited vacation. Happy traveling to all, but please keep me posted so our column will continue to have more than just a heading to it. Traffic: W6IAB 3159, YDK 453, IZG 231, K6DBG 34, W6KVB 30, BAM 1.

**SANTA BARBARA**—SCM, William B. Farwell, W6QIW—Greetings from your new SCM and thanks for your support. New appointments: W6REF/6 as RM, K6ATX as OES, K6IPF as OBS. 3RNY is the new operator of K6CST at Point Mugu. AGO was appointed Act. Mgr. of the Paso Robles Club. TOP is back in Chicago for special training. MSW is the proud papa of a YL harmonic. CMR won a scholarship award. FYW says all he gets is more cats. Hi. K6CJ, Santa Maria; K6BOU, San Louis; and W6JFP, Guadalupe, are new stations on 2 meters. DX hounds take note: KN6IRM passed the Tech. Class exam. That buzz you hear from GH is not his rig, but a bee hive in the wall of his shack. The Santa Barbara Radio Club was 35 years old in May. Congrats! MWA now sports a half-gallon rig. IGH is installing all-band mobile in the new car. The new section c.w. net (SBN) meets Mon., Wed., and Fri. at 1845 DST on 3600 kc. K6NBI tops in traffic again. Traffic: K6NBI 279, W6REF/6 132, QIW 20, YCF 14, FYW 3.

### WEST GULF DIVISION

**NORTHERN TEXAS**—SCM, T. Bruce Craig, W5JQD —SEC: RRM. PAMs: PAK and IWQ. RMs: PCN and QH1. OXO is ex-4AYG, formerly an SCM. BPT reports KN5ADI is a new Novice in Palestine. The Abilene Amateur Radio Club elected ANL, pres.; VFP, vice-pres.; DEG, secy.-treas. The North Texas C.W. Net handled 169 pieces of traffic in 16 sessions. The DARC is active in civil defense planning. ZTG has a new 4-125A rig on the air now. HKF reports the Terry County Radio Club is making contacts on emergency power. The Odessa Amateur Radio Club sponsored a successful hamfest recently. NW acted as MC at the barbecue luncheon served by the famed Chuck Wagon gang. AFR reports on the East Texas Amateur Radio Club's annual hamfest. RHP was a Ranger. RRM was the principal speaker; MCs were LZV, IQW, and WJ1. The 75-meter transmitter hunts were won by QWJ and OLD; the 10-meter transmitter hunts by KMH and TUU. The Texoma Amateur Radio Club of Sherman had emergency duty on April 6th, when a tornado struck in the area. Those participating were UTB, IDZ, POG, LDG, SGR, DGG, and UIQ. Public recognition of the part played by amateurs was written up in the Sherman paper by Civil Defense Director Dick Raggsdale and Auxiliary Police Chief Raymond Tucker. The East Texas Amateur Radio Club participated in the Warm Springs Foundation Telethon on March 19th and 20th. Stations participating were ZJM, MAW, HBD, OIS, CTF, HAJ, IJY, VAN, WYH, IWQ, FOY, YIU, AFR, AFY, AFW, IZU, and WVH, who reported. Traffic: K5TFB 1202, K3FFB 1101, W3DTA/5 807, KPB 597, ACK 220, AHC 199, FJB 194, UBW 194, ASA 78, TTU 57, CF 24, ZTG 20, FCX 13, BPT 8, OCV 8, FIT 7, EOZ 6, TFP 5.

**OKLAHOMA**—SCM, Dr. Will G. Crandall, W5RST —Asst. SCM: Ewing Canady, 5GIZ. SEC: KY. RM: GVS. PAMs: PML, SVL, and ROZ. New officers of the Tulsa ARC are SWJ, pres.; AAL, vice-pres.; DCF, secy.; EYK, treas.; KY, pub. rel. New officers of the Pittsburg Co. ARC are UAO, pres.; OQM, vice-pres.; GXH, secy.-treas.; AKH, pub. dir. Tulsa Central I.L.S. has plans for a station. ORH has 300 watts mobile on a.s.b. PZW has moved to Kansas City, Mo. TFC pulled two awards at two college science fairs for a photo-voltaic-cell powered transistor audio oscillator. The ACARC has incorporated and now has 55 members, all ARRL members. FCV is a new ham at Enid and light surgeon at Vance AFB. GVS reports increased activity on OIZ, the Oklahoma c.w. net, which expects to continue operation all summer. An attempt is being made to better the present auto license plate bill to

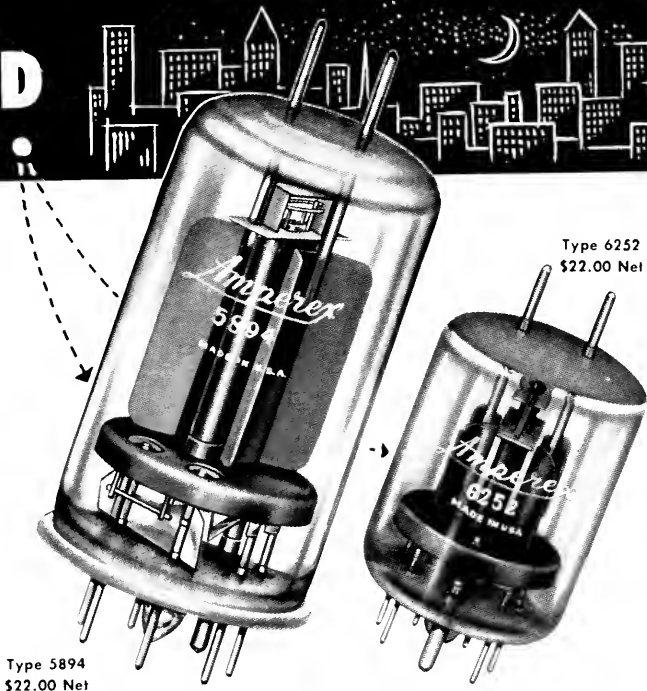
(Continued on page 112)

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		Plate Input Watts	Plate Volts	Plate Input Watts	Plate Volts
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Modulated	220-225	72	600	44	370
Telephony	420-450	51.5	475	31	300

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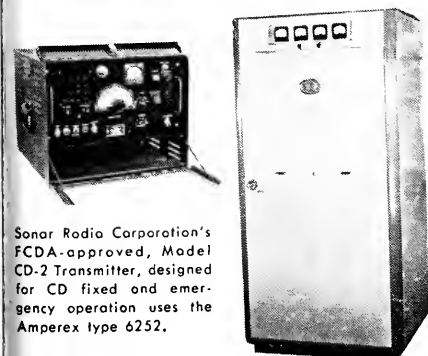
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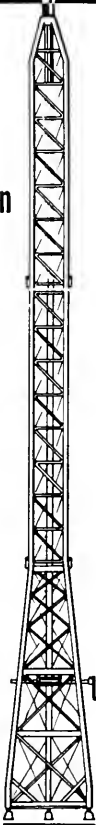
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provide two plates in lieu of the regular plate and available for mobiles only somewhat similar to the present Texas and Virginia laws. Thanks are due Senators Wilson and Frazier and Rep. Norman for authoring the bill and we should do all we can to persuade its passage. We cannot stress too strongly courteous driving practices and extreme caution while mobiling. The h.f. bands are on their way back, as witness the 15-meter band which is very hot at times. Traffic: W5PMJ 791, FEC 583, GVS 322, JXM 251, HCG 144, MGK 78, SVR 67, GXH 63, ZKK 58, QAC 52, FU 48, CBY 46, PNG 45, ADC 44, TNW 42, MFX 31, RST 31, CFG 29, MQI 16, CXM 11, ESB 8, ITF 8, SWJ 7, UCT 3, PAA 2.

**SOUTHERN TEXAS**—SCM, Morley Bartholomew, W5QDX—DTJ and ZIN are fighting it out to see who gets WATC (Worked All Texas Counties). MN still is spending most of his air time handling traffic. YXH is building a new kw. c.w. rig. Vince says the jr. operator, EDG, is crowding him. Congratulations, Vince, on qualifying for Class 1 OO. GQ is on 75 meters with a 20A s.s.b. exciter. JKC and LDU have moved to Fort Worth. UB gave a talk on s.s.b. advantages to the SARC members at their regular meeting. SMG received his "Greetings" from Uncle Sam. We'll miss him around these parts. FJX is back on the air at his new QTH in San Antonio. The Austin mobile gang is active on 29.200 Mc. Hidden transmitter hunts are staged every Saturday night. QEM is your new SEC. If you are interested in becoming EC for your city and are willing to devote the time to it, contact Roy. QZJ is EC for the Austin Area. Mobile operators: Now is the time to fill out and file Form 53 for your 1956 call letter plates. You must make applications each year. October 1st is the deadline. Traffic: W5MN 786, DTJ 24.

**NEW MEXICO**—SCM, Einar H. Morterud, W5FPB—SEC: KCW. PAM: BIW. V.H.F. PAM: FPB. RM: JZT. The NMEPN meets on 3838 kc. Tue. and Thurs. at 1800 MST, Sun. at 0730; the NM Breakfast Club every morning except Sun. at 0700-0900 MST on 3838 kc.; the NM C.W. Net daily on 3633 kc. at 1900 MST. Balloting for SCM resulted as follows: FPB 100, BIH 69. K5AQK reports into the Breakfast Club from Clayton. Other calls heard on 3838 kc.: BRV, AGX, KMC, BWV, BLO, GZG, GQA, DVA, FGH, VIA, HVE, FEF, COS, BCT, RNG, EFT, CHX, GGO, and HOE. New officers of the Hobbs ARC are: RES. pres.; JVX, vice-pres.; Harold Windle, secy-treas.; FTP, act. mgr. ZU, as retiring SCM, wishes to thank all who diligently reported activities, and the gang who were always in there for net activities. Let's have more make BPL to qualify for the BPL traffic medallion described on page 73, May QST. QR has had bad dust static during recent months at Presbyterian Sanatorium and is unable to get on because of his health. AKR reports hospital QRM. Traffic: K5WSP 891, W5RFF 134, JZT 110, CEE 49, ZU 23, BZB 13, BZA 7, BXP 4, DWT 4, HOE 4, WBC 2.

### CANADIAN DIVISION

**MARITIME**—SCM, Douglas C. Johnson, VE1OM—Asst. SCM: Fritz A. Webb, 1DB. SEC: RR. New appointees: FH, Cape Breton EC: AAY, N.B. EC: ABZ and WK as OPSS. Ex-1HT now is WP. ZL is ex-1EBand VO6EP. SM7MG was a recent visitor to Halifax. Ex is active on 75 meters with 35 watts. Newt depends on a 500-watt plant for power. ACL reports formation of the PEI Emergency Net. DQ is heard from his Grand Lake summer QTH on 75 meters. LZ is with CBC in teleline work. VO2B has left for Ottawa. VO1T assumes duties as c.d. communications officer. VOID is an EC. AECs are VO1T and VO1AB. VO1AB has a new mobile and held a transmitter hunt in April. VO1AM and VO1AN are on 'phone. VO2CM is building a new all-band rig. VO2AG is QRL with mobile gear. VO2AW is going linear. W4SIY-VE1 is operating from Shelburne using a Viking Ranger. IC is going north for the summer as operator on the CGS *Cornwallis*. VO6U plans to go on 50.44 Mc. VE1GH is being heard again on 20 and 75 meters. The ARRL Maritime Convention will be held at St. John the last two days of July. UT expects to be mobile shortly. The Maritime 'Phone Net meets every evening on 3750 kc. at 7:00 ADT and will welcome visiting U. S. mobile stations calling in when up in the VE1 area. This net ties in with the TCPN and can QSP any messages back home. I/I is heard on 75 meters operating from Camp Gagetown, N. B. Traffic: VE1FQ 180, DW 175, VO6AH 109, VE1OC 70, VO6U 62, VE1QM 60, VO1T 48, VE1AV 46, OM 29, VOID 26, VE1UT 21, ME 18, BL 12, GA 10, WK 7.

**ONTARIO**—SCM, G. Eric Farquhar, VE3IA—The Nottown Club of Toronto was host to Lee Aurick, W1RDV, Assistant Secretary of ARRL, who addressed the meeting on the legislation of ham radio and showed the film "Ionosphere and Effect on Radio Waves." NG shares a new transmitter with the XYL, DZA. AVS, DTO, and DAR now are mobile. RU has returned from Mexico, DTO and DIL now are Class A. BUR keeps early morning skeds with the help of a new receiver, PH mobiles to the Maritimes. AUU enjoyed the Oshawa Hamfest. AQE and AWQ attended the Dayton Hamvention. AWQ was the happy winner of a Collins transmitter. The fingers of BSW lost out with the garage door in an accident. The Ottawa Club

(Continued on page 114)

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Collins 32V1.....	895.00	B&W 51SB.....	279.50	PRO-310.....	595.00
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Ranger Kit.....	214.50	Central 600L.....	349.50	Hallicrafters SX99	149.95
Ranger wired.....	293.00	Elmac PMR 6 or 12	134.50	Hallicrafters SX96	249.95
Viking II kit.....	279.50	Elmac AF-67.....	177.00	National SW54.....	49.95
Viking II wired.....	337.00	Morrow 5BR1.....	73.45	National NC88.....	119.95
VFO kit.....	45.50	Morrow 5BRF.....	66.59	National NC98.....	149.95
VFO wired.....	62.50	Morrow FTR.....	125.83	National NC125.....	199.95
Adventurer kit.....	54.95	Gonset Super 6.....	52.50	National NC183D.	399.50
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### Beam Pentode

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Voltage 6.0 v.

Current 3.5 a.

#### Screen Grid Rating

Voltage (max) 600 v.

Diss. (max) 10 w.

#### Plate Rating

Voltage (max) 2000 v.

Current (max) 150 ma.

Diss. (max) 75 w.

## PL-4D21

### Beam Tetrode

#### Filament

Voltage 5.0 v.

Current 6.5 a.

#### Screen Grid Rating

Voltage (max) 600 v.

Diss. (max) 20 w.

#### Plate Rating

Voltage (max) 3000 v.

Current (max) 225 ma.

Diss. (max) 125 w.



## PL-6569

### Triode

### Grounded-Grid Type

#### Filament

Voltage 5.0 v.

Current 14.5 a.

#### Plate Rating

Voltage (max) 4000 v.

Current (max) 300 ma.

Diss. (max) 250 w.



## PL-5D22

### Beam Tetrode

#### Filament

Voltage 5.0 v.

Current 14.5 a.

#### Screen Grid Rating

Voltage (max) 600 v.

Diss. (max) 35 w.

#### Plate Rating

Voltage (max) 4000 v.

Current (max) 350 ma.

Diss. (max) 250 w.

Technical data sheets giving ratings and typical operating conditions are available. Ask for data file 701.



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held a banquet and auction night. Cayman Island Night was held at the Hamilton ARC when CJ took the gang on a travel to that paradise of the West Indies and told about his third trip. He operated under the call VE5BP to give many a new country. As one who heard Noel, I extend thanks for such an evening. Traffic: VE3BUR 191, AJR 163, NC 93, VZ 93, DPO 90, ATU 30, KM 27, NO 24, AOE 10, AVS 7, VD 6, PH 5, TO 5.

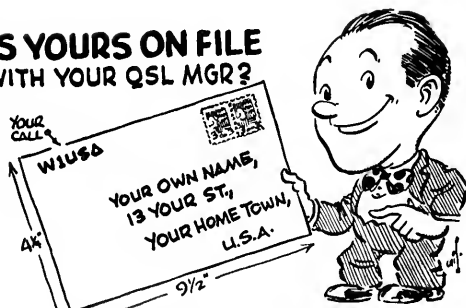
ALBERTA — SCM, Sydney T. Jones, VE6MJ — PAM: OD, RM: XG, WC says he is getting TVI troubles like 1. AL is operating 'phone on 3.8 Mc. PS has qualified for 'phone operation. OC is back on the air from the new Edmonton QTH. ZR is QRL with new mobile installation. NX and MJ both are chasing the elusive DX. EP is building a new receiver. YE is QRL with plans for his daughter's marriage. The code practice sessions heard on 3768 kc. during the past months will be suspended during the summer months but will be resumed in the fall. JP is working on an oscilloscope for modulation purposes. Traffic: VE6HM 88, AL 21, WC 12, MJ 4.

BRITISH COLUMBIA — SCM, Peter M. McIntyre, VE7JT — SEC: DH. Summer being well on the way everybody will be doing all the usual summer antenna repairs, and dodging the ever-present household chores. Barring the few traffic reports this month there is not much to report. The mobile activity is picking up now that the good weather is here with hidden transmitter hunts and mobile pioni in the offing. The last hidden transmitter hunt of May 1st was taped and should have been heard on the CBC Roving Reporter series on the local Vancouver CBC station, CBU. Last month's column, I hope, will bring some things to report next month. Keep your ears open for 7JB, whose aim has been to start a swap and shop gimmick for the amateurs at a convenient location. It should prove very beneficial for the amateurs to trade or swap for the stuff they need with what they have that someone else wants. Also every Wed. night on the AREC Net on 3755 kc. is the swap column night. There is a list of phonetics printed in the *Handbook*. It would save a lot of the net's time if the stations would use phonetics, especially when making relays. Give it a try! Traffic: VE7QC 208, ASR 105, AQW 44, AUF 32, AIO 16, ZV 14, ZF 9.

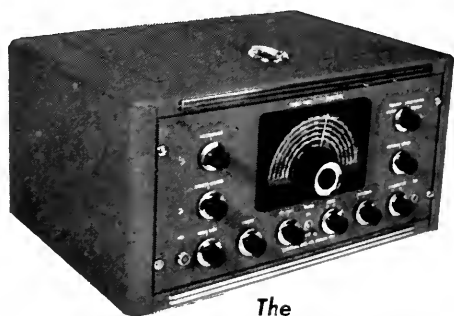
MANITOBA — SCM, John Polmark, VE4HL — OO: RB, LO, now tractor mobile, hasn't quite licked the noise yet. EF finally has gotten his 20-meter beam working. KG is going to have a try at mobile. The AREC is off to a fine start. How about some more applications? GV has his rig working again. Glad to see you back, Jimmy. VE3DVF/M4, ex-4AX, was back for a short visit with his FB mobile. AY is back after having transmitter troubles. Congratulations to NX on getting his commercial flying ticket. NW finally is getting moved to the lake. How about a few activity reports? Traffic: VE4AI 28, KL 12, HL 10, YR 10, KG 9, EF 7, FF 6, XP 4, GB 2, OB 2.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — This report is being made up at the hospital, my QTH for the past two months. I would like to say thanks to all the gang for the kind wishes that have been received, both via 75 meters and by card. Through the courtesy of TH I have an S-38 and it has given me many pleasant hours listening in on the bands. BD is on 28-Mc. mobile 'phone. BZ is going to 14 Mc. for the summer. FG is QSY Moose Jaw. When two local public schools held Hobby Shows, BG and HR set their stations up. A number of contacts were made and the display was well received by the public as well as the school children. JO has been promoted with the Power Corporation and is now located at Regina Beach. We regret to record the passing of SD on Apr. 13th. He will be greatly missed by the Prince Albert Club. DR made BPL with his traffic handled during the big blow. 5AJ and 6AL were instrumental in locating an overdue aircraft en route to Saskatoon during the big storm. Traffic: VE5DR 177, YF 33, RE 26.

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SEE PAGE 64 FOR A COMPLETE  
LIST OF A.R.R.L. QSL MANAGERS



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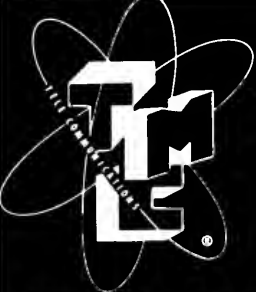
- ▶ Panel,  $\frac{1}{8}$ " steel relay rack type. Beautiful Concord Blue finish
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## S.S.B. VFO

(Continued from page 12)

hold the loop thus formed. The tap should be tinned before the coil is mounted, to facilitate connecting the lead from  $C_4$ .  $L_5$  is wound in a straightforward manner, terminating on the split-ring terminals provided with the LS-3 coil form.  $C_{10}$  is connected across the coil to these same rings. After winding, both coils should be coated with coil "dope."  $L_2$ ,  $L_3$ , and  $L_4$  are pre-wound coils and can be adjusted to resonate to the required frequencies with tube and circuit capacitances.

Most wiring can be completed point to point, except the B-plus, which is terminated on tie points. In the Central Electronics exciter the 6.3-volt filament supply has its center tap grounded, necessitating a two-wire filament circuit. The wiring to the oscillator section was run in the fold of the chassis and didn't have to go through the shield since there was sufficient room for these leads between the shield and the chassis. However, the wires could be fed through a 1/4-inch rubber grommet if necessary.

The interconnecting cable is made up of 3 ordinary leads and a piece of coax for the r.f. The plugs on each end, and their connections, will be determined by the type of socket on the exciter (octal on the 10-A) and  $J_1$ . The cable was taped with Scotch electrical tape for neatness.

### Adjustment

First, check all wiring and determine that no errors exist. Then connect the cable between the exciter and the VFO. Turn on the exciter and determine that both tube filaments light. Do this with the VR tube out of its socket as the jumper in the tube will open the B-plus to the tubes. Remove both tubes from their sockets, replace the 0B2 and adjust the dropping resistor for 23 to 25 ma. of current through the VR tube. Next, insert the oscillator tube,  $V_1$ , and listen around 5 Mc. in the receiver for the oscillation. It would be wise to connect a low-range milliammeter between the cathode choke and ground. It should indicate approximately 10 ma. Peak the signal with the slug in  $L_2$ .

Now comes the important part, to determine the range of the oscillator from maximum to minimum capacity. It will be more than the required 500 kc. Set the 5-Mc. point at 5 on the logging scale, by adjusting the slug in  $L_1$ . Now carefully remove one plate at a time from  $C_1$ , readjusting  $L_1$  as necessary. As each plate is removed, record the new range of the oscillator on a piece of paper. As you progress, a pattern will emerge of the ratio of change as each plate is removed. When the 500-ke. range occupies *almost* all of the scale, the pattern will warn you that to take off *one* plate more will be one too many. This procedure determines the bandwidth of the VFO. The writer's VFO covers the 500 kc. needed between 5 and 93 on the logging scale of the MCN dial.

Next, plug in the buffer/multiplier tube, set

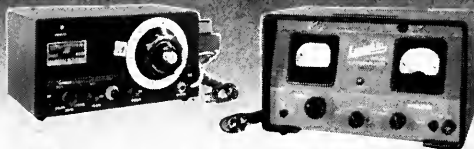
(Continued on page 118)

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the bandswitch in the 80-20 position, and with the dial near midscale peak the slug in  $L_4$ . There should be some increase in signal strength in the receiver as the gain of the buffer stage is added. Next, set the bandswitch to the 160-meter position and listen for the signal around 10.9 Mc. Peak  $L_3$  for maximum signal. The VFO dial will have to be moved toward the 5.5-Mc. end. Next, set the dial near the 5.4-Mc. point and the bandswitch to the 40-meter position, and look for the signal around 16.2 Mc. on the receiver. Now peak  $L_5$ . For accurate placement of the 5.0-Mc. point (about 5 on the logging scale) zero-beat the oscillator with the 5-Mc. signal of WWV and adjust the slug in  $L_1$ . This completes the adjustment, but after attaching the cover (bottom plate) with sheet metal screws, recheck all the above adjustments, touching up the slugs where needed.

The oscillator adjustment procedure can also be used to adjust the bandset dial on two-dial receivers. With the 10-A in "Cal," set the bandspread dial on the receiver to 4.0 Mc., then carefully tune the bandset dial until the signal is heard zero beat. The receiver is then calibrated for the 75-meter band at 4.0 Mc. (provided the 9-Mc. crystal in the exciter actually is on exactly 9 Mc.).

Your VFO is now ready to give you s.s.b. operation on four bands.

## Receiver Modifications

(Continued from page 27)

### Appendix II

Revision of 75A-3 to use 6DC6 or 6BZ6 as r.f. amplifier. All resistor tolerances  $\pm 10$  per cent unless otherwise marked.

For sets serial number 1299 and under using the 455B series of mechanical filter:

- 1) Replace 6CB6 with 6DC6 ( $V_1$ ).
- 2) Remove  $R_{66}$  (120 ohms) and  $C_{106}$  (cathode by-pass), tie Pins 2 and 7 of r.f. amplifier to chassis.
- 3) Remove  $R_{65}$  (1.5 megohm). (Some sets may use 1 megohm.)
- 4) Change  $R_7$  ( $V_2$  cathode) from 68 ohms  $\frac{1}{2}$  watt to 180 ohms  $\frac{1}{2}$  watt.
- 5) Check to see that Pins 2 and 7 of  $V_1$  are connected to chassis. If not, connect them. (This modification has been made on sets with serial numbers higher than 950.)
- 6) Remove a.v.c. from Pin 3 of mechanical filter box assembly. Connect Pin 3 of filter box to junction of  $R_{57}$ ,  $R_{58}$  (r.f. gain control and minimum bias resistor).
- 7) Add  $R_{84}$  (100 ohms,  $\frac{1}{2}$  watt) between  $R_{50}$  and Pin 7 of  $V_7$ . Move junction of  $R_{67}$  and negative side of meter to opposite side of  $R_{50}$ .
- 8) Change  $R_{67}$  (meter shunt) to 220 ohms,  $\frac{1}{2}$  watt  $\pm 5$  per cent.
- 9) Change  $R_{47}$  to 220 ohms,  $\frac{1}{2}$  watt  $\pm 5$  per cent.
- 10) Change  $R_{50}$  to 56 ohms,  $\frac{1}{2}$  watt  $\pm 10$  per cent.

For sets serial number 1300 and over using 455C filter:

- 1) Replace 6CB6 with 6DC6 ( $V_1$ ).
- 2) Remove  $R_{66}$  (120 ohms) and  $C_{106}$  (cathode by-pass), tie Pins 2 and 7 of r.f. amplifier to chassis.
- 3) Remove  $R_{65}$  (1.5 megohms).
- 4) Change  $R_7$  ( $V_2$  cathode) from 68 ohms  $\frac{1}{2}$  watt to 180 ohms,  $\frac{1}{2}$  watt.

(Continued on page 120)

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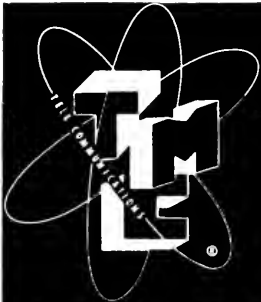
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5) Change  $R_{81}$  from 4700 ohms,  $\frac{1}{2}$  watt to 10,000 ohms,  $\frac{1}{2}$  watt.

6) Change  $R_{67}$  to 150 ohms,  $\frac{1}{2}$  watt (S-meter shunt).

7) Remove a.v.c. from Pin 3 of mechanical filter box assembly. Connect Pin 3 of filter box to junction of  $R_{57}$ ,  $R_{58}$  (r.f. gain control and minimum bias resistor).

### Appendix III

Conversion of 75A-2 to replace 6BE6 mixers with 6BA7s.

1) Carefully unsolder pin connections of  $V_2$  and  $V_4$ .

2) Remove 7-pin tube sockets and ream out holes to  $\frac{3}{4}$  inch for clearance of 9-pin sockets. Be sure that all loose chips are removed from set, especially around bandswitches.

3) Mount new tube sockets. Orient  $V_2$  socket so that Pin 7 is closest to r.f. amplifier. Orient  $V_4$  socket so that Pin 2 is closest to crystal oscillator tube,  $V_3$ .

4) Wire sockets per schematics in Fig. 4, being sure that all grid and plate leads are as short as possible and that all chassis connections are returned to the same point they were made to in the original set-up.

### Appendix IV

Revision to improve shape of i.f. selectivity curve.

1) Remove  $C_{110}$  (top coupling for  $T_6$  — not present in all models).

2) Add 82,000-ohm  $\frac{1}{2}$ -watt resistor across terminals A and C of  $T_6$  ( $R_{83}$ ).

3) Realign 455-ke. i.f. using the following procedure:

a) Connect v.t.v.m. d.c. lead to diode load (junction of  $R_{39}$  and  $R_{42}$ ).

b) Connect signal generator output to receiver antenna terminals. Set signal generator to some frequency in the 80-meter band. Do not move signal generator frequency during the rest of the 455-ke. i.f. alignment procedure.

c) Tune receiver to signal frequency.

d) Adjust signal generator output control for an S-meter reading of S9 + 20 db.

e) Tune receiver to the S9 point on the high-frequency side of the signal. Record the dial reading.

f) Tune receiver to the S9 point on the low-frequency side of the dial. Record the reading.

g) Set the dial halfway between the readings determined in steps (e) and (f).

h) Set the fiducial (zero set) accurately to some dial division. During the following adjustments, attenuate the signal generator output to keep the v.t.v.m. readings below 5 volts.

i) Tune dial 3 kc. lower than the center frequency (determined in step (g)). Adjust  $T_6$  (both top and bottom slugs) for maximum v.t.v.m. readings.

j) Tune the dial 3 kc. above center frequency. Adjust  $T_3$  and top and bottom slugs of  $T_7$  for maximum v.t.v.m. reading.

k) Retune to center frequency determined in step (g) and tune  $C_{32}$  (plate of  $V_{18}$ ) for maximum readings.

### Appendix V

Revision to improve a.v.c. noise immunity.

1) Replace  $C_{52}$  with .05- $\mu$ fd. 300-volt capacitor (grid-plate coupling at V9).

2) Replace  $R_{35}$  with 0.33-megohm + 10 percent,  $\frac{1}{2}$ -watt resistor (grid-plate coupling at V9).

3) Replace  $C_{51}$  with 0.2- $\mu$ fd. 200-volt capacitor (grid shunt at V9).

4) Add 180- $\mu$ fd. mica or ceramic capacitor from Pin 2 of V9 to chassis.

5) Remove  $C_{98}$  (on a a.v.c. line).

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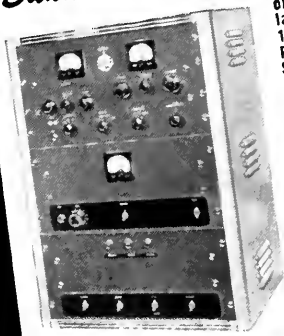
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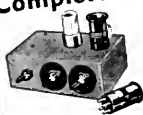
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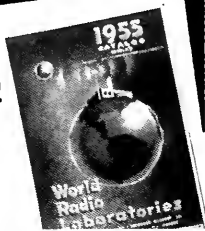
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## Break-In Keying

(Continued from page 28)

If the action just described is not obtained, you probably have the rectifiers connected backwards, and they should be reversed. It should be apparent, of course, that the same principle can be applied to a transmitter currently using grid-block keying, since the pertinent parts of the keyed circuit are similar. A vacuum tube diode can be used in place of the selenium rectifier, but it must be shunted by a high resistance to simulate the back resistance.

I have been using this system for two years and have no reason to ask for more. The keying is clean because the characters are being formed in the next to the last stage of the transmitter, and no back wave is heard with the key open and the receiver set at above normal gain.

## Six Meters

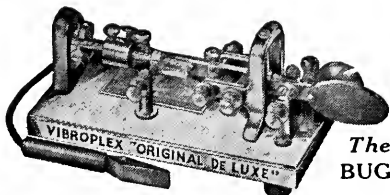
(Continued from page 32)

Such a coupler or balun can be connected anywhere: at the transmitter, at any convenient point between the rig and antenna, or at the antenna itself.

An antenna system that is designed for 300-ohm Twin-Lead feed, such as the 4-element array described in all the *Handbooks*, can be fed with coax and either of the coupling devices shown in Fig. 2. The coupling circuit of Fig. 2A can be used with either 50- or 75-ohm coax, and the line can be any balanced transmission line presently available. The components of the coupler can be similar to those used in the plate and output-coupling circuits of the final stage.

Adjustment of the coupler and the antenna system can be done positively only if a standing-wave indicator of some sort is inserted in the coaxial line. Adjustments should be made for minimum standing-wave ratio first, and then the coupling at the transmitter should be set for the desired loading. A low s.w.r. is particularly important if coaxial line is used all the way to the antenna system. The design and use of s.w.r. bridges are covered in all recent *Handbooks*.

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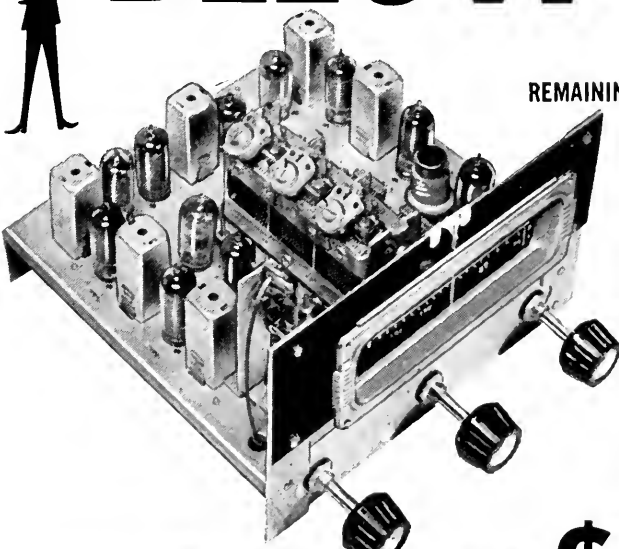
## Strays

Bob Barry of Santa Barbara, a rabid Democrat and an Adlai Stevenson tub-thumper, got his come-uppance from FCC when they issued him his ticket: KN6IKE! — K6ATX

If you have trouble getting the Globar (Carborundum Co., not GE) type CX resistor called for in "The Z-Match Antenna Coupler" which appeared in *QST* for May, 1955, you can get one for \$4.90 prepaid from Harvey-Wells Electronics, Inc., Southbridge, Mass.

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Approved for G. I. training

## What's the Answer?

(Continued from page 35)

frequency, expressed in kilocycles or megacycles. In the early days of radio, amateur bands were listed by meters. In the interest of accuracy, the "powers-that-be" switched to frequency designations for the radio spectrum. However, habits die hard, and although the change was made in the late '20s, it is still common practice to use meters as band designations.

If one wishes to convert frequency-in-kilocycles into wavelength-in-meters, and incidentally, this is a question sometimes asked in the Novice exam, the following formula is used:

$$\lambda = \frac{300,000}{f}$$

where  $\lambda$  = Wavelength in meters  
 $f$  = Frequency in kilocycles

Example: The wavelength corresponding to a frequency of 3500 kilocycles is

$$\lambda = \frac{300,000}{3500} = 85.7 \text{ meters.}$$

## Lightning Protection

(Continued from page 37)

antenna was cut to center on this frequency. Operation is not confined to this frequency, however, as many contacts are made even at the high end of the band without any retuning or adjustment of either the driver or final-stage tuning circuits.

The antenna is 125 feet long and the quarter-wave Zepp feeders are 62½ feet long, spaced 6 inches apart. The feeders are tied together at the lower end and grounded. A metal rod 6 inches long is used as the lowest spacer. RG-11/U (72-ohm) coax is used to feed the Zepp feeders. The shield of the coax is attached to the feeder which goes to the antenna and the center conductor goes to the other feeder which dead ends at the antenna. The point of attachment is about 24 inches from the shorting bar. The coax is tied to the feeder to which the shield is connected and follows it back to the shorting bar and then follows the ground lead to the ground stake and from there runs underground to the house.

By now you are wondering why the shield is connected to the feeder which goes to the antenna instead of being attached to the feeder which dead ends. Actually, it makes no difference which way you do it, except that if you use a bridge to check the standing-wave ratio, you will have more trouble with induced voltages from local broadcast stations if you reverse the connection, since the feeder plus antenna picks up much more of this broadcast field voltage than the dead-ended feeder alone will pick up.

Another benefit from this antenna which was entirely unexpected is the reduction in harmonics reaching the antenna. At the desired frequency, the 4 feet of wire between the ends of the coax and the shorting bar serve as a transformer to

(Continued on page 126)

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Approximate Dimensions & Weight : Megaphone 20" long, diameter 13 1/2".

Amplifier dimensions—in 2-piece Portable Metal Case, housing 6 volt storage battery—13 3/4" H, 12 3/4" W, 9 3/4" deep.

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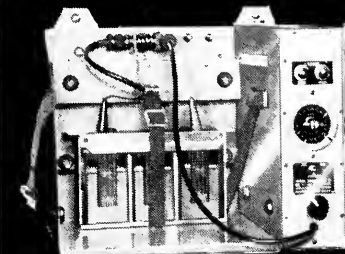


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match the impedance of the coax to the impedance of the open-wire feeders. At other frequencies, however, this is not the case, and the higher-order harmonics are effectively suppressed. No other filter is used at W4ZG for this purpose and there is no observable interference on a television receiver connected to an antenna just 15 feet away from the Zepp feeders.

Should you wish to use this antenna on other bands, you may do so by reducing the dimensions in accordance with standard antenna formulas. The point of connection of the coax to the Zepp feeders is not critical and may vary somewhat under different surrounding conditions. It can best be done by measuring the s.w.r. at the transmitter end of the coax at several different test positions, but if no bridge is available, the connection of the coax to the Zepp feeders may be made 24 inches from the shorting bar for 80 meters, 12 inches for 40 meters, 6 inches for 20 meters, and 3 inches for 10 meters.<sup>1</sup> It is desirable that the feeder spacing be reduced at the higher frequencies as the length of the shorting bar is a factor in the impedance match.

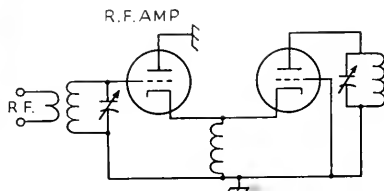
<sup>1</sup> For antenna systems in which the antenna and feeder lengths are the same as above in terms of wavelength. — En.

## Technical Correspondence

(Continued from page 48)

minimizing the noise figure of the second stage. To calculate the noise figure of this combination we need to calculate the noise contributions of the two tubes, and if for simplicity we assume the two noise figures are identical, the noise figure of the combination can be shown to differ little from that of the first circuit.<sup>1</sup>

If the tap on the interstage coupling coil is left out this circuit becomes the so-called "cathode-coupled amplifier" shown below:



The noise figure of this combination is slightly poorer. Since the two triodes here are directly connected through their common cathodes, a valve often used in this circuit is a Type 6J6 (whose equivalent noise resistance is 470 ohms for each triode section). This circuit is identical to that used by Longerich and Smith, except that a.c. coupling is employed rather than direct coupling and the series-resonated coil in the cathode is replaced by a resistor. The noise figure of the cathode-coupled amplifier is in general somewhat better than the grounded-cathode pentode amplifier. This circuit is, however, inferior to the grounded-cathode grounded-grid triode circuit in both noise figure and stability (i.e., the so-called Wallman circuit<sup>2</sup> or cascode r.f. amplifier<sup>3</sup>). Also, the lower available power gain of the grounded-plate triode means that contributions of third-stage noise are correspondingly greater.

— Jack Belrose, ex-VE7QH-VE3BLW

<sup>1</sup> Valley and Wallman, *Vacuum Tube Amplifiers*, p. 664 (McGraw Hill M.I.T. Radiation Laboratory Series).

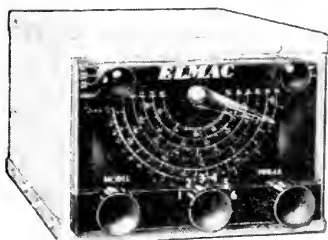
<sup>2</sup> Shimizu, "Modified Wallman Circuit with Voltage Feedback," *Electronics for Communication Engineers*, p. 28 (McGraw Hill, 1952).

<sup>3</sup> *The Radio Amateur's Handbook*, p. 366 (1954).



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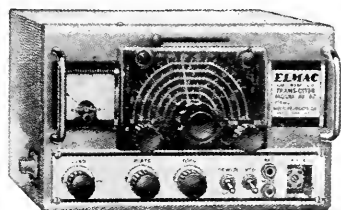
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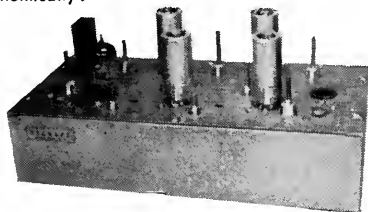
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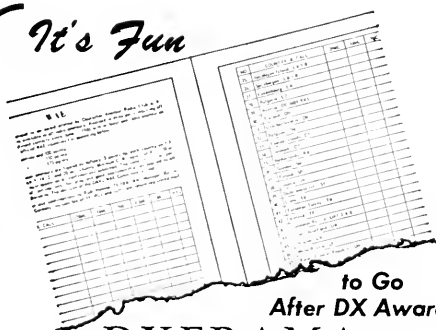
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## Happenings

(Continued from page 44)

64) On motion of Mr. Gowan, VOTED that the President appoint a Membership & Publications Committee for the purpose of reporting to the Board at its next meeting recommendations for increasing membership and interest in ARRL among Novices and beginning amateurs. The Committee is requested to consider, among other things, the feasibility of the establishment of a "Student Grade" membership and the publication of a Novice Handbook.

65) At this point, the President announced the following are appointed to the Membership & Publications Committee for the following year: Mr. Maer, Chairman, Mr. Gowan and Mr. Steed.

66) At this point, without formal action, the Board and its General Counsel, at the request of Mr. Cornell, engaged in an extensive discussion of Article 12 of the Articles of Association.

67) On motion of Mr. Roberts, the following resolution was unanimously ADOPTED:

WHEREAS, Karl W. Weingarten, W7BG, had for nearly twenty years served The American Radio Relay League and amateur radio as Director and Vice Director of the Northwestern Division, and

WHEREAS, the institution of amateur radio is deeply grieved by his passing on December 2, 1954

Now, therefore, BE IT RESOLVED, that the Board of Directors of The American Radio Relay League, meeting at Hartford, Connecticut on May 14, 1955, on behalf of amateur radio hereby expresses its deep sense of loss at his passing.

68) On motion of Mr. Maer (on behalf of Mr. Cornell), unanimously VOTED that the Board of Directors of the League authorizes a National Convention to be held in the Pacific Division of the League during the year 1956, under terms as may be approved by the Executive Committee upon receipt of a satisfactory request from a responsible group to sponsor such a convention.

69) On motion of Mr. Maer, unanimously VOTED, that the General Manager is hereby authorized to pay expenses for the operation of the Membership & Publications Committee during the year 1955 in an amount not to exceed \$1000.

70) Whereupon, on motion of Mr. Schmidt, the Board adjourned *sine die* at 10:46 A.M.

71) (Time in session as a Board, 9 hours, 54 minutes; total authorizations \$28,150.)

A. L. BUDLONG  
Q. B. SMITH  
Secretaries

## Hints & Snarls

(Continued from page 45)

ingly working right below. Once I almost had the best beam of anybody in the graveyard.

4) Lay the ladder down gently, Stupid. Don't bounce it off your big toe as I always do.

5) Don't service an antenna, accompanied by 8000 angry bees, without wearing the baby's crib netting over your head. *Caution:* Tuck it in. *Second caution:* If you have a big nose forget the whole beezness.

## Measurements

1) The arc off the final "test." A certain Long Island W2, who should have known better, popped a pretty good bottle that way. Now he's QRP.

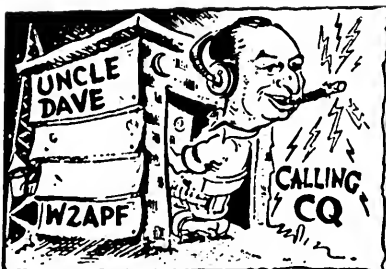
2) The "voltage measurement test," also known as the "grabbed it" test. Not accurate, but rather shocking. Use your own calibration system.

3) The "wonder if it's turned on" test. You too?

4) The "whoops, shorted it" test.

5) The "burned finger" test. Quite handy in finding out which tube is cold. It's always the last one.

(Continued on page 130)



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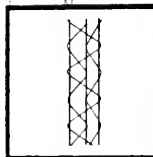
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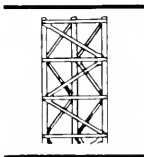


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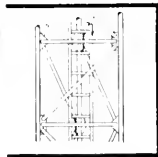
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Finished in reddish-brown fabrikoid with stiff covers, each Binder holds twelve issues of QST, opens to any page and lies flat. Your copies are protected and always available for easy reference.

Each — \$3.00

(Postpaid)

**American  
Radio Relay League**  
West Hartford 7, Connecticut

## Expense Accounting

- 1) The amazing surplus prices for brand-new gear (to impress the XYL but not your banker).
- 2) The "leave it in the car and sneak it in after dark" technique.



THE "LEAVE IT IN THE CAR AND SNEAK IT IN AFTER DARK" TECHNIQUE

## Frustration in General

1) Never live on the East Coast. You get all the blackouts and magnetic storms. When it gets so bad back East that you can't even give your neighbor his accustomed TVI, the West Coast goes merrily on its happy DXing way. (Known as East Coast ulcers.)

2) Even though the postman is the ham's best friend, the inflated foreign postal rates will really get you. It's no longer "Will you send me a card?" but "Can you afford it?". Just one more hazard on top of "Sorry you ain't in my log," wrong call on QSL card, essential contact info missing, etc.

3) Incidentally, once the other guy gets your call wrong, you can do a jig, stand on your head, etc., while he says "solid copy R R wrong call R R." Why not a Q signal for "Listen carefully, dumbbell, my call is —"? Do you go off talking to yourself, too?

4) *Never, never, never* put up a brand-new 3-element beam just ahead of those three witches — Carol, Edna and Hazel. We ain't had a hurricane around here for nigh onto 10 years. So GVZ belatedly goes modern again. (This is one case where outdoor plumbing is best.) And what happens? Bam, zowie, whee — Hellion Hazel turned my hair black again, what with watching what looked like my beam's death agonies. My hair even stood up on end, quite a trick considering that the baldies wore it all off years ago. Just when I was mentally framing an epitaph which said "Born in June, died in October," Hazel went away and bothered someone else. A big apple tree fell on the house, we had no power for three days, the food in the freezer went defunct, but who cared? The beam survived undamaged!

Guess I don't need that new book after all. For once I must have done it right!!!

## Strays

W4EUV wonders if there is any paint or coating that would keep woodpeckers from slowly disintegrating his beam pole!

— . . . —

K6BF, B. J. Kroger of Santa Barbara, Calif., who has kept a 100 per cent log for over thirty years, recently had his 20,000th QSO on 2 meters with K6HEC, Oxnard. Kroger has had 11 calls in four U S. districts, Nicaragua and Mexico.



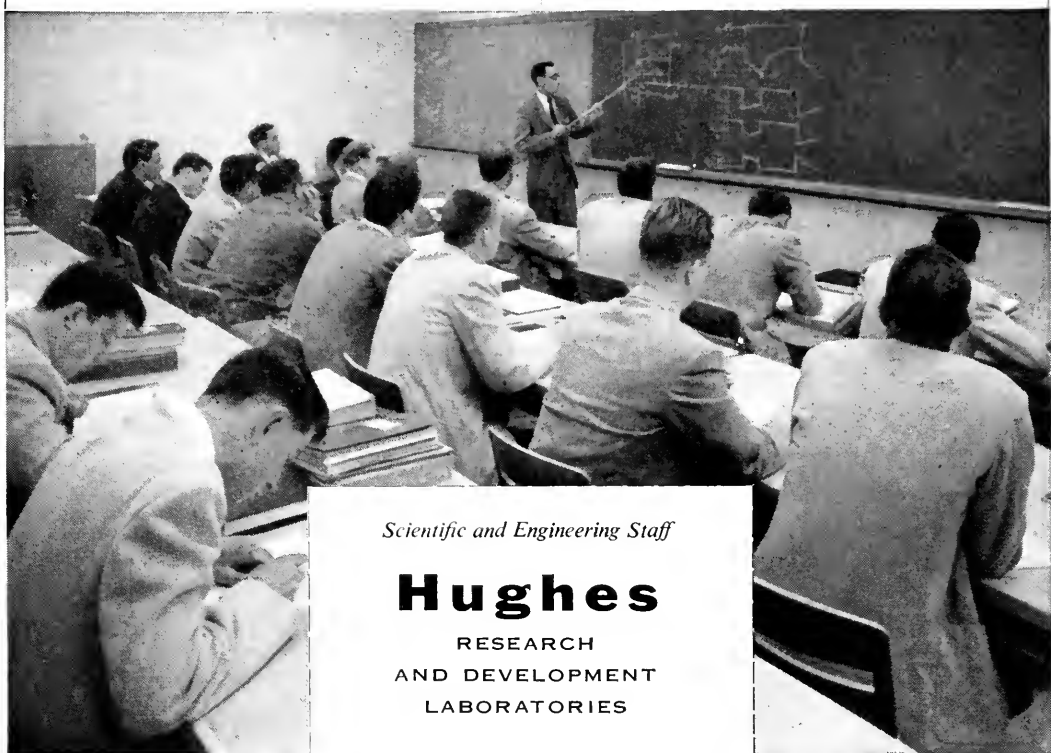
# Apply Your Electronics Experience

ENGINEERS AND  
PHYSICISTS WITH  
ELECTRONICS TRAINING  
ARE NEEDED TO  
CONDUCT CLASSROOM  
AND LABORATORY  
PROGRAMS ON ADVANCED  
SYSTEMS WORK IN THE  
FIELDS OF RADAR  
FIRE CONTROL.  
ELECTRONIC COMPUTERS,  
GUIDED MISSILES.

*The proper functioning of the complex airborne radar and computer equipment produced by Hughes requires well-trained maintenance crews in the field.*

At Hughes Research and Development Laboratories in Southern California engineers assigned to this program are members of the Technical Staff. As training engineers they instruct in equipment maintenance and operation for both military personnel and field engineers.

*Prior to assignment, engineers participate in a technical training program to become familiar with latest Hughes equipment. After-hours graduate courses under Company sponsorship are available at nearby universities.*



*Scientific and Engineering Staff*

## **Hughes**

RESEARCH  
AND DEVELOPMENT  
LABORATORIES

*Culver City, Los Angeles County, California*

**In this top rated rig  
TVI is sealed in with  
METEX Electronic Weatherstrip**



Viking Ranger

This inexpensive product will do the same for your own rigs. Follow the lead of Johnson and other high placed manufacturers.

For sealing your own rigs or any consumer, industrial or military equipment against RF leakage METEX Electronic Weatherstrip is highly effective and is a simple operation. It's made of highly resilient compressed knitted wire which comes in several forms to meet all normal requirements even where closure is of an uneven nature. Type TVI 20-S is easily applied to most rigs in the home workshop.

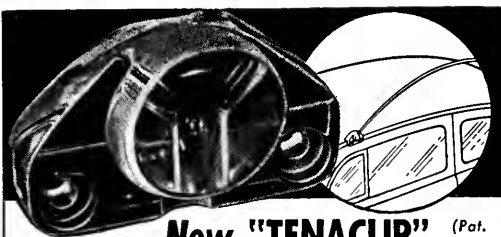
METEX Electronic Weatherstrip is the simplest and most inexpensive method for sealing in RF leakage yet devised. Try it. Results are amazing. Ham and industrial inquiries invited.



**METAL TEXTILE CORPORATION**

KNITTERS OF WIRE MESH FOR MORE THAN A QUARTER CENTURY

Roselle, New Jersey



**New "TENACLIP" (Pat. Pend.)**

**attaches to car... stops antenna whipping**

Clear plastic clip quickly fastens to rain molding... holds right or left antennas. Prevents damage to antenna from low hanging limbs or driving into garage. See your dealer or order direct. No C.O.D.'s please.

PLASTICLES, 4207 GRAND RIVER, DETROIT 8, MICH.

**\$1.98**

postpaid



# GPR 90

**TECHNICAL MATERIEL CORPORATION**  
Mamaroneck, N. Y.

**World Above 50 Mc.**

(Continued from page 67)

open end, with coupling loops for injection and input. The line is tapped for a crystal-diode mixer. Item 4 is a wave-meter tuning from 300 to 1300 Mc., by W6RJS. Near it is a 1296-Mc. tripler (5) similar to one soon to appear in *QST*. It was built by W6DQJ, and it uses a 2C39A tube, which may be seen on the floor in front of it.

A converter for 1215 Mc. shown at (6) uses the r.f. assembly from an AN/TRC-5. It has two resonant circuits preceding the crystal mixer. Its local oscillator uses a 2C40. One stage of 30-Mc. i.f. amplification is included. It is the property of W6DQJ. The APS-13 (7) is useful as an i.f. system for u.h.f. or microwave work. W6DQJ uses its 30-Mc. i.f. with the converter described above.

In his other hand Don holds a complete transmitter and receiver for 1215 Mc. A local oscillator from a TPS-1 serves as a transmitter, its type 446A tube delivering about ½ watt. The receiver section has another 446 local oscillator feeding a crystal mixer. A cascode i.f. stage on 30 Mc. is link coupled to a TV i.f. strip modified for 6AK5 tubes. A single audio section is used for both receiver output and Heising modulator. The power supply for this station is shown between items (3) and (5).

At the right of the photograph is an APT-5, property of W6RJS. This jammer, a common item in the heyday of low-priced surplus gear, has a relatively high-powered oscillator tuning from about 300 to above 1200 Mc.

Demonstration of the gear included two-way communication by W6CFL and W6MMU, and considerable interest was generated that should provide company for W6CFL, W6DQJ, and W6NLZ, u.h.f. pioneers of the Los Angeles area.

**OES Notes**

**K2GAN, Murray Hill, N. J.** — Constructed chassis with 5 different overtone oscillator circuits, to permit comparisons that will determine their respective merits for use in 2-meter transmitters and converters. Also experimenting with crystal grinding.

**K2DYC, Phelps, N. Y.** — 50-Mc. transmitter similar to October, 1954, *QST*, about completed.

**W2ORA, Collingswood, N. J.** — Activity on 50 Mc. picking up steadily in the Philadelphia-to-Washington area, but little heard from the north. Will cooperate with interested 50-Mc. operators in early-morning schedules, beginning at 6:30 EDT. Should be attractive to those who are kept from operating in evening hours because of the threat of Channel 2 TVI.

Recently put in 50-Mc. crystal. This may be TVI solution for some who think Channel 2 TVI is impossible to correct. Much trouble may come from unwanted harmonics of 6- or 8-Mc. crystals falling in Channel 2, rather than from blocking by the 50-Mc. fundamental.

**W2UXP, Webster, N. Y.** — Several new stations expected soon on 50 and 220 Mc.

**W3PMG, Chinchilla, Pa.** — Small transmitter-receiver set-ups for 50, 144, 220 and 420 Mc. under construction for use by W3KX/3 in V.H.F. Party and Field Day.

**W3UQJ, York, Pa.** — New 2E26 rig running on 50.3 Mc. with 3-element array. Will soon have 829-B final. Skeds being run with W3OTC, Silver Spring, Md., on 6. Activity growing on 50 Mc., new stations including W3s OWW OCI ALN AXC and SST.

**W4HHK, Collierville, Tenn.** — Monitoring 50.1 Mc. daily with fix-tuned receiver. Six-meter rig with p.p. 6146s under construction. Also planning 220-Mc. exciter for 4X150 220-420 final already on hand. Double conversion with single crystal planned for 432-Mc. reception. Crystal on 42.5 Mc. is to be multiplied 9 times for injection at 382.5 Mc., converting the 432-436-Mc. range to 39.5 to 53.5 Mc. The 42.5-Mc. signal also beats with the latter range in a second mixer to produce an i.f. of 7 to 11 Mc. to be tuned on the HRO.

**W4KKK, Rome, Ga.** — Experimenting with 50-Mc. phase modulation, in attempt to reduce TVI in fringe-area reception of Channel 2 from Atlanta. Most of the TVI was of an audio nature with the a.m. rig, picture being unaffected except in immediate vicinity. Working W4AKX, Gadsden, Ala., on Six, 55 miles.

**W4UIW, Miami, Fla.** — Active stations on 144 Mc. include W4s RNV KQG UIW FLH and JZB, with more activity coming. [See report of reception of Miami area

(Continued on page 134)

# Just released...

## and they're waiting for you at Burghardt's

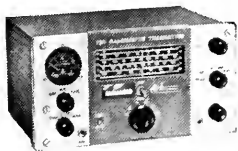
**Terrific Trade-Ins**—As liberal as anyone in the country ... and yours may be worth more at Burghardt's. Trade-ins usually cover down payment on your new gear.

**10% Down—Easy Terms**—10% down lets you "take it away." Up to 18 months to pay on balances over \$200. Burghardt's financing saves you money—adjusts terms to your budget. All time payments based on local bank rates. Full payment within 90 days cancels interest.

**Speedy Delivery—Personal Attention**—No order too large or small for personal attention. All inquiries acknowledged and orders processed day received.



**Satisfaction Guaranteed**  
or your money refunded  
after 10 day trial.



**HARVEY WELLS T-90 SUPER BANDMASTER**—Here, in one small package (only 12 $\frac{3}{8}$ " x 10 $\frac{1}{2}$ " x 6 $\frac{3}{4}$ ") is a complete 90 watt, band-switching transmitter for fixed or mobile operation • TVI suppressed • complete break-in keying or keying of just exciter stages • push-to-talk and receiver muting • antenna changeover relay • 90 watts CW • 75 watts phone. Factory assembled and tested, complete with tubes.  
**ONLY \$17.95 DOWN**  
**\$9.78 per month for 18 months.**

**ACPOWER SUPPLY FOR THE T-90**—Designed specifically for use with the T-90 for fixed station operation. Operates with nominal line voltage input of 115 AC, 60 cycle, single phase. May be used as a separate supply for other equipment. Filament and relay voltages may be dropped to 6.3 volts with external resistors.  
**ONLY \$7.95 DOWN**  
**\$6.32 per month for 12 months.**

**HARVEY WELLS R-9 RECEIVER**—The perfect companion unit to the T-90, this highly stable, all-band receiver has a number of features never offered in such a compact rig before. Double conversion on all bands • all coils slug tuned, providing high "Q" circuits • separate oscillator coils for each band. Complete with tubes and built-in AC power supply.  
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**\$8.14 per month for 18 months.**

**VIBRATOR POWER SUPPLY FOR THE R-9**—Designed to power the R-9 receiver for mobile operation, the VPS-R9 will operate with either 6 or 12 volts DC. Complete with shielded cable and connector.  
**ONLY \$28.50 COMPLETE**



**HAMMARLUND PRO-310 RECEIVER**—New from top to bottom, the Pro-310 features outstanding advancements in circuitry and mechanical design. Covers 550 kc to 35.52 mc • exceptional stability • high image rejection on all 6 bands • double conversion on top 4 • exalted BFO and sharp selectivity built-in for SSB operation. Bandspeed continuously calibrated over the entire range.  
**ONLY \$59.50 DOWN**  
**\$24.99 per month for 24 months.**  
Matching speaker available soon

**HAMMARLUND HQ-140-X RECEIVER**—A top quality communications receiver for the commercial or amateur radio operator, as well as the SWL. Frequency coverage is continuously tunable from 540 kc to 31 mc. • patented crystal filter provides extreme selectivity to attenuate closely adjacent interfering signals • Unusually stable BFO • large, comfortable and conveniently positioned controls.  
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**\$14.41 per month for 18 months. Matching speaker—\$14.50**

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Write for our latest bulletin. We have hundreds of standard brand pieces of equipment in our trade-in department—used equipment made by Johnson, National, Collins, Hallcrafters, Gonset, Elmac, Harvey-Wells, Morrow, Central Electronics, and other leading names.

Our prices on trade-ins are realistic and down to earth. In addition where purchase is for cash with no trade-in, an additional 10% discount is allowed. Burghardt's financing plan tailored to your budget can be used for the purchase of new as well as used equipment.

73,

Stan Burghardt WJBV

"Your confidence is our most valuable asset"

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## IMPOSSIBLE? NO!

**A Single ROBOT Antenna for ALL BANDS, 80 thru 10, with Automatic Impedance-matching on ALL BANDS — NO SWITCHING — NO COILS — with MAXIMUM OPERATING EFFICIENCY.**

**Erectable in small space — EVEN ON A ROOFTOP! It's the famous V-37 Electro-magnetic decoupled vertical from the laboratories and factory of the ANTENNA ENGINEERING CO. The price? V-37 deluxe, \$299.00 with TERMS AVAILABLE. The AEC also produces the V-72 at \$199 and the V-70 at \$99 covering ALL BANDS with the AEC SB-75A unit at extra cost.**


**We make antennae for MILITARY, COMMERCIAL and MARINE uses and our Laboratory is available for ANY Antenna Research, Testing and DEVELOPMENT. Write us for details and how we can help you.**

**See our Ad in QST for March '55 or The Radio Amateur's Handbook!**

### ANTENNA ENGINEERING CO.

5021 W. Exposition Blvd.

Los Angeles 16, Calif.



# GPR 90

**TECHNICAL MATERIEL CORPORATION**  
Mamaroneck, N. Y.



### PLYTUBULAR BEAMS

**THE GREATEST ADVANCE  
IN ROTARY BEAM DESIGN  
OF THE PAST 20 YEARS.**

- LESS VIBRATION
- LESS WEIGHT
- LESS ICE LOADING
- LESS WIND DRAG

ALSO TENNAKITS FOR BUILDING  
YOUR OWN HIGH QUALITY BEAM

See your distributor or write

**TENNALAB - QUINCY, ILLINOIS**

**ALL TRUE  
AND  
STRONGER  
TOO!**

stations in North Carolina elsewhere in this month's copy — E. P. T.J. W4LXZ ready to go on 420; W4UIW getting set.

**W5FPB, Albuquerque, N. Mex.** — Albuquerque V.H.F. Club organized officially, with 23 members present at first meeting, April 22nd. W5FAG now has high-powered c.w. rig on 144 Mc. and is looking for DX skeds. Several West Coast stations, W7VMP or Phoenix, Ariz., and W7s FGG and UPF of Tucson, are already cooperating. Frequencies: W7VMP — 144.0165; W7FGG and W7UPF — 144.126 Mc.

**W5SCX, Ardmore, Okla.** — AF MARS net meets each Sunday morning at 0700 on 143.99 Mc. for propagation check. W5AXY, Austin, Texas, NCS, was \$9-plus over 300-mile path, May 1st.

**W6ORS, Alhambra, Cal.** — New club, San Bernadino Microwave Society, meets at home of W6VIX, Ontario. All interested in "a.c. bands" are invited.

**W7TMU, Snohomish, Wash.** — New activity developing on 50 Mc. since appearance of Technicians, April 12th. Now have 11 stations using the band locally, with more to come. Activity on 144 Mc. dropped, it is hoped temporarily, as a result of polarization controversy.

**W7UKI, Marysville, Wash.** — Experimenting with 1N34 crystal mixer, heard W7TMU, 15 miles away, while using only indoor folded dipole. Believe it would make a satisfactory converter if used with good r.f. amplifier and crystal-controlled injection.

**W7YJE, Seattle, Wash.** — First good 50-Mc. opening of the season, May 14th. W7s PRW UFE and DYD worked around 10 stations each in Southern California. Local 6-meter gang check band nightly at 1900 PST.

**W8HCD, Dayton, Ohio** — Six-meter band used locally principally for contests. Activity otherwise is low because of Channel 2 trouble. Have been able to put out up to 10 watts without TVI, using either c.w. or f.m. Amplitude modulation increases TVI potential greatly.

New 32-element 144-Mc. array at 50 feet above ground outperforming old 5-over-5 (at 40 feet) beyond description.

Use of 420-Mc. band picking up to point where contacts can be made occasionally without prior arrangement on another band. Working on flying-spot scanner, having experienced trouble getting 5527 to work. Would like to hear from TV enthusiasts regarding results with 5527.

**W9LEE, Westboro, Wisc.** — Skeds with W9LVJ, Waukesha, 175 miles, 0730 and 1900 CST, 144.18 Mc., and W9BBN, Grand Marais, Minn., 190 miles, 0745, 144.13 Mc., now running close to 100 per cent successful since coming of warmer weather.

**W9UDD, Ft. Wayne, Ind.** — Local gang busy modifying former police and fire receivers for 2490 and 1634 kc. for use with 50-Mc. converters in local mobile net formerly on 29.62 Mc. Converter to have 6BQ7 g.g. r.f. stage and mixer with 6J6 oscillator-doubler. Aiming for simplest possible construction.

**W9QMF, Perryville, Mo.** — New 12-element long Yagi erected for 144 Mc., to compare results with former 5-over-5.

**W9RSP, Marvin, S. Dak.** — Skeds on 144 Mc. with W9HXY, St. Cloud, Minn., 170 miles, highly successful. W9LEE and W9DSP, 400 miles, worked occasionally.

## YL News & Views

(Continued from page 55)

— another multiplier — I couldn't give up W9CXY. An hour later the burning odor persisted. Not my transmitter, I happily thought. Then — oh no — our dinner! Must save it and our once happy home. Wonder if I can keep the rig when our divorce is final? Our dinner looked and tasted like a prehistoric man dug from the peat bogs. There was no conversation.

But I wouldn't have missed it — not even for a kilowatt with a charmed maintenance life and proper voltages on the oscillator. Take it from a seven year 'phone gal, c.w. is here to stay and contests are a very pleasant form of mayhem.

The finishing touch to Merle's first c.w. contest

(Continued on page 136)

# new SELF-SUPPORTING LAY-OVER TOWER

ONE MAN INSTALLATION  
USE NO CONCRETE

## Tele-Vue

**TOWERS, INC.**

701-707 49th St., So.  
St. Petersburg, Florida

These two towers  
not interchangeable

Change beam from ground level. Telescope to 20 ft. with ratchet reel then crank over with second reel. Tower is re-inforced  $\frac{3}{4}$  in. aircraft tubular steel—husky but light. Base post heavy 3 in. steel pipe with fins.  $\frac{1}{8}$  in. — 1200 lb. test aircraft cable on layover reel. Tower finished 2 coats plus asphalt protective coating supplied for base section.

\$85.50 F.O.B. St. Petersburg  
PACKED IN STRONG SHIPPING CARTON

## OUR REGULAR TELESCOPING TOWER USED BY HUNDREDS OF HAMS

Stop it any height 20 to 40 ft. Lower for storms. Hinged bottom. Install it yourself. SPRING LOADED RATCHET WINCH CAN BE PADLOCKED. Good looking, husky yet light.  $\frac{3}{4}$  in. aircraft steel. Hoist cable tested for 920 lbs.

\$53.50 F.O.B. St. Petersburg  
PACKED IN STRONG SHIPPING CARTON

TAMPED  
EARTH

5 FT

## PREMAX

## "CA" BUMPER MOUNTING FITS ANY CAR

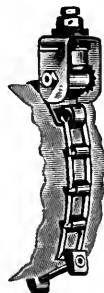
**Mount Your Mobile Antenna without Drilling or Marring!**

Even the massive bumpers of new 1955 cars can be outfitted with Premax's newly improved "CA" mobile antenna mounting, *without* spoiling chrome finish. Mounting includes extra chain links and braided copper wire ground lead. Ask your dealer for the "CA", or write,

Division  
Chisholm-Ryder Co., Inc.

**PREMAX PRODUCTS**

5582 Highland Avenue, Niagara Falls, New York



## Here's Why!

There's no drilling or damage to Bumper or splash-pan necessary. "CA" Bumper Mounting is fully adjustable with 9 links of chain. Add or remove links as needed!

# VALPEY

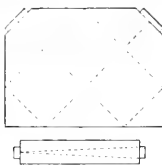
## Quartz Crystals

symbol of craftsmanship  
for over 23 years

Valpey measures each crystal for surface flatness using a Precision Optical Flat with monochromatic light in a Valpey-designed Interferometer. Parallelism and surface flatness are measured to millionths of an inch — another step in the Valpey quality control process.



Manufacturers of ultrasonic transducers and delay lines are assured the ultimate in equipment performance when they specify Valpey. For experimental labs or production runs, Valpey is equipped to provide crystals to 60 Mc., meeting the most rigid specifications.



**VALPEY** Crystal CORPORATION

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Craftsmanship in Crystals since 1931

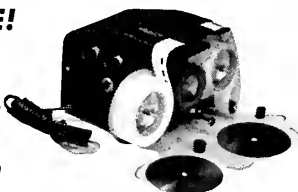
### LEARN CODE!

SPEED UP Your  
RECEIVING  
with G-C

Automatic Sender

Type S

\$28.00 Postpaid in  
U. S. A.



Housed in Aluminum Case Black Instrument Finished. Small—Compact—Quiet induction type motor, 110 Volts—60 Cycle A.C.

Adjustable speed control, maintains constant speed at any Setting. Complete with ten rolls of double perforated tape. A wide variety of other practice tapes available at 50c per roll.

**GARDINER & COMPANY**

STRATFORD

NEW JERSEY

attempt was notification by the YLRL that she had placed second highest in the OM c.w. portion of the contest! Her rightful conclusion: Merle is a name common to both sexes and contest checkers tossed her log on the OM's pile.

### Keeping Up with the Girls

Congratulations to W1ZJE, Lillian Salter, who completed her 25th year with the ARRL Communications Department on May 12th. . . . W2JZX has resigned as PAM, OPS, and OBS and will be off the air while she moves from Long Island to New York City. K2IWO, Hilda, will take over for Vi as Second District Chairman for the YLRL until the end of her current term, July 1st. . . . W3s LGY, HPP, HUX, and KL7BHE/W8 attended the Doghouse Net picnic in May at Columbus, Ohio. . . . W4BLR, Kay, made BPL for April. . . . W8NNH's contacts with EA8BF, Canary Islands and GD3IBL, Isle of Man, have spurred her on to more DX hunting. . . . KZ5DG has 100 countries confirmed on 'phone on 15 meters. Grace became the first station in the western hemisphere to contact Gambia on 15 meters when she worked ZD3BFC in March (only station in that country on that band). When FM7WN put Martinique on the 15-meter band in April, Grace was his first contact. . . . WN0AYQ, of Ladue, Mo., can be numbered among the younger YLs — Bonnie is 8 years old. . . . On April 23rd, the Chicago unit of the YLRL celebrated its second anniversary with an open house at its club rooms. One hundred fifty guests heard speeches by OM's W9s LLX, LZ, HPG, YIX and representatives of nearby radio companies. . . . Mrs. Lillian Root, Chairman of Women's Activities for the Dayton Hamvention reported 146 YLs and XYLs in attendance at the popular Ohio affair. . . . While newspaper men visited VE6MP, Maude demonstrated ham radio by making a 5/9 contact with W1MCW, Lou.

### YLs You May Have Worked

Mary G. Livingston, "Marian," W5EYE, was chosen "Operator of the Month" (December, 1954) of the Fourth Army Area. She received an Army MARS certificate in recognition of her outstanding assistance



to the MARS program. Marian averages 65 hours per month on scheduled MARS nets and handles an average of 80 messages during that period. Her favorite bands are 75 and 40 c.w. She is particularly interested in antenna experimentation. Her OM is W5KXJ, and there are four jr. ops at their Sheldon, Texas, QTH.

### Strays

Have you heard the swinging choke song — *Dance with Me Henry?* — W8DBF

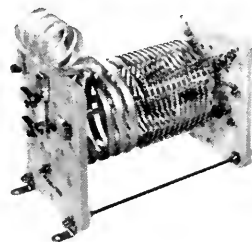


# GPR 90

**TECHNICAL MATERIEL CORPORATION**  
Mamaroneck, N. Y.

# 1 KW PI-NETWORK TANK COIL With Full Bandswitching ALL IN ONE COMPACT UNIT

Here's an integral high-power bandswitching pi-network tank coil for maximum efficiency operation from 80 through 10 meters. Designed for class "C" or linear operation using triodes or tetrodes in conventional or grounded grid circuits, Model 850 lets you easily select the desired operating band through its positive-acting, high-current, r-f switch. Stepped sectional coil windings, of extra heavy conductor at the higher frequencies, provide ample current carrying capacity and a minimum "Q" of 300 over the entire operating range. Quality construction throughout assures long life and an extra margin of safety. See this bandswitching inductor at your nearest B&W distributor. Or, write for Bulletin 850.



## MODEL 850

Output Impedance: 50 to 75 ohms.

Input: 1 kw with plate voltages from 2500 to 3000 volts d-c.

Price: \$35.00 Amateur Net.

**B&W**

**BARKER & WILLIAMSON, INC.**

237 Fairfield Ave.

Upper Darby, Pa.

## MAKE PRINTED CIRCUITS

Give your work a neat, professional look with compact, printed circuitry! New, **CONTROL CIRCUITS** "Kit No. 1" contains all materials needed to make several commercial-size printed circuits. Easy to follow instructions and circuitry design pamphlet included. Money back guarantee.

"Kit No. 1" ONLY \$3.95 postpaid

**CONTROL CIRCUITS**

P.O. Box 126

Rockfall, Conn.

## GET INTO ELECTRONICS

You can enter this uncrowded, interesting field. Defense expansion, new developments demand trained specialists. Study all phases radio & electronics theory and practice: TV; FM; broadcasting; servicing; aviation, marine, police radio. 18-month course. Graduates in demand by major companies. H.S. or equivalent required. Begin Jan., March, June, Sept. Campus life. Write for Catalog.

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EXPLAIN DOW LEADERSHIP

Model DKC



1000 WATTS  
Length 4 1/2",  
width 3"

Special connector protects your receiver from R.F. during transmission (Optional).

Silent AC magnet prevents hum modulation of carrier — AC types guaranteed as quiet as DC.

Transmit contact-pressure over 75 grams, making the 1000 w. rating very conservative. Causes negligible change in SWR up to 100 Mc.

DKF2 rigid adaptor for external chassis mounting, \$1.85



AC types (All volt.) Amateur net.....\$10.50

DC types (All volt.) Amateur net..... 9.50

See your distributor. If he has not yet stocked Dow Co-axial relays, order from factory. Send check or money order or will ship COD. Prices net FOB Warren, Minn. Shipping Weight 9 oz. Dealers' inquiries invited. Literature on request.

Add \$1 for external switch (Optional)

Add \$1 for special receiver protecting connector (Optional)

**THE DOW-KEY CO., INC.**  
WARREN, MINNESOTA

**Evans RADIO**

• "YOUR FRIENDLY SUPPLIER"

- ▶ Service to hams by hams.
- ▶ Nationally accepted brands of parts, tubes and equipment.
- ▶ Trade-ins and time payments.

**Write W1BFT**

P.O. BOX 312

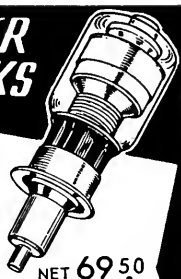
CONCORD, N. H.



## for HIGH POWER PI NETWORKS

### VACUUM VARIABLES 10 KV . . . 10-400 MMF

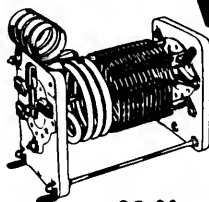
A beautiful, brand new, Jennings Vacuum Variable offered at half price as a result of a fortunate contract cancellation procurement. This is an ELMAR exclusive. See our QST ad for November 1954, page 143.



### B-W'S BRAND NEW MULTI-BAND INDUCTOR

an all-band inductor with KW rating for pi networks. Built around a real heavy-duty switch. Lowest losses, (minimum Q of 300 for all bands) fastest band change. Size, including switch, no larger than older style roller coils . . .

. . . EFFECTIVE . . . EFFICIENT.



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ELECTRONICS**

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ELVIN W6TT  
MARIO W6DUB

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The "Whipload 6" provides high efficiency base loading for mobile whips with instant bandswitch selection of six amateur bands: 75, 40, 20, 15, 11 and 10 meters. On 75 meters a special capacitor with dial scale permits tuning entire band. Covers other bands without tuning. Air-wound coil provides extremely high "Q". Fibre glass housing protects assembly. Mounts on standard mobile whip.

Cat. No. 250-26 **\$19.50** Amateur Net

**E. F. JOHNSON COMPANY**

WASECA, MINNESOTA





# GPR 90

TECHNICAL MATERIEL CORPORATION  
Mamaroneck, N. Y.

## QST — Vol. IV

(Continued from page 58)

### (b) Broadcasting:

Melba (famous opera and concert star) sang over the Marconi radiophone station in Chelmsford, England.<sup>38</sup>

The De Forest Company began sending out nightly news-service, on 1,650 meters, with a 1-kw. radiophone located on top of the World's Tower Building, New York City.<sup>39</sup>

The Naval Communications Service broadcast a concert given by Mme. Tettrazini. This originated in her apartment at the McAlpin Hotel (in New York City), and was sent, via Bell Telephone, to the Naval Communication Service's station at 44 Whitehall St.<sup>40</sup>

In "Strays," the following appeared, on page 47 of the February, 1921, issue: "Wondering who KDKA is? Westinghouse Elec. & Mfg. Co., East Pittsburgh, 375 meters."

Later, in 1921, a church in Pittsburgh made a practice of picking up KDKA's church service broadcast each Sunday and delivering it to the parishioners via a loudspeaker installed in the pulpit.<sup>41</sup>

### (c) Ship-to-shore radiotelephone:

Green Harbor, Massachusetts (1XD) began experiments with the "KQ" Boats.<sup>42</sup>

A.T.&T. "bought into" the R.C.A.<sup>43</sup>

Near Jacksonville, Florida, the Lybeck Ocean Harvester Co. installed a radiophone on one of its fishing craft, and began experimental contacts with shore on 350 meters.<sup>44</sup>

### (d) "Firsts" or "Near-Firsts":

The QSL card for use in reporting amateur signals over distances of 500 miles was first suggested.<sup>45</sup>

A radiotelephone mounted in an automobile, was exhibited (by SDR) at the annual outing of the Radio Engineering Society of Pittsburgh, held on July 18, 1920.<sup>46</sup>

At station 4BQ (Rome, Georgia), an arrangement whereby a telephone line could be connected to a radio receiver was in operation. It was used to distribute distant radio concerts to friends.<sup>47</sup>

The May, 1921, issue of QST contained the first intimation that the League would like to publish a "Handbook" of its own: ". . . One of the things we want to do is to publish a real textbook on radio; a book different from any other

(Continued on page 140)

<sup>38</sup> 41, August 1920.

<sup>39</sup> 48, January 1921.

<sup>40</sup> 41, February 1921 (item re Radio Traffic Ass'n, Brooklyn).

<sup>41</sup> See: "The Invisible Minister," 26 June 1921.

<sup>42</sup> 28, November 1920 (Entwistle's Report). This was on 395 meters. The Independent Wireless Telegraph Co. cooperated.

<sup>43</sup> 48, December 1920.

<sup>44</sup> 37, July 1921 (Merritt's Report).

<sup>45</sup> 41, August 1920.

<sup>46</sup> 26 to 27, September 1920 (Service's Report).

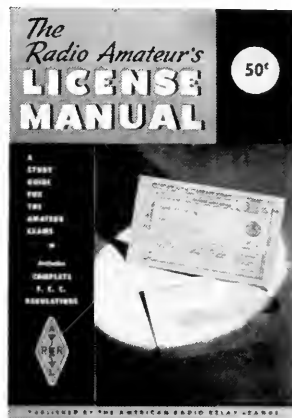
<sup>47</sup> 39, May 1921.

# UP TO DATE . . .

**THE** 34th edition of the Radio Amateur's LICENSE MANUAL is complete, up to date and revised to include latest information on amateur licensing. Contains the new mail-examination regulations, information on all the latest questions included in FCC amateur exams, all the dope on frequency privileges for the various classes of amateur licensees, the full text of RACES regs, details of the U.S.-Canada Reciprocal Operating Agreement and code-practice schedules, and the current FCC examination schedule. A useful manual for all, newcomer and oldtimer alike.

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### VIKING ADVENTURER



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Radio and Electronic Supplies

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### ANTENNA CONNECTOR

For Mobile Antennas  
(Potent applied for)

Connect or remove your antenna in less than 5 seconds. No wrenches, pliers, or screwdrivers.

Positive lock — Will not corrode. Machined from stainless steel.

AMATEUR NET

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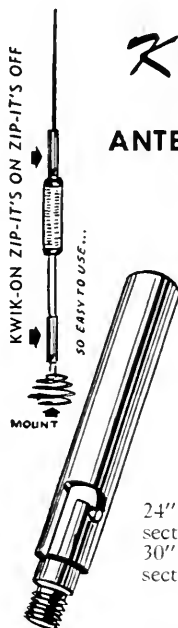
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**WHIP ANTENNA**

actually out performs metal whips

- will not corrode
- high flexural and impact strength
- will not take a set
- light weight
- excellent insulation even at high frequencies

**Shorter resonant length**  
Made by the pioneer manufacturer of FIBERGLASS fishing rods. Industrial applications solicited

—with 3/8-24 thd chrome-plated brass fittings  
Whips: 54"—\$5.75 90"—\$6.95  
Base Extensions: 18"—\$3.95 36"—\$4.70  
prices amateur net

If your jobber can't supply you, write

Subsidiary of Shakespeare Co. Columbia, S. C.

**EXTREMELY STABLE MOBILE VFO!**

Only 4" x 4½" x 5", this stable mobile VFO is designed for steering post or under-dash mounting. Drives any straight pentode crystal stage. Vernier dial calibrated 80, 40, 20, 15, and 11-10 meters. 6BH6 oscillator, 6BH6 amplifier/multiplier, OA2 regulator. Requires 6.3 volts at .45 amps, or 12.6 volts at .25 amps. 250-300 VDC at 20 ma. Complete kit, with tubes:

Cat. No. 240-152 **\$33.95** Amateur Net  
Available wired and tested with tubes, **\$49.95**

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It is easy and pleasant to learn or increase speed the modern way — with an **Instructograph Code Teacher**. Excellent for the beginner or advanced student. A quick, practical and dependable method. Available tapes from beginner's alphabet to typical messages on all subjects. Speed range 5 to 40 WPM. Always ready, no QRM, beats having someone send to you.

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one now in existence, dealing with the basic theory of amateur radio in a way that will give every amateur operator a clear theoretical understanding of how his apparatus functions so that he may experiment intelligently and not haphazardly; and a book that will likewise serve as a text for the non-technically trained individuals who in increasing numbers are taking up the study of Citizen Wireless." <sup>48</sup>

(e) "Curiosities":

The editor of *QST* announced that he had on hand enough "Calls Heard" lists submitted by amateurs to fill several thousand pages of the magazine. <sup>49</sup>

Station 9ZN covered the Moran-Leonard fight, at East Chicago (20 miles from the "windy city") with a De Forest radiophone and a portable ¼-kw. radiotelegraph spark transmitter. This was done for the Chicago "Herald Examiner". <sup>50</sup>

Arthur W. S. Davis (1LD, of Lowell, Massachusetts), an elderly amateur, had his radio station moved into his sick room, during his last illness; and he "worked it" almost up to the last minute of his life. <sup>51</sup>

Radio 8ZW purchased 550-Volt D.C., for his c.w. set from the trolley company for 50¢ per month. <sup>52</sup>

At radio 6WN (San Diego, California), a 5-step amplifier allowed the signals of 6MZ (Del Mar, California) to be read by *sense of touch*. <sup>53</sup>

In this "Foreword" I have been able to mention only the "high-spots" of this remarkably interesting Volume of the magazine. An examination of the Index itself will "fill in the details." "All-in-all," Volume IV merits plenty of attention.

— S.B.Y., WØCO

Rural Route 3, Box 94,  
Wayzata, Minnesota,  
July 12, 1953.

Part II of WØCO's index to Volume IV of *QST* will appear in a subsequent issue. — Ed.

<sup>48</sup> 28, May 1921. ("Our Bonds").

<sup>49</sup> 54, August 1920.

<sup>50</sup> 48, December 1920.

<sup>51</sup> 49, March 1921.

<sup>52</sup> 44, April 1921.

<sup>53</sup> 51, May 1921.

## Strays

Articles published in *QST* invariably bring the authors considerable mail from readers desiring clarification or amplification on certain points. While such interest is always welcomed, authors are often hard put to handle such correspondence in volume. To expedite replies, readers should: 1) enclose stamped self-addressed envelopes; 2) when using club stationery include the secretary's address; 3) sign correspondence with full names and mailing addresses in addition to call signs; and 4) stress legibility when handwriting.

# Palco

## BANTAM 65

THE SMALLEST, MOST COMPACT  
MOBILE TRANSMITTER WITH  
65 W—PHONE • 90W—CW

### MOBILE POWER SUPPLIES

#### Model 606-6V Kit

500V DC 225 Ma.; no battery drain on standby; instant start, stop—no waiting; communications type Vibrator; size 6 x 7 x 6 $\frac{1}{2}$  in., mtg. plate, 6 x 9. Small and rugged.

Shipping weight, 14 lbs. .... \$29.50  
(Factory wired, \$7.50 extra)

Model 612-12V Kit. .... \$33.50  
(Factory wired, \$7.50 extra)

#### Model 6A

Complete power supply; 6 Volt input; output power selector sw.—Pos. #1, 500 V 225 Ma.—Pos. #2, 400 V 170 Ma.; built-in relay for remote control; On-Off sw for local control; 700 Volt filter condensers; extra heavy duty Vibrator. . . \$39.50

Model 6115 AC Power Supply—to operate Bantam 65 as a fixed station. .... \$39.50

Model PTH Top Hat—will improve the efficiency of any mobile whip. .... \$2.50

Model 6144 2-Meter Phone and CW Transmitter  
Price and delivery to be announced.



The Palco Bantam 65 is highly compact—4" high, 8" wide, 8 $\frac{3}{4}$ " deep—allowing for maximum leg room. It employs a separate modulator section on a chassis 2" x 2 $\frac{1}{8}$ " x 11" that may be mounted wherever convenient. In addition, the Bantam 65 offers such outstanding features as . . .

- Built-in VFO with 2 crystal positions
- Filament input either 6 or 12 Volts; plate supply requirement 600 Volt max. @ 250 Ma.
- Band switching—6 bands
- VFO and exciter stages are ganged-tuned
- Pi-Section output
- Built-in antenna change-over and receiver silencing relay
- Separate input for high impedance and carbon microphone
- Break-in operation on CW
- AB<sub>1</sub> modulation employing netagive peak clipping

BANTAM 65, complete with tubes and power connectors. . . \$159.50

For additional information, see your  
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**STAY ON THE AIR!**

**BEAT TVI**

with the amazing, NEW **AMECO LOW PASS FILTER**

The AMECO low pass filter suppresses the radiation of all spurious signals above 40 Mc. from the transmitter. The filter uses a Constant K Circuit, and is designed for Coaxial cable (52 to 72 ohms). Other features include:  
• Negligible Insertion Loss • 35 Db and more attenuation of harmonic & spurious frequencies above 50 Mc. • Will handle up to 200 watts of RF power • Each unit complete with bracket, and instructions

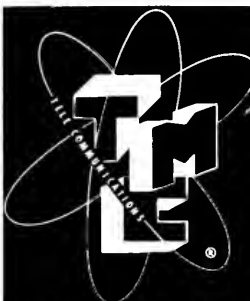


Model LN1 with 2 RCA phono jacks . . . \$1.95  
Deluxe Model LN2 with 2 SO-239 Coax. Connectors . . . \$3.45

Available at leading Ham equipment distributors, or write:

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1203 Bryant Ave. (Dept. Q 7) New York 59, N. Y.

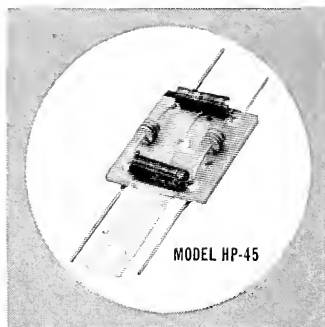


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## SUPPRESS TELEVISION INTERFERENCE

The Regency Model HP-45 High Pass Filter is a constant "K" type filter with a cut-off frequency of approximately 45 mc. in a 300 ohm balanced line. Attenuation at 29 mc. is approximately 20 db. At frequencies of 14 mc. and below, the attenuation is 40 db. or more. Signals above 55 mc. are passed through the filter without loss. Simple to install—full instructions included with each unit.




# Regency

DIVISION OF I.D.E.A., INC.  
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• High Pass Filter—List 99¢

**ROHN NEW  
No. 30 HEAVY-DUTY  
COMMUNICATION  
and AMATEUR  
RADIO TOWER**



**Proved  
in Construction,  
Design, and Operation**

Made of heavy-duty tubular steel, electric welded throughout. In 10-ft. sections for easy erection, 18-in. triangular design. Can be used non-guyed to 66-ft.—guyed to 200-ft.


**Call your Rohn representative or write, phone or wire:**

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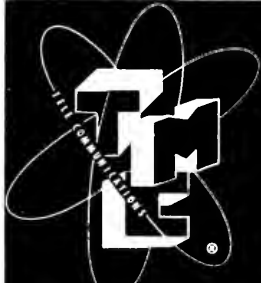
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540-1680 Kc. plus 1680 Kc.—34 Mc. in 3 bands. Calibrated bandspread, antenna trimmer, "S" meter. Ham net. **\$149.95**



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**GPR  
90**

**TECHNICAL MATERIEL CORPORATION**  
Mamaroneck, N. Y.

## Correspondence

(Continued from page 49)

were saying they would have found that they were mostly foreign commercials. . . .

— C. J. Haas, W0BLI

## IDENTIFIED

9835 Calumet Ave.  
Chicago 28, Ill.

Editor, QST:

I'll bet you a wooden nickel I can identify the "unlicensed" station "DA" mentioned on page 50 of March QST. That has been so long ago I won't have to take refuge under the Fifth Amendment.

I believe this was a rig using 4 Navy VTIs and using B batteries for plate voltage.

To my personal knowledge this transmitter was used at Seagate—old WST-NAH7—with regular station antenna, but I believe it was also used at several other locations around Brooklyn and New York City. . . .

— Levin J. Peck, W9FAW

## LISTENER REPORTS

RCAF Station Gander  
Gander, Nfld.

Editor, QST:

. . . Financially, SWL QSLs are embarrassing. If I had replied to all the QSLs and letters that I've received from SWLs since going high power (for Canada at any rate) I'd have had to spend 4¢ per card as well as 4¢ for mailing that card, and for the SWL cards that I've received without the International Reply Coupons alone, it would have cost me \$38.04. Now I ask you—is that fair?

— A. Velleman, VO2AW

U. S. Naval Air Station  
Box 12, c/o FPO  
San Francisco, Calif.

Editor, QST:

. . . Being a KG6 SWL I spend a good part of my tin e listening in on 20 meters out here in Guam.

After spending a few hours drawing up a card with the help of a local ham, and a few more photographing and printing the cards up, I was in business. After listening to so many stations saying they QSL 100 per cent I thought that I would do pretty good, so started mailing out the cards. All the cards go airmail and it must not be local stuff as most of them cost me twenty five cents airmail. Also enclosed are the proper amount of International Reply Coupons. I have a few hundred dollars worth of radio to SWL with and don't have too much trouble hearing stations all over the world.

What I would like to know is the secret to get some QSL cards in return. After a few months of trying I have received one from a W6 and one from a PY2. Haven't given up trying as I sent out 15 more this morning.

— Robert H. Davis, HM1, USN

## NOR THIS WAY

3804 Rexmere Rd.  
Baltimore 18, Md.

Editor, QST:

. . . I wonder if Mr. Proetz (May QST, p. 54) can give me an answer for the following? On May 6, 1952, at 6:25 p.m. EST, I worked VQ2DT, Dave R. Taylor of Kitwe, Northern Rhodesia. I sent a QSL to him that same day followed at decent intervals by others, then a letter. No answer to any of them. Then on March 6, 1953, I sent another letter containing five International Reply Coupons. I still have not received his QSL. On January 6, 1952, at 3:25 p.m. EST, contacted VQ3CP, J. A. Doxsey of Mwanza, Tanganyika. QSL card sent that day and subsequent ones, also a letter, but no reply. March 6, 1953, I sent him an airmail letter containing five International Reply Coupons, but to date I have no QSL from him. The same situation prevailed with VQ4ERR of Nairobi, Kenya.

Doesn't Mr. Proetz realize that QSL cards are required by ARRL and other organizations for purposes of verification when certain certificates are applied for? And may I

(Continued on page 144)

# MAMMOTH CRYSTAL CLEARANCE SALE!

Save Money—Order in  
Package Quantities!

Shipment made same day order received.  
All crystals tested and guaranteed to  
oscillate. Please include 20¢ postage for  
every 10 crystals or less. Minimum order  
\$2.50. No. C.O.D's.

## PACKAGE DEAL No. 1

25 Assorted FT-243 45 Assorted FT-241A  
15 Assorted FT-171B 15 Assorted CR-1A

**100 Crystals \$8.95**

Assorted.....Regular value \$66.00

## PACKAGE DEAL No. 2

FT-241A Crystals for Single Sideband  
370 KC-538 KC

**35 Crystals \$3.49**

Assorted.....Regular Value \$14.00

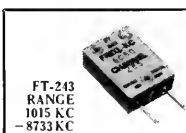
## PACKAGE DEAL No. 3

HAM BAND CRYSTALS — FT-243

For operating on 80, 40, 20, 15, 10, 6 and  
2 meters—on either fundamentals or  
harmonics.

**25 Crystals \$6.95**

Assorted.....Regular Value \$20.00



INDIVIDUAL CRYSTALS • Indicate 2nd choice—Substitution May Be Necessary

Low Frequency — FT-241A for SSB, Lattice  
Filter etc., .093" Pins, .486" SPC, marked in  
Channel Nos. 0 to 79, 51th Harmonic and  
270 to 339, 72nd Harmonic. Listed below by  
Fundamental Frequencies, fractions omitted.

FT-243 — .093" Dia. — .486" SPC

49¢ each — 10 for \$4.00

49¢ each — 10 for \$4.00

79¢ each —  
10 for \$6.50

370	393	414	483	506	529	400	459
372	394	415	484	507	530	440	461
374	395	416	485	508	531	441	462
375	396	418	487	509	533	442	463
376	397	419	488	511	534	443	464
377	398	420	490	512	536	445	465
379	401	422	491	513	537	446	466
380	402	423	492	514	538	447	467
381	403	424	493	515		448	468
383	404	425	494	516		450	470
384	405	426	495	518		451	472
385	406	427	496	519		452	473
386	407	431	497	520		453	474
387	408	433	498	522		454	475
388	409	435	501	523		455	476
390	411	436	502	525		456	477
391	412	438	503	526		457	479
392	413	481	504	527		458	480

79¢ each — 10 for only \$6.50

CR-1A  
SCR 522-1/2  
Pin, 1/2" SP

FT-171B — BC-610  
Banana Plugs,  
1/2" SPC

5910	7350	2030	2220	2360	3202	3850
6370	7380	2045	2258	2390	3215	3915
6450	7390	2065	2260	2415	3237	3955
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6497	7580	2105	2290	2442	3322	
6522	7810	2125	2300	2532	3510	
6547	7930	2145	2305	2545	3520	
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AUTOMATIC CODE PRACTICE  
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115 or 230 V @ 50-60 cycles. Portable.  
Built-in speaker and amplifier. Variable  
speed from 5 to 25 w.p.m. Uses inked tapes.  
Brand new.....\$19.95

79¢ each — 10 for \$6.50

1015	6100	6540	7150	8150	8500
3655	6106	6550	7250	8173	8525
3680	6125	6573	7300	8175	8550
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3990	6185	6640	7375	8360	
6000	6200	6650	7400	8370	8625

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BEAMED POWER—  
PERFECT MATCH—  
BALANCED PATTERN

YOU'RE THERE!  
—with

**TELREX**  
PRE-TUNED

**"BEAMED POWER"  
ROTARIES**

End your antenna problems with the precision-  
built rotaries that are pre-tuned and matched for  
optimum performance at your site **WHEREVER**  
**YOU ARE.** No tuning or adjusting necessary.  
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**A-27**

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• Q-Max provides a clear, practically loss-free covering, penetrates deeply to seal out moisture, imparts rigidity and promotes electrical stability. Does not appreciably alter the "Q" of R-F coils.

• Q-Max is easy to apply, dries quickly, adheres to practically all materials, has a wide temperature range and acts as a mild flux on tinned surfaces.

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(MONMOUTH COUNTY)  
Telephone: FReehold 8-1880



remind him to look on page 76 of the April 1955 *QST* and he'll see listed in the DXCC Honor Roll the call of VQ4ERR with 226 countries. How did he get it? By receiving QSL cards so he could send them to ARRL for verification, that's how! . . .

— Arthur W. Plummer, W3EQK

**PHENOMENON**

Jefferson City  
Missouri

Editor, *QST*:

. . . On an average of one night every three or four months during the period of the new moon at about midnight there is an echo on signals in the 2800-kc. region. A number of us on the Missouri State Highway Patrol c.w. net on this band have noticed the effect and no two agree on the cause. Our c.w. receivers are wired for full break-in, and on the nights in question, the operator can hear his own transmitted signal with a strength of about S8 and a delay of up to about 2 seconds.

The only details I can supply are these: The effect is usually first noticed about midnight at the station at St. Joseph, and here in Jefferson City anywhere from 30 minutes to 2 hours later. It seems to move in a southeasterly direction, usually observed at Poplar Bluff a half hour later than here. Some nights only one or two stations will notice the effect, but once, about three years ago, all of the Missouri stations heard it. The echo is never heard by any but the transmitting station. The duration of the effect varies from about 5 minutes to an hour.

Normally, on something like this, the cause might be attributed to too much "cough medicine," but with old-timers like W0BNQ, W5BML, W0KNG, W0RTG, W0ZAO, and a few others to vouch for me, I feel that someone else has probably noticed it too. Anyone want to volunteer a good explanation?

— Davis A. Helton, W0PME

**WHY SINES?**

5704 Ben Alder  
Whittier, Calif.

Editor, *QST*:

Just finished reading "YB's" letter in the April issue of *QST* (page 52) and would like to add my two-bits to his.

Having worked as railroad telegrapher and train dispatcher for 27 years I agree with "YB" that we should receipt for messages with our "sine," but it is nice, when just rag-chewing, to know the other fellow's name.

— J. E. Muncey, W6HUI

1178 High Street  
Central Falls, R. I.

Editor, *QST*:

. . . Well, "YB," I tried your system on c.w., but I must say it doesn't fare too well! I used "PB" instead of "Paul" for a sine, and 7 out of 10 replied, without fail, ". . . NAME OM? PSE RPT NAME OM" or better still, "CFM NAME PB IMI IMI." I got sick of this and went back to my old stand-by, P-A-U-L, and nobody ventured a query. When one comes right down to it, if W7OE ever gave me "YB" for his name, I'd query quite a bit also. So, Howard, we are not all telegraph office operators and I'm afraid legible names will have to be used if we want to save gray hairs! The initial "sine" system has some value, though — don't throw it out yet! Of most practical use would be on NTS — our ARRL c.w. traffic nets, where the use of names is totally unnecessary. But then, the call is sufficient so why bother with sines at all?

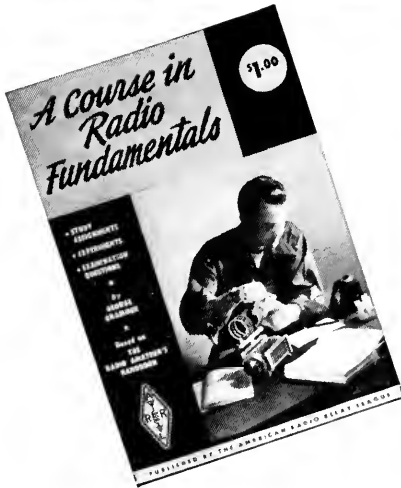
— Paul B. Boivin, jr., W1ZXA

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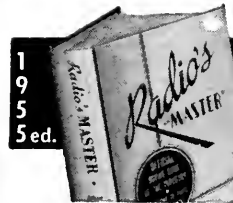
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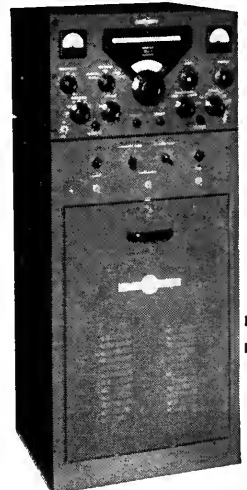
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# HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature, and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and sold by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply. To expedite handling of your copy please state whether you are a member of ARRL.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred, but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

*Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.*

**QUARTZ** — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

**MOTOROLA** used communications equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

**WANTED:** Cash or trade, fixed frequency receivers 28, 42 Mc. W9YIY, Troy, Ill.

**WANTED:** Early wireless gear, books, magazines and catalogs. Send description and prices. W6GHI, 1010 Monte Drive, Santa Barbara, Calif.

**CODE slow?** Try new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

**SUBSCRIPTIONS.** Radio publications. Latest Call Books, \$4.00. Mrs. Earl Mead, Huntley, Montana.

**URGENTLY** need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

**OUTSTANDING** ham list always. Our prices on trade-ins of all amateur brands are realistic and down to earth. We feature Johnson National, Collins, Hallcrafters, Gonset, Elmac, Harvey-Wells, Morrow, Central, P. Elec. Cones and other leaders. We trade easy and offer our own time-payment plan tailored to fit you. All leading brands of new equipment always in stock. Write today for latest bulletin, Stan Burghardt, W0BJV, Burghardt Radio Supply, Inc., Box 41, Watertown, S. Dak.

**DON'T Fail!** Check yourself with an up-to-date, time-tested "Sure-check Test." Novice \$1.50; General, \$1.75; Amateur Extra, \$2.00. Amateur Radio, 1013 Seventh Ave., Worthington, Minn.

**ANTENNA** for bandswitching transmitters up to 300 watts input, approx. 120 feet long, centered with 75-ohm line, 70 feet included, low SWR, tunes 80-40-20-10 meter bands. U. S. Patent 2,535,298. Each one tested for resonance on all bands. Send stamp for details. \$18.95 each. Latin Radio Laboratories, 1431 Sweeney St., Owensboro, Ky.

**CALL SIGNS** — Three color, reflectorized (glass-beaded), aluminum, 4" x 12", \$1.50 postpaid, includes mounting frame for car, rig or shack. Lackner, W9WFT, 2029 Bradley, Chicago 18, Ill.

**MICHIGAN HAMS!** Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel. 8-8696, No. 8-8262.

**2-METER** aluminum Brownie beams, \$22 and up. Write to H. W. Snyder, W3LMC, 4330 Glenmore Ave., Baltimore 6, Md.

**WANTED:** All types aircraft & ground transmitters, receivers, ART-13, RT18/ARC1, R5/ARN7, BC-610E, BC-221 mounts and parts wanted. Fairest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

**\$26** Worth of valuable radio parts for only \$6! Here are a few of the usable parts you'll find in this Army Surplus power supply unit: 1 Ninety second time delay switch; 1 adj. pilot lamp socket assembly; 1 interlock switch, 125V AC, 12 amp; 1 filter cond. 1 µfd. 200 VDC; 1 filter choke, 2 1/2 H. 2000 VDC; 6 rectifier tubes, 8336, 5000 V 25 A DC; 1 aluminum case, black crackle finish, 8 1/2" x 5 1/2" x 19"; 2 tube sockets, P 5EED ceramic; 2 plate caps, ceramic fil 836, etc.; 2 terminal strips, 3 terminal \$6 each; 2 for each \$2. Cash with order or C.O.D. Army Surplus Outlet, 91 N. Second St., Memphis 3, Tenn.

**ATLANTIC City** vacation! Commodore Hotel, Kilowatt accommodations at low power prices. Luxury rooms with bath and radio. Budget special rooms with running water. Write for information and reservations. Ben Robin, W2BIG, Manager, Commodore Hotel, 715 Pacific Ave., Atlantic City, N. J.

**QSLs?** State-map? Rainbow-map? Cartoon? Mobile? Largest variety samples 25¢ (refunded). "Kus" Sakers, W8DED, P.O. Box 218, Holland, Mich.

**QSLs!** Modern, better quality designs. Samples 10¢. Tooker Press, Lakehurst, N. J.

**QSLs.** Samples, dime. Printer, Corwith, Iowa.

**QSLs-SWLS.** Samples free. Backus, 5318 Walker Ave., Richmond, Va.

**QSLs:** Neat, reasonable, samples free. W3EHA, Cyrus F. Jones, 840 Terrace No., Hagerstown, Md.

**QSLs** — The kind you want. Samples 10¢. Graphic Crafts, Rt. 12, Ft. Wayne, Ind.

**DELUXE QSLs** — Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10¢.

**100 Free QSL cards** with order. Samples 10¢. World Printing, 166 Barkely, Clifton, N. J.

**QSLs-SWLS.** Meade W0KXN, 1507 Central Avenue, Kansas City, Kans.

**QSLs-SWLS.** Samples free. Bartinoski, W1YHD, Williamstown, N. J.

**QSLs-SWLS.** Cartoons, Rainbow, others. Reasonable. Samples 10¢ (refunded). Joe Harms, 225 Maple Ave., North Plainfield, N. J.

**QSLs of distinction!** Three colors and up. 10¢ brings you samples of distinction. Uncle Fred, Box 86, Lynn, Penna.

**QSLs.** SWLS. America's Finest!!! Samples 10¢. C. Fritz, 1213 Briar-gate, Joliet, Ill.

**QSLs.** Samples free. Albertson, W4HUD, Box 322, High Point, N. C.

**QSLs!** Two colors, \$2.00 hundred. Samples for stamp, Rosedale Press, Box 164, Asher Station, Little Rock, Ark.

**QSLs** "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

**QSLs!** Taprint, Union, Mississippi.

**QSL-SWL cards.** Sensational offer, Bristol stock 500 1 color \$3.95, 2 color \$4.95, 3 color \$5.95. Super gloss \$1.25 extra. Rainbow cards. Samples 10¢. QSL Press, Box 71, Passaic, N. J.

**QSL samples.** Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

**QSLs.** Postcard brings samples. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

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**QSLs.** Nice designs. Samples. Besesparis, W3QCC, 207 S. Balliet St., Frackville, Pa.

**QSLs.** Distinctively different. Postpaid. Samples free. Dauphinee, K0JCN, Box 66009, Mar Vista 66, Calif.

**QSLs-SWLS.** Varicolored, specialist, 10¢ samples. Snyder, W9HIU, 113 Harrison, Jeffersonville, Ind.

**UNUSUAL!** Vivacious! Illustrated QSLs, typolithographed. Free samples. WAT, Box 128, Breckville, Ohio.

**QSLs-SWLS.** High quality. Reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

**QSLs.** Something new — Different — All printed in 3 colors or more on glossy stock, \$3.85 per 100. Preference when ordering such humorous, plain or modern. Be surprised. Satisfaction guaranteed. 2-day service. Constantine Press, Bladensburg, Md.

**WANTED** and for sale: Want to buy 10 to 20 2-meter mobile installations, particularly commercial units like those from taxicabs, police, etc. Give complete details and best cash price. For sale: BC-221 frequency meter, Meissner signal shifter, SX-24 receiver, 750 volt 300 Ma. AC power supply. Brungton, W4NJE, Box 246, Lewisburg, Tenn.

**LEECE-NEVILLE** 6 volt system. 100 amp. alternator, regulator & rectifier, \$60.00. Also Leece-Neville 12-volt system 100 amp. alternator, regulator & rectifier, \$85.00. Good condition. H. A. Zimmermann, 570 Jamaica Ave., Brooklyn 8, N. Y. Ulster 2-3472.

**WANTED!** Policarman M-51; low or hi-freq. handie-talkies; Eldico EE-2. E. Howell, #450D, P.O. Box 126, Lambert, N. C.

**TECHNICIANS:** Get on six meters fast with Tecraft xtal control mixer converter 3 tubes only \$24.95. Mail for details. N.R.M. Wholesale Radio, Inc. 286 Teaneck Rd., Ridgefield Park, N. J.

**NEW** and used Motorola, Link, RCA, G-E, etc., FM commercial communications equipment bought & sold. Allan M. Klein, W2FOU, 95-33 225th St., Bellerose, L. I., N. Y. Phone FL 4-3394.

**WILL** Pay \$150 for good clean AN/ARC-1 20-channel preferred. Also BC-610E, BC-614E, BC-639, BC-729, BC-221, TCS and others. Cash for Sig. Corps, Navy, Air Force stock catalogs; maint. and instr. FM's for war surplus equipment. Amber Co., 393 Greenwich St. N. Y. 13, N. Y.

**PITTSBURGH Hamfest:** Sunday, August 7, 1955, at Totem Pole Lodge in South Park. Save 25% by registering in advance. Send check for \$1.50 to William E. Guthrie, 4949 Koberta Drive, Pittsburgh 36, Pennsylvania. Tickets are \$2.00 after July 22nd. This is the 17th annual Hamfest of the South Hills Brass Pounders and Modulators.

**NATIONAL** receivers SW-54, NC-88, NC-98, NC-125, NC-183, HRO-60 in stock. Attractive swaps or trades for used ham receivers and surplus equipment. Dynamotors — 6 VDC/420 VDC 280 Ma., good used, \$12.95; 12 VDC/440 VDC 500 Ma., including filter cage, standing untested, excellent \$16.95; surplus RG-8 U cable, 100 ft. \$5.95; 250 ft., \$13.25, 500 ft., \$25.00. Free Bargain Bulletin. Visit store for our unadvertised bargains. Lectronic Research, 719 Arch St., Philadelphia 6, Penna.

**PRINTED** circuits made by your drawings. Etched circuit supplies. Rowe Engravers, 492 East 39th St., Paterson, N. J.

**WE** will be looking for you at the ARRL Central Division Convention at South Bend, Indiana. October 15-16 are the dates. This will be the Big One for 1955! Advance registration \$3.50. Write to Box 551. Make checks payable to Central Division Convention. Do it now!

**RECENTLY** factory overhauled 75A-2, \$325.00; 32V-3, \$550.00. Eight (8) Raycon 3 1/2 ft. horns, \$50. George Sperry, 108 Oak Hill, Portsmouth, Va.

**20-15-10 DX** bands coming back. The VS baby mobile antenna, beautifully chromed, only 4 ft. high, is a DX natural. Weatherproof High Q plug-in loading coils, with chrome fittings available 75 thru 10. Trim appearance. Changes bands instantly. Adjustable to exact frequency. Perfect for 50-watt bandswitching transmitters. Effective on all bands. Replaces coiled or fender whip. Simple installation. Antenna with one coil and mounting hardware, \$12.95. Specify band. Additional plug-in coils, \$2.75 each. DX 3 coils, special, \$17.45. W6VS, Bill Davis, 225 Cambridge Ave., Berkeley, Calif.

UFO data compiled, W5CA.

S36A Hallcrafters receiver, \$100; NC183D, \$300. All equipment in perfect condition. Clement Gouveia, 3310 63rd St., Sacramento, Calif.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallcrafters, Hammarlund, Johnson, Lysco, Master Mobile, Morrow, National and other ham gear H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill. WANT: Good used receiver under \$100. Silvert, 44 Seaview, Marblehead, Mass.

REMEMBER Blossomland Amateur Radio Association's Hamfest picnic, July 31st at Warren Dunes State Park, 15 miles south of St. Joseph, Michigan, on U. S. 12. 10-meter transmitter hunt. Bring gear for swap and shop. Registration fee \$1.00 in advance or \$1.25 at the park. Advance registration through R. T. Hatch, W8JFW, 3225 Cleveland, St. Joseph, Michigan.

SELL: HRO-50, used 4 hours; Viking I TVI-suppressed, #432, \$175; Amertran 6200 V.A.C., C.T., 700 mils, \$60.00. Kaar 40-watt mobile, 10 meters, complete, \$30.00. Write for list. S. Macy, W4KTZ, 2346 Dundee Rd., Louisville, Ky.

FL8 audio filters, 2 for \$2.00 prepaid in USA. FT 154 shock mounts for BC348, \$2.00 each; BC614 speech amplifier, PCA-2T-200 Panafactor, BC638A frequency meter 100-156 Mc., will sell or trade for audio equipment or tape recorder. M. D. Haines, W5QCB, 1316 S.W. Military Dr., San Antonio 4, Texas.

10A: SSB exciter, factory-wired, late model; QTI circuit and 80-40.20 meter coils, in exc. cond., \$95.00. F.o.b. Hamden, Conn. R. II. Zeck, 1633 Whitney Ave., Hamden, Conn.

SELL: Lysco Model 600s 35-watt TVI suppressed transmitter, \$120.00; WRL Globe Trotter, \$40.00. Stan Echler, W8JVS, 827 Turner Ave., Toledo 7, Ohio.

FOR Sale: Complete station: 75A2-32V2 TVI suppressed; 700 watt 813 p.p. final, custom-built. Used 10 hours. 40 ft. V1X tower; Johnson 10-20 M. beam; prop pitch rotor. Price: \$1300. (Will take offers on units to be sold separately). Saper, W2RLX, 881 Cambridge Rd., Woodmere, N. Y.

QUARTZ Crystals. Full stock of marine frequencies. Heavy duty transmitting, \$2.95, receiving, \$2.50. C.W. Crystals, Box 2065, El Monte, Calif.

FOR Sale: Globe King B, \$325.00; BC455S, \$5.00; Browning pre-selector, \$10 power plate and mod. transformers, coils, condensers and many other units, 610 coils. Vettesse, W2OTI, Box 4, Pomona, N. J.

SELL: Hallcrafters S-76 in exc. condx. with Nov. '54 QST ant. trimmer, \$139.00. Also Hallcrafters HT-18, all band VFO in FB condx. \$59. Bob Martinez, K2DGT, 45-10 Kissena Blvd., Flushing, L. I., N. Y.

SELL: Terrific Bargain! Viking II, \$220; Collins 32V3, \$575.00, 75A3, \$450; H-18, \$10 call equipment like new, not a scratch, perfect in every way. W3LAT, Mars Theatre, Mars, Penna.

SELL: Gonset communicator #2, in gud condx, \$165. Bullion, 439 Ave. P., Brooklyn, N. Y.

FOR Sale: Telvar 1-60-2, 60 watt fone c.w., \$70. J. Klarnann, P.O. Box 531, Farmingdale, L. I., N. Y. Phone: Farmingdale 2-1669J after 6 P.M.

WYOMING Hamfest July 23-24. Excellent program. Tourist mobile welcome. See Hamfest Calendar this issue.

RECEIVERS - Transmitters, repaired and aligned by competent engineers, using factory standard instruments. Collins, Hallcrafters, Hammarlund, National. Our nineteenth year. Douglas Instrument Laboratory, 176 Norfolk Avenue, Boston 19, Mass.

SELL or Trade: Par-Metal Grey ER-227 relay rack with steel panels including 5" meter panel, \$45. National SW-54 receiver, perfect, \$32.50. Webster wire recorder, \$35. All above F.o.b. Belvidere, Ill.

WANT tape recorder complete or mechanism. Johnson Ranger or similar transmitter, RME-45 or similar communications receiver. Larry Kleber, Belvidere, Ill.

FOR Sale: CREI correspondence course. Section One (Introduction to Radio Engineering) and Section Two (Advanced Practical Radio Engineering). Late course. Complete with graded examinations. Perfect condition. Cost \$200. Will take \$50. Prepaid to you. Also a Pickett & Eckel model 500 Log Ortho-Phase slide rule with leather case. Perfect condition: \$10. Postpaid. W. Cook, W5LFB, 1614 Morson Rd., Jackson 9, Miss.

WANTED: Short wave communications receiver. Mr. W. Ellis, 1240 Burke Ave., Bronx 69, N. Y.

BC-1072A xmitter, 115V, AC, 150-200, 11 tubes 6SN7, 655, 807, 2-504K, 879, 9002, 2-9006, 2-826s, surplus, new, a bargain at \$25.00 F.o.b. W3CZE, 418 10th St., N.W., Washington 4, D. C.

BC610-E xmitter and BC-614E speech amp. Must sell for lack of space. Best offer cash & carry. H. C. Weidner, 1205 Ave. "C", Reading, Penna.

HANDIE-Talkies: Sale or trade, HT-144 (144-148 Mc.). Not surplus. New condx, complete with orig. schematic. Size 3" x 3" x 14", gray crackle, whip antenna. Ready to go on air. \$20.00 for pair F.o.b. Trade for new 4D32 tube, S-38 rcvr or what have you. W3CLP, 707 Edge Moor Rd., Wilmington, Del.

FOR Sale: Motorola FMTU30D FM mobile transmitter 150 Mc., complete with tubes and dynamotor, \$25. Ralph Villers, P.O. Box 1, Steubenville, Ohio.

GONSET SuperSix, \$37; Dynamotor, 6 in. 300 at 125 outp. dynamotor 12 imp 400 at 180 outp., \$5 each; 813s, new, \$7.50. K6JBI, 4261-63rd St., Apt. 2, Sacto, Calif.

AMATEUR Paradise vacation spot. Livingstone Lodge and log cabins, Mascoma Lake, Enfield, N. H. Swim, fish, boats, sports, 100 acres, eleven buildings, churches, recreation building, main dining lodge, 75 and 40 meter rig in lobby, family groups, 26th year, low rates. Booklet, At Livingstone, W2QPN, 12-01 Ellis Ave., Fair Lawn, N. J.

FOR Sale: NC-125, new, with speaker, in original cartons. Price \$175.00. C. W. Ehlers, 319 Union St., Jersey City 4, N. J.

BC610-E, BC614-E speech amplifier and HT-18 VFO. Coils 10 through 160 and 100-156 Mc. coils, \$495.00. Lysco 600S, modulated and TVI-suppressed, like new, \$95.00. E. P. MacKenzie, W8NGO, 430 University Place, Grosse Pointe 30, Mich.

LYSCO 600, like new, \$80. WSOZI., 338 Walnut, Ashland, Ohio.

HAVE lots of ham gear to swap. My list for yours. William McDonald, 15 Joslin, Providence, R. I.

SELL: All-band KW transmitter; PP 813s; 807 buffer. Sonar VF-X680; final power supply 3.5 KW Amertran, Variac controlled with triple filter section. Separate screen and bias supplies both electronically regulated. Fully metered. Best components used. Enclosed in deluxe Par-Metal cabinet. Spares, coils and manual included. Cost over \$1100; asking \$500 or near offer. W2TAM, 140 Summit Ave., West Trenton, N. J.

WILL trade a nice piece of lake frontage on Long Lake near Iron River, Wisconsin for a good transmitter and receiver (must be in good working condition). Will send pictures and further information upon request. Art Schmidt, Park Falls, Wis.

\$20 of used chemical equipment. Trade for ham gear. Wanted: relay, VFO, surplus equipment or anything. W5FIO, Roberts, Sweetwater, Texas.

SELL: Model 12 teletype with cover, table, keyboard and AC motors. Also W2BFD converter. All in excellent condx. W3MKZ, 87 College Ave., Annapolis, Md.

SELL: Triple power supply, 450V at 150 Ma., 750V and 1000V at 250 Ma., \$50. Ameco code course, records through 18 wpm, \$10. Paul Goldman, K2GKU, 248-54 54 Ave., Douglass 2, L. I., N. Y.

MUST sell slightly used TBS-50-D in original carton, \$85; filtered PE101-C, \$5.00; Brand new MB40-SL, \$13; 10 Biley EA 25-mtr xtals, \$1.00 each; new MM all-bander loading coil, \$12; MM 8 ft. whip, mount, bumper mount, \$10; Millen 10035 dial, \$4; base type PE103, \$27. K2AKW, 11 Montview Rd., Summit, N. J.

SELL: Receiver, NC-128X, in gud condx, just aligned; \$65; xmitter Parallel 807s, 80-40 20 meter coils, relays, xtal, TVI-suppressed. 100 watts, \$125. K2EYW, 307 No. Thurlow, Margate, N. J.

FOR Sale: Cash and carry, metropolitan area, complete station, not surplus including: Viking Ranger xmitter, factory wired, brand new; KC125 receiver, Mac matching speaker, and as new. Unit wired push to talk; includes cables, relay xtal mike, 20 meter Amphion antenna, balun coils, new 75 meter loaded whip, mounted prop pitch motor transformer; \$375 firm. Sherman Dennis, W2RTH, 414 N. Broad St., Elizabeth 3, N. J.

SEE you at Hamfesters Radio Club 21st. Annual Picnic and Air-mobile Meet at Mance Park near Chicago on Sunday, August 14th. Locations \$1.00 in advance, \$1.25 at the gate. W9EVC, Sec., 8908 So. Constance, Chicago 17, Ill.

TRADE pair 4-250A with special sockets, also have Jones Micro-Match. For Hi-Fi commercial cabinet with 12 in. coax speaker. State type speaker. WHIOL, 4 Halcyn Rd., Newton Center, Mass.

SWAP: Automatic Kollektief, case, filters, sunshade, panoramic head, flashgun & film; Stroboscan V strobe unit with extension lite and new battery. Both outfits in excellent condition, one owner. For: Viking transmitter or equivalent, rotor, 20 meter beam, etc. Harry Neumann, W1ZYI, 38 Overhill Rd., Milford, Conn.

SELL: Ameco Novice code course, slightly used, \$4.95. Donald Coughlin, R. R. 2, Paulding, Ohio.

FOR Sale: AT1 excellent, no scratches, \$26; Viking I with Viking VFO and spare 4D32 tube, excellent working order and appearance; \$22.00; KMYC Mac \$5 all band converter, new and unused, \$50; new RCA 810, \$5.00, new 3041L, \$5.00, new 100TH, \$4.00; GE 4 #1d 2000 volt condenser, \$3.00; RCA 100 Kc. standard, \$5.00; PR 1000 Kc. standard, \$3.00. W4NWW, 1714 Friendly Rd., Greensboro, N. C.

WANTED: Clean HQ-120X with speaker. Give details. Schultz, W2EEV, 1829 Cornelia St., Brooklyn 27, N. Y.

RANGER: For sale, Viking Ranger, factory-wired, new in February 1955, and never used; with tubes. First \$200 takes it. W2GVL, Riverside Ave., Amityville, L. I., N. Y.

WANTED: Tubes, boxed and unboxed; transmitting, receiving and special purpose industrial types such as Klystrons, etc. Also will buy your excess test gear, Hickok tube checkers. Variacs, etc. Will pay cash or swap you for choice equipment and tubes. B. N. Gensler W2LNI, 330 West 11th St., New York 14, N. Y.

LAYOUT - Drilling template for Chambers three control six-band 813 transmitter described in January 54 QST and ARRL Handbook. Complete layout, full scale, \$2.50. Adams, W1STX, 719 Great Plain Ave., Needham, Mass.

SIDE-BAND 10B exciter with converted BC458 VFO. Viking I with VFO, for sale. Any reasonable offer considered. Dr. William O'Rourke, Weller Bldg., Scottsbluff, Nebr.

VAN SICKLE has the new or used gear. Taylor 866As, \$1.95. Gene, W9KJF, 1320 Calhoun, Ft. Wayne, Indiana.

TRADE: 1955 Contina IIA, case and flash. Want good receiver. Will pay cash difference. H. Fessinger, KN6KID, 141 S. McCarty Dr., Beverly Hills, Calif.

FOR Sale: BC-638, BC639, BC640B, BC610E, BC614E. W5GO 6. 494 Alameda, Redwood City, Calif.

VIKING Ranger, new, push-to-talk and low pass filter, \$175. New 3 element 20 Shortband and 10 meter 3 element beam, Mon-Key, bandspread NC-100 ASD, W2JRW, Bob Collins, 33 McKinley Ave., Westwood, N. J.

FOR Sale: NC183rcv, tilt base and matching spkr, A-51 shape, \$195. Rcvr only, \$180 express paid. Dudney Anderson, 835 Curren, Cincinnati 16, Ohio.

SELL: \$40A, in perfect condx, \$65. Perry H. Laten, W0RFL, 345 W. 9th St., Fremont, Nebr.

SELL: Surplus VHF-UHF transmitting and receiving gear, tubes, antennas and mobile equipment. Send postcard for list and prices. Leroy May, W5AJG, 9428 Hobart, Dallas 18, Texas.

SELL: Gonset 10 meter converter, 10 and 20 meter beam, 30 foot tower, rotor, indicator, large and small plate and filament transformers, filter condensers, meters, tubes. Send for free list. R. A. Farmer, Cook Drive, Baldwinville, N. Y.

OFFER \$10. Any one copy QST May 1916 or before. W4AA, Wayne Nelson, Concord, N. C.

FOR Sale: One Premax 535 aluminum sectional radiator. With base, \$40.00. G. Yust, Chief Engr., Station KROC, Box 83, Owatonna, Minn.

SELL: SP-600 JX perfect condx; HRO5TA1 with spkr and extra 15 meter coil. Very clean; xmitter with 4-125-A final; 300 c.w. 600 W. SSB with 10A exciter, power supply and 6 ft. rack. Prices reasonable. W2WVF, 255 Eastern Parkway, Brooklyn, N. Y. NE 8-5273.

COLLINS 32V-3, \$565; 75A-2, \$300. Both together, \$850. Used few hours only, perfect. Herb Hollister, W0DRD, 709 Baseline, Boulder, Colo.

SALE: Complete 150 phone, 300 c.w. rack mounted station; push-pull 35TQ TVI-suppressed; separate power supplies, VFO, Electro-Voice mike, RME-69 receiver, complete set spare tubes for station. Best offer over \$200 takes all. Mike Geller, W3YAS, 68 Tanner Ave., Lexington Park, Md.

FOR SALE: 2500 watts, 110 VAC, gasoline generator Homelite, War surplus in gud condx, \$100. F.o.b. K. W. Covey, Mahanomen, Minn. CLEANING out. Send for list of transmitters, receivers, teletype, testing equipment and parts. W8GWA, 6204 Darranoor, Birmingham, Mich.

HALLICRAFTERS S-40B receiver, includes deluxe illuminated "S" meter, matching case, and antenna coupler; in excellent condition; best offer over \$75. Karl Thurber, 247 Hamilton Rd., Teaneck, N. J.

FOR SALE: NC-101X in excellent condx, \$70; Gonset 10-11 mtr. conv. \$10; BC 645, \$15; 90 watt final, \$15; want two meter trans. and xtal controlled conv. W2ZSL, Charles Copp, 3 West Drive, Fort Washington, N. Y. Tel. PO 7-2271.

LIKE new trade-ins: Collins 75A-1, \$275; RME-45, \$95; BC-221, \$99.50; Collins 30K-1, \$950; "A" Silver, never used, \$60; Mallory VP-552, \$19.95; Sky Buddy, \$29.95; Viking II, \$279.95. More! Write for list. Curle Radio Supply, 439 Broad St., Chattanooga, Tenn. 406 Meridian, Huntsville, Ala.

MOBILE high current Leece-Neville generator with rectifier harness and brackets, like new, \$80. F.o.b. Andrew Rau, Jr., 316 Carmita Ave., Rutherford, N. J.

SURPLUS items (to me). Viking II with FVO, \$250; three 33 ft. 61ST aluminum verticals with two heavy stand-offs each, \$150 each; Telrad 18A frequency standard, \$150. Will ship but prefer examination at station and pick-up. W1AXW, Richardson, 17 Whittier St., Dover, N. H.

FOR SALE: Hallcrafters S-76. Good condition, one year old. One hundred dollars (\$100.00). Herbert E. Russell, Suffield, Conn.

SELL: 32V-1, excellent, guaranteed, \$325; also SX-71, in same condx, \$135. C. B. Story, W7TGG, 54 Wyoming Ave., Sheridan, Wyoming.

SALE: Viking II, Viking VFO, NC-125 receiver, D-104 mike, Carter Dynamotor 600 V., at 240 Ma., Morrow 5BRLN converter, Master Mobile all bander coil, best offer takes all or each. Write Wayne Valentine, W5OAE, 300 E. Capitol St., Jackson, Miss.

FOR SALE: S40B, excellent condition, \$50. K2DZX, Phil Steinberg, 37 Morgan St., Bergenfield, N. J.

TELREX 3-element 20 meter beam, \$90; new 3E29, \$8; 832A, \$3; Guardian K-320 keying relay, \$2. Like new 10 watt, 10 meter phone, high gain speech. Two power supplies, \$40. 750 volt, 225 milliamper power supply, \$15. Exciter delivering 10 watts @ 40 to 20. Ideal 75 0-25 Ma, \$6; 3 inch 0-2RF amperes; \$8. W0GVS, 798 Sherburne St., Paul, Minn.

SALE: 32V-1, \$300; 75A-1, \$225, in excellent cond. W0OSX, 1396 West Idaho, St. Paul, Minn.

CLEANING house: Model 25-A teletype, \$30; Simpson 260, \$15.00; S-8 rcvr, \$25; T-3 mike with model G Stand, \$20; HRO-5T coils J. H. G., \$25. Equipment guaranteed. F.o.b. W. K. Lindeman, 211 Union St., Michigan City, Ind.

SALE: Radio Magazine 1937 thru 1941. Also some CO, QST, R9. Write to Clifford Storch, 5 Winfield Terrace, Great Neck, L. I., N. Y.

WANTED: HRO-7 or 50. Cash. Sell SX-9, \$30. W7GND, Barker, 305 Ash St., Pullman, Wash.

BARGAINS: WITH NEW GUARANTEE: R-9-er \$12.50; SW-54 \$29.95; S-38C \$35.00; S-40B \$79.00; Lyco 600S \$119.00; AT-27 \$99.00; SX-11 \$129.00; S-76 \$149.00; SX-71 \$169.00; SX-42 \$169.00; HRO-50 \$129.00; Eldico TK75TV \$39.50; Heath AT-1 \$24.95; HT-17 \$29.95; EX Shifter \$39.50; Globe Trotter \$49.50; Harvey-Wellis Delux \$69.00; Viking I \$179.00; Viking II \$229.00; SS-75 \$169.00; HT-9 \$139.00; Globe King 400B \$325.00; 32V1 \$375.00; 32V2 \$425.00; 32V3 \$525.00. Free trial. Terms financed by Leo, W0GVS. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

SELL: NC-125 receiver with matching speaker, new condition, \$125. W0YOP, 713 No. Huron Ave., Pierre, So. Dakota.

\$800 worth of surplus and 35 years accumulation of ham gear, hardware, tools, etc. \$300. W2CJZ, 90 Blvd., Bayonne, N. J.

WANTED: Amateur, and surplus electronic equipment; receivers, transmitters, teletype, radar, loran, technical manuals. Especially APR-4, ARN-7, ART-13, ARC-1, BC-610, BC-614, BC-939, DY-12, BC-221, BC-348, BC-312, BC-342, Collins receivers, transmitters, Cash, or trade for NEW Johnson Viking, Ranger, Central Electronics, Hallcrafters, Hammarlund, National, Elmac, Gonset, Morrow, Harvey-Wellis, Telrex, Fisher HiFi, Pentron, Bell, etc. Allerton, Box 100, Mass. Richmond 2-0048, 2-0916. (Stores: 44 Canal St., Boston, 60 Spring, Newport, R. I.)

CANADIANS! GR 10 receiver with speaker, S meter, xtal, filter, in gud condx, no alterations. One hundred dollars (\$100.00). Howard Walker, VESBN, Rosthern, Sask., Canada, care CNRR.

2 METER beams, 6 element, horizontal or vertical, all seamless aluminum. \$6.95 prepaid. Wholesale Supply Co., Lunenburg, Mass.

FOR SALE: Heathkit 30-watt xmtr, new tubes. In gud condx. Shipped express collect. A steal for \$19.00. Money order to be sent to: Mike Collum, W5FZV, 1158 Blair, Abilene, Texas.

STANDING Wave ratio bridge, SW-500. Hi-power type, leave in line up to 500 watts output, read SWR at all times while transmitting. Perfect for bandswitching rigs, antenna tuners. \$18.00 postpaid. With call letter \$19.00. Available soon, 6-meter equipment; CV-6 crystal-controlled converter, TX-6-75 75-watt transmitter. Write for free information. Send letters, checks or money orders to: Air-Five Company, W4WFW/9 Shulman and W9BMR, Box 335, Shullsburg, Wis.

FOR SALE: ARR-1 test oscillator (QST June 1952, 432 Mc. converter), \$3.00; 316As, QST Jan. 1949, 420 Mc. transmitter; 25¢ each; two for 45¢. Pair of Selsyns, C-78411, 50 v. 60 cycles, \$5.00. Cecil Baumgartner, Box #343, Milton, Pa.

SELL: Viking VFO, new, \$35.00. Want: Johnson Matchbox. Will trade. W2DJD, Art Rauch, 85 W. Main St., Smithtown, L. I., N. Y. WANTED: Adjustable frequency crystal holder for 75 meter xtal. W3EUN, Rogers Ave., Elliott City, Md.

FOR SALE: 3000V 120  $\mu$ fd oil-filled condenser, 55¢ net, 13 x 14 x 5 inches. \$35.00. Tom Beal, W8EYU, Grand Blanc, Michigan.

FOR SALE: COLLINS 32V3, in exc. cond. F.o.b. \$550.00. Morgan City, La. W5EKY, Broussard, Box 272, Morgan City, La.

TRAVELLERS portable television receiver for sale in luggage type carrying case. 22 tubes, new 7 in. picture tube. Built-in antenna. Channels 2 thru 13. No batteries. Postbox 520, Mar Vista, Calif.

WANTED: HQ-120X receiver. Malcolm Burdick, WINOO, Hampton, Conn.

TRADE: Fully equipped Rolleiflex camera. About a year old. Valued at \$500, for gud rvr as HRO-60, Collins 75A, etc. Write for details. Lou Desouenne, W1EAS, 753 Mendon Road, Woonsocket, R. I.

SELL: Teletype printers and accessories. HQ-140X, \$195; Dumont #241 "scope" \$275; AFN-9 with inverter power supply, \$250; 80-1 crystal calibrator with 200 Kc xtal, \$3.50; Meissner signal shifter, \$55; Viking Adventurer transmitter, \$39. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Phone Richmond 2-0916.

NEW YORK area. Sell Gonset "Commander" "3-30"; Mallory Vibrapacks: 6 to 300v., 200 Ma., 12 to 300v. 100 Ma.; Electronic Labs 6, 115 to 300v., 100 Ma., Shure mikes, 707A crystal, 505C rectifier, Biley crystal, 6AG7, 6L6 rectifier, VRI05-VRI50, 80 meter plug-in coils, 10 watt 10 meter phone mobile transmitter; Biley crystal 6AK6, 2E30, 2E30, 10 watt 115v. modulator, speech amplifier; 6SJ7-6J5-6N7 rectifier; 35 pounds of parts, most never soldered; 85 issues of QST, CQ, 1947-52; 30 x 60 green lineoleum topped table. Fixed price for all: \$250. S. Arms, W2SVW, Rye 7-1236.

SELL: Viking II VFO filter, \$285; Elmac AS4 \$85; HQ-140X, \$235. Burwell, 9 Fairview Place, Morristown, N. J.

12V Dynamos for late model cars, signal corps PE135AX, input 24-12V, output 500V 400 Ma., size 13 x 12 x 7, original packages, spare parts: \$20 postpaid, refund if not satisfied, Lesterman Co., Barbourville, W. Va.

I want to buy set of coils for National FB7 receiver. W7MID, 4511 North 8th St., Phoenix, Ariz.

WANTED: TVI-suppressed transmitter and receiver. W. Ellis, 1240 Burke Ave., Bronx, N. Y. C. KN2MKW.

BEST Offer! Hallcrafters SX-71 dual conversation, xtal, etc., rcvr & spkr. In excellent condx; Elmac AS4H xmtr (10-11-20-40-80) 110 AC supply with matching cabinet; A xtal mike. A 425 volt 200 Ma. 6 volt D. C. Vibrapack. Very compact and new. A new model 4A10 Wilcox Gay tape recorder, dual speed, with extras and mike. Only used several hours. Total value \$580 plus. Let's hear your offers, fellows. George Moore, W3PFD, 337 13th Ave., New Brighton, Penna.

REARXIN! BC348M with S-meter, converted to 110 VAC and Q5'er; both in gud condx: \$75. Guy J. Mallard, Jr., 1433 Belvedere Ave., Jacksonville, Fla.

HICKOK Model 288X crystal controlled signal generator; very gud condx: \$65.00 express collect. N. B. Heidenblad, K2CBR, 55 High Road, Baldwinville, N. Y.

SELL: New and used Gonset mobile equipment, two and six meter communicators, etc. I buy, sell and trade mobile gear. Will take gear in trade for new Polaroid cameras and accessories. Graham Co., R. T. Graham, W1KJT, Box 23, Stoneham, Mass. Tel. ST 6-1967.

\$59.95 can provide you with 75 watts input on all c.w. bands (160-10) \$14.95 more will put you on phone! Details free! Hart Industries, 467 Park, Birmingham, Mich.

WANTED: "Radiola IV", "Radiola 16", "Radiola 25" "Radiola Grand"; Kolster Decrimeter and Pacent SLF condenser. Will pay cash. Donal Eymard, 140-35 58th Road, Flushing, L. I., N. Y.

NATIONAL NC-88 receiver, in gud condx, \$80; BC-459A, excellent condx: \$12.00. K2GLR, Tom Powers, Mt. Kemble Lake, Morristown, N. J. Tel. Bern 8-1293M.

HQ-129X Hammarlund, clean and in excellent condx: \$135; two BC459A were bought new, used as VFOs or transmitters, \$7.00 each. Following from estate of W1CS: 1100 power supply with 866s, 60 watt mod. and speech amp, with power supplies in chassis and panel; meter, etc. etc. etc. standard 100-1000 Kc. Multivibrator, modulator. Also meters, transformers, switches, resistors, carbon mikes, etc. W1ASU, Green, 112 Barnard Rd., Worcester, Mass.

FOR SALE: Hallcrafters SX-99, in new condx, \$120. Alan Steger, KN2JYH, Box 97, Huntington Station, N. Y.

GONSET Communicator 2, new, never used: \$150. Harvey-Wellis Delux and power supply, seven months old: \$130. Will ship. Stan Dobrowski, Jr., K2BHX, Atlantic Reserve Fleet, Sub Grp 3 Et Div, Green Cove Springs, Fla.

SELL: National NT300 Class B modulator, less Varimatch transformer, with PP TZ40, \$30; NT1200 power supply for same, \$65; Par-Metal enclosed rack, including roller platform, 72" x 19" panel space; 40. UHX10 transmitter with all coils, xtals, AC power supply, \$40; G. R. Variac, 15.0 A., 2 KVA, \$25; LM4, with modulation, calibration book, \$100. Will not ship. W2AHC, 43-12 Douglass Parkway, Douglass, L. I., N. Y.

Bargains with new guarantee and completely reconditioned: S38 \$29.00; S40A \$69.00; S40B \$79.00; S 76 \$129.00; SX71 \$169.00; SX62 \$199.00; NC98 \$119.00; HRO60 \$119.00; VHI152A \$49.00; TBS0D \$69.00; Moser EX \$39.00; Viking Ranger \$199.00; Viking II \$239.00; Viking VFO \$39.00; Viking Mobile \$79.00; Hq129X, SP400X, NC125, NC183D, NC240D; HRO60, AE88, 75A1, 75A2, 75A3, 32V1, 32V2, 32V3, KWI, PMR6A, AF67, Super 6, Commander, BKW \$100; many others cheap. Shipped on approval. Easy terms. Satisfaction guaranteed. List free. Henry Radio, Butler, Mo. \$50 takes T-60 Meck 60W. phone/c.w. 40-80 VFO coils, 80-10 meters. 3 crystals, complete. You pay freight. W8ENX, Harold R. Meldrum, Grand Marais, Mich.

SELL: HT-18, \$50; BC-221 calibration book incl. \$75; Motorola final and power supply (write for details) \$75; MB-150, \$15; meters, Trip-lett; 0-500 mil; 0-250 mil, 0-100 mil, 0-1 mil, Westinghouse, 0-2500 volt; 0-1 amp; 0-1.5 amp, G-E; 0-500 mil. All for \$25.00. W2DEX, H. A. Sherman, 250 College Ave., Elmira Heights, N. Y.

WANTED: One or two complete sets or single reels for use with TG-10 Tape Puller. Tape must be in good condition. W3ZFM, Zillger, 430 Anthony Rd., Narberth, Pa.

MOBILEERS! Send now for your free copy of Mobile Antenna Design. We cater exclusively to supplying the needs and solving the problems of the mobile ham. Write to Skyline Electronics—Ham Division, 5835 W. Chicago, Chicago 51, Ill.

TELETYPE: Model 12 page printer, receiving distributor, table, cover, box of paper. Will trade with cash for Gonset Communicator. W7OSV, 4826 Memory Lane, Salt Lake City 7, Utah.

2, 6, 10, 15 & 20 meter beams. Aluminum tubing, perforated sheets for shielding. Kadeliff's, Fostoria, Ohio.

NEW RTA1B, FL8 audio filters, two for \$2.00 prepaid in U. S. A. FT154 shock mounts for BC348, \$2.00 each; BC614 speech amplifier, 1C/A-21-200 Pansaptor, BC638A frequency meter, 100-156 Mc. Will sell or trade for audio equipment or tape recorder. M. D. Haines, W5QC B, 1316 S. W. Military Dr., San Antonio 4, Texas.

POWER supply items, chokes, xfmers, condensrs, heavy duty stuff. Many other items. Cash or trade. Stamp for list. Want: audiogenerator, low pass filter, TV rotator, scope. W2NEK, Jaray.

BALUN coils, B&W #3975, chassis mounted and wired \$12.95, plus postage; large inventory used equipment due liberal trade-in policy, write for latest list to W1BFT; a few examples follow: Bud VFO-21 \$24.95, Sentra 10A \$99.95, Collins 12V3 \$55.00, Deltronics CD-144 \$99.95, Eldred TR-75TV \$39.95, Elmac A-54H \$110.00, Gonset Tri-Band \$29.95, Hallicrafters HT-18 \$59.95, Hammarlund 4-20 \$44.95, Harvey-Wells TBS-50D \$79.95, Johnson Viking II \$265.00, Lysco 650 \$69.95, Meissner EX \$44.95, Millen 90800 \$19.95, National NC-125 \$125.00, RME VHF-152 \$49.95, Simson 480 \$299.95, Sola \$24.95, Telvar 1-60-2 \$69.95, Triplett 2413 \$27.95, UTC PA-126 \$10.50, Evans Radio, Concord, N. H.

TRADE or sell: Eico 6 v. eliminator, Heath TC11D; BC453 Navy version; unmodified, new; 2 PE101C modified, new; Delta 11" lathe, all accessories, hench, jack shaft, less motor. Want: DB23, HQ129X, S76 or what have you? M. Marshall, 455 Washington Ave., Dumont, N. J.

FOR Sale: New parts, original packages: UTC S-48, S-61, S-57, S-37; Bud 500 Watt and 50 watt coils; tubes, etc. for final, QSTs; October 1937 through June 1950; radio books. Best offers. Send for list. Robert H. Cushman, 12 Carver St., Plymouth, Mass.

FOR Sale or trade: Eicor 1000 tape recorder, \$75; Cascade disc recorder radio-phon, \$50; Shure 55-S microphone \$35; Adler portable mill, \$25; V-M 3-speed record-changer, \$20; Sprayberry radio course, \$20; Alliance BB-2 television booster, \$5; T-17 carbon mike, \$2.50. All items guaranteed in excellent condition. Priced F.o.b. V. R. Hein, 418 Gregory St., Rockford, Ill.

SELL: Viking I, TVI-suppressed, HQ-129, Millen R9'er, "Williamson" Hi Fi amplifier, \$22 transmitter with deluxe supply, mobile body mount, parts, tubes, Peter Rosenbaum, W2GAW, 41-26 73rd St., Jackson Heights 77, N. Y.

BIG Rig for \$200.00. 1 Kw input, 810-S push-pull final, 805-S Class B modulators; Stromberg-Carlson speech amplifier; Millen exciter and oscilloscope; high voltage power supply Variac controlled; 2-66 in. Par-Metal racks. Sell for almost price of tubes. D. W. Keefe, W2MFS, 37 Highridge Rd., Hartsdale, N. Y. Tel. SCarsdale 3-5149.

Will sacrifice my factory-built Viking II with VFO model 122, in perfect condx, \$250. F. o. b. Monrovia, Calif. Manuals included. W6GMC, Smith, 614 Bradbury Rd., Monrovia, Calif.

NATIONAL NC-183 receiver, NFM-83, speaker, recently factory serviced, \$200; VHF-152 converter, factory serviced, \$45.00; DB22-A pre-selector, \$55; MB-1 boomrange cw tone monitor, \$20; Select-O-ject, power supply, \$20; Collins 310B-1 exciter/VFO, all bands, \$175; Meissner signal shifter, plug-in coils, TVI-suppressed, \$22.50; Navy Command xmitter, 2.1-3.0 megacycles unmodified, \$12.50; Cardwell BC221-Q frequency meter, VR supply, \$65; miscellaneous tubes, meters, filter condensers, parts. Above guaranteed top condition, factory manuals furnished. F.o.b. Indianapolis. Trade L. C. Smith No. 5 mill toward Johnson Matchbox or Dixieland Jazz records, tapes. All mail answered. Phone WAInut 4-2184, W9DPL, Howard Severeid, 2431 East Riverside Dr., Indianapolis 23, Ind.

TRADE: Argus C-4, 35 mm camera, 2.8 lens, flashgun, leather carrying case, all new and in original carton and Hallicrafters S20R revr in gud condx for Hammarlund HQ-129X in A-1 condx. K4BGG, Joe S. White, 5892 Lemon Ave., Long Beach, Calif.

FOR Sale: Collins exciter 310B-1, coils, instruction book, \$185; frequency meter BC-221-N, spare tubes, crystal, AC power supply, \$60. A excellent. R. C. Litter, W8JRG, 640 Snowhill Blvd., Springfield, Ohio.

MARINE crystals, new, guaranteed; heavy duty types. All channels in singles or sets. Specify frequencies and socket pin dimensions. Transmitting \$2.95, receiving \$2.50. C-W Crystals, Box 2065, El Monte, Calif.

A Steal! 4-element Q-Master 20-meter shortbeam, also for 11 meters, used 2 weeks. Cost \$120 plus. Sell for \$70. W2LEB, 13 Shepard Pl., Nutley, N. J. NU 2-7552.

NOVICES: TBS-50-D and power supply, in good condition, \$140. Ian Underwood, 265 Grace Church St., Rye, N. Y.

10A SSB exciter modified per November 1953 QST including 20-40-80 meter coils, two crystals, and QT-1. Excellent condition. Best offer F.o.b. New Orleans. Want QSTs before 1930. Wayne Cooper, YN1WC, 12 Calle 6-21, Guatemala City, C. A.

VERTICAL antenna for 20-40-80 M. All material and information included. \$59.50. No C.o.d. El Cajon Electronic Engineering, 720 S. Johnson Ave., El Cajon, Calif.

SELL: Receivers HQ-120X, \$75.00; National NSD100, general coverage, \$50; RME VHF2-11, \$65; Triband converter, \$25.00; transmitters TBS50C, \$65; Subraco MT15X, \$35.00; Elmac A54 speech and modulator modified, \$70. Two Link police car transmitters with dynamotors at \$40.00 each. Want: 75A3 or modified 75A2 with mechanical filter. Anybody able to hatch a deal with any of this? W2ADD, Paul Reveal, 129 Midland Ave., Glens Ridge, N. J.

WANTED: Micro-Match for 72 ohm coax and 75-100 watt Multi-match modulation transformer. Walden Holl, W3UDW, 538 Luzerne St., Johnstown, Penna.

VIKING 1, VFO, TVI-suppressed, S-40B, accessories: \$350. K2DQH, Chris Lane, North St., Harrison, N. Y.

FOR Sale: Complete Motorola T69-20A mobile 10-meter xmitter. Also Motorola fixed frequency receiver with converter. All controls, cables, everything from mike to antenna. \$100. Will consider separating. W9GBS, Schachte, 6020 N. Neva, Chicago 31, Ill.

COLLINS 32V-3 in excellent condition with 4D32 spare: \$450 F.o.b. Bristol, Conn. W1AYR, A. B. Nelson, 350 Fern Hill Rd., Bristol, Conn.

WSAXI/MM correct mailing QTH Arthur E. Hutchins, R/O SS Fullerton Hills, Bernuth Lembcke Co., 420 Lexington Ave., New York 17, N. Y.

## DEAR FELLOW AMATEUR:—

*"A very serious situation has arisen. Unless all of us amateurs act quickly, a law will be passed in Washington which will wipe Amateur Wireless completely out . . ."*

Thus in 1918 a four-year-old ARRL, already the guardian of amateur radio in regulatory matters, wrote each amateur in the United States, trying to prevent the extinction of "amateur wireless."

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**\$5 elsewhere**

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 West Hartford 7, Conn.

# Designed for



# Application



90801

## The No. 90801 EXCITER-TRANSMITTER

The No. 90801 Exciter-Transmitter is of the most modern design including features and shielding for TVI reduction, band-switching for the 4-7-14-21 and 28 megacycle bands, circuit metering. Conservatively rated for use either as a transmitter or exciter. 5763 oscillator-buffer-multiplier and 6146 power amplifier. 90 watts input for CW. Can be keyed in the oscillator and/or amplifier or by means of keyed external V.F.O. such as the 90711. 67 watts input phone. Rack mounted 3½" panel height.

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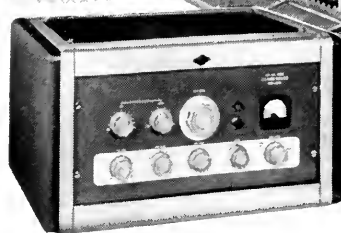
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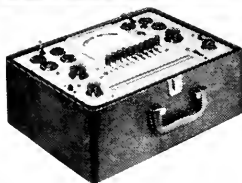


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Inside the Gonset Type 500-W rf power amplifier. Note the 4 RCA-807's in parallel.

# LEADING AMATEUR DESIGNS

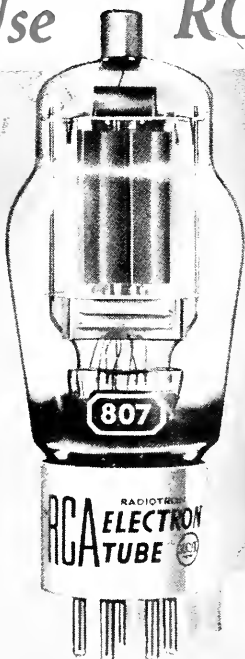
... Use *RCA Power Tubes*

Take Gonset's Model 500-W power amplifier, for example.

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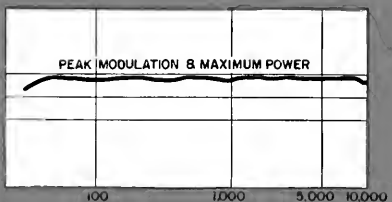
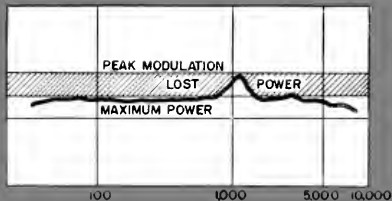
**The 664 will equal a useful power increase of four times over commonly-used peaked microphones, and could well be the best investment, dollar-wise, in your shack**

Here is a totally new concept in microphones for amateur phone communication.

The cardioid (high directivity at all frequencies) pickup pattern enables you to have a *real* "arm chair QSO." The forward gain of 5 db\*\* allows you to speak at nearly twice the distance you have been working to a conventional microphone. Unwanted sounds in the shack are rejected nearly twice as effectively as by ordinarily-used non-directional microphones.

The response curve is tailored to put the highest degree of intelligibility on your carrier. Your 100% modulation is all speech . . . in full character . . . with bite and punch. This curve, compared to ordinary microphones, will give you up to 12 db more usable audio—without splatter or hash.

We invite you to prove to yourself that the 664 will outperform your present mike by a direct comparison. If it doesn't out-hurdle QRM, your distributor will refund the purchase price without qualification.



A peak in the response curve limits modulation to the peak value. A peak-free response brings the full power level to 100% modulation gaining an intelligibility increase equal to the peak in the average mike. The 664 is peak-free and gives the highest usable power of any microphone for AM, NFM and SSB.

New Variable D\* Dynamic Microphone operates on the principle of multiple sound paths to the diaphragm. Spaced apertures to the rear of the diaphragm are phased to provide cancellation of rear sounds and give full response to sound from the front.

This new principle enables the curve to be free from peaks or dips. Insures freedom of blasting and boominess from close talking. Eliminates effect from mechanical shock. High level -55 db. Acoustalloy diaphragm. Switch easily changed to relay control, if desired. Absolutely unaffected by moisture, humidity, or temperature.

Model 664, Without Stand.....Net Price: \$47.70  
Model 419, Desk Stand.....Net: 9.00

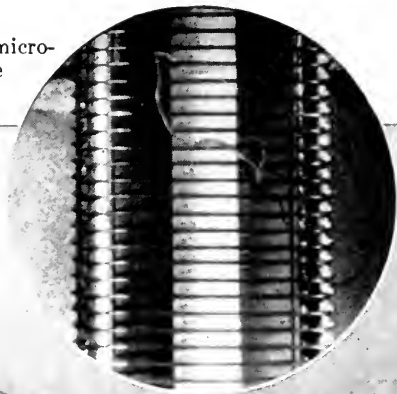
\*\*Forward gain is that compared to a pressure mike; actual front-to-back hemisphere pick-up ratio is 20 db.

\*Patent Pending

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or write for Specification Sheet

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● Right: the "why" of G-E "Operation Snow White". Unretouched micro-photograph of tube grid, shows a strand of lint which can easily cause an inter-electrode short-circuit. Dust particles have similar effect.



● Glass-paneled hoods for General Electric 5-Star Tube assembly and microscope inspection, assure working conditions of optimum cleanliness. Employees wear rubber finger cots,

to avoid contaminating tube parts with dirt or moisture. The entire "Snow White" area is air-conditioned and pressurized, and all garments are made of lint-free Nylon and Dacron.

## G-E "Operation Snow White" further increases 5-Star Tube high reliability!

Inoperatives among 5-Star Tubes have been cut two-thirds by measures G.E. has taken to provide lint-free, dust-free assembly and inspection. 100% 5-Star factory tests prove this gain in *built-in* tube dependability.

Most tube inoperatives are the result of intermittent "shorts" from lint and dust. G-E "Operation Snow White", by means of pressurized, filtered, and de-humidified air, plus numerous other steps to accent working cleanliness, cuts down on short-circuits at the source. Result: 5-Star Tubes are the most trust-

worthy types that you can install!

Use them in civil-defense work, where dependable communications are a "must"! Specially designed, built, and tested, they're your foremost protection against rig and receiver failures.

Your G-E tube distributor stocks 5-Star high-reliability tubes. See him for full information! *Tube Department, General Electric Co., Schenectady 5, N. Y.*

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**FOR RADIO AMATEURS**

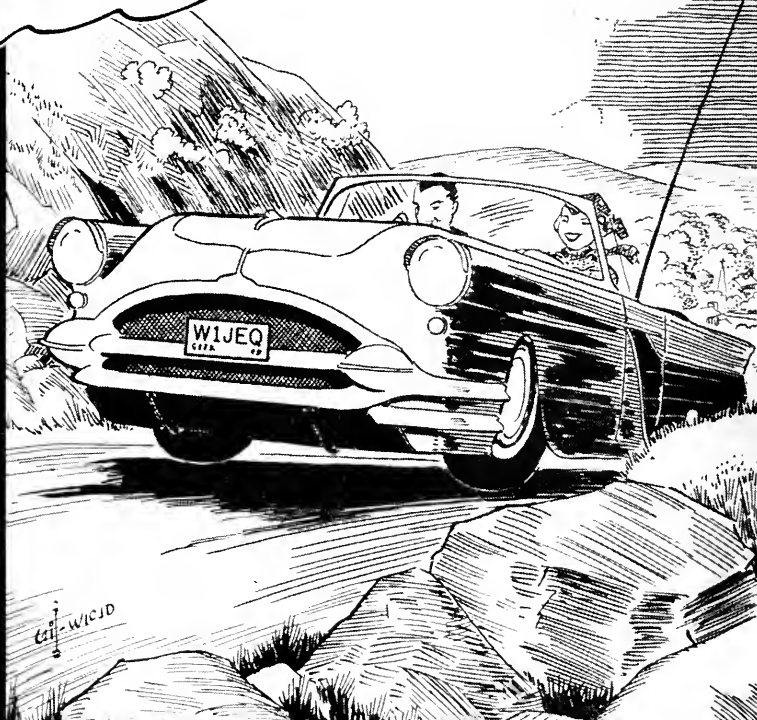
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# why is the SX-96 the most wanted receiver on the air?

The Hallicrafters double conversion selectable side band receiver offers major improvements in stability by the addition of temperature compensation in the high frequency oscillator circuits and the use of crystal controlled second conversion oscillators. Hallicrafters highly selective 50 kc i-f system is used in this new precision-built receiver.

**Coverage:** Standard Broadcast, 538-1580 kc; Three S/W Bands, 1720 kc-34 Mc, Band 1: 538 kc-1580 kc-Band 2: 1720 kc-4.9 Mc-Band 3: 4.6 mc-13 mc-Band 4: 12 mc-34 mc.

**Type of Circuit:** Double conversion superheterodyne over the entire frequency range.

**Type of Signals:** AM-CW-SSB.

**Features:** Precision gear drives are used on both main tuning and band spread dials. Double conversion with selectable crystal controlled second oscillators. Selectable side band reception of both suppressed carrier and full carrier transmissions by front panel switch, delayed AVC, CW operation with AVC on or off. Calibrated bandspread, "S" meter, low drift, double conversion superhet.

**Controls:** Sensitivity, band selector, volume, tuning, AVC on/off, noise limiter on/off, AM/CW-SSB, Bandspread, selectivity, pitch control, response (pwr on/off, LSB, USB-2 tone pos.), receive-standby.

**Intermediate Frequencies:** 1650 kc and 50 kc.

**Tuning Assembly and Dial Drive Mechanism:** Separate 3 section tuning capacitor assemblies for main tuning and bandspread tuning. Circular main tuning dial has 0-100 logging scale. Bandspread dial is calibrated for the 80, 40, 20, 15, and 11-10 meter amateur bands.

**Selectivity:** Five steps of bandwidth calibration at 6 db points; 5 kc, 3 kc, 2 kc, 1 kc, and .5 kc.

**Antenna Input Impedance:** Balanced/unbalanced.

**Headphone Output Impedance:** Nominal 500 ohms.

**Audio Output Impedance:** 3.2/500 ohms.

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**External Connections:** 3.2/500 ohm speaker terminals, terminals for single wire or doublet antenna, phono jack, AC power cord, socket for DC operation and remote control, audio output terminals, "S" meter electrical adjustment and mounting hole for co-axial cable connector. Phones jack on front panel.

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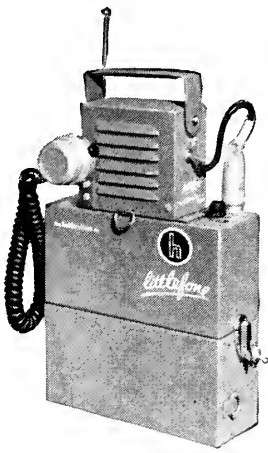
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## Section Communications Managers of the ARRL Communications Department

**Reports Invited.** All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. *All amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

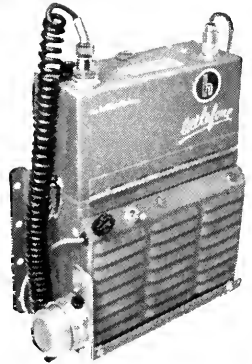
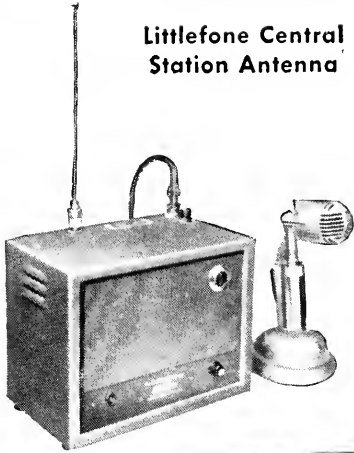
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# THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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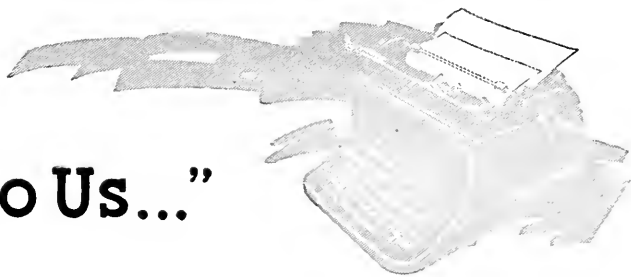
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# "It Seems to Us..."



## ELECTIONS

Our frequent contention that amateurs are pretty much a cross-section of the population is borne out in yet another way by comparing the percentage of votes cast in ARRL director elections with those of national political elections. Over the past six U. S. Presidential elections the national vote has ranged from 51 to 62.7 per cent, while in the League's director elections the vote, in the past five years, has ranged nationally from 53 to 59 per cent, with some division votes as low as 48, and some as high as 65, per cent of those eligible. These figures show that, by and large, amateurs are as interested in the affairs of their organization as citizens generally are in national affairs. This, to us, is a sign of the strength of the organized amateur movement, and speaks well of amateurs as a group.

But curiosity moves us — what happens to the other forty per cent? Have they an active interest in League affairs? Do they realize that the ARRL directors are the people who make the long-range plans and decide policy matters for all League members? . . . that men of judgment and wisdom are needed? If they did, it would seem that the vote would be nearly 100 per cent, for all would be anxious to choose the man they believe most qualified for the director position.

The usual reasons why one may not be able to cast a ballot in a political election don't often operate in League elections. Transportation to the polls is no problem — the ballot-box is your mail box. The difficulty in obtaining absentee ballots doesn't apply — all our votes are "absentee." Temporary absence from town on business won't stymie you — the voting goes on continuously from October first to November twentieth.

One more thing is important — you can't vote for the man you think best if his name isn't on the ballot! Don't leave it to someone else — if you have someone in mind you believe has the qualities and qualifications of directorship, get up a nominating petition signed by ten or more Full Members, and send it into the Secretary before the 20th of September.

Let's make a new record for participation in this autumn's election in the Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern Divisions. Full details are on page 50.

## MOBILE MANUAL

League Hq. takes pleasure in announcing the preparation of a new publication, *The Mobile Manual for Radio Amateurs*, another addition to the ARRL Radio Amateur's Library. Now printing, it will be available sometime in August.

Like its slightly older brother, *Single Sideband*, the mobile manual is another demonstration of the thorough coverage *QST* provides in a specialized field, in this case mobile — for nearly all the material has come from the pages of our monthly journal over the past few years. The result is what you might expect — a veritable encyclopedia on mobile techniques — design, construction, installation and operation.

## Q-R-MARY

One of the most important and useful tools of the voice operator is phonetics. When conditions are rough and readability is poor, the use of phonetics can be the difference between communication and no communication. It seems to us, however, that sometimes we carry it to extreme.

In identifying your call sign, by all means use phonetics — anytime. But when a 'phone signal is Readability 5 (and except in DX, whoever heard a lesser report?) the only other reason to use phonetics is something like transmitting a trick word, or the address of a message. Yet you've heard many an R5 voice saying, ". . . here in Schenectady, S-Susan, C-Charlie, H-Henry. . . ." Or it might be Philadelphia or Detroit, Springfield or Milwaukee. Or simple operator names like Joe and Bill. There's no need for such phonetics unless your name is Zzyynsklf or unless you live in Bfftsplk Park.

Queen-Roger-Mary and Queen-Tare-Charlie are other cases in point. It has always been a source of amazement that so many of us



install a modulator for the enjoyment of voice communication, and then continue to use abbreviation methods which were designed for telegraphy and never would have come into existence without their need in telegraphing. "QRM" is for the c.w. operator, to save his time in otherwise having to spell out "interference." Voice frees the operator from the need for such abbreviations. 'Phone is much too useful a system of communication to be burdened with techniques designed for an entirely different mode. Say it with words!

## A.R.R.L. ROANOKE DIVISION CONVENTION

*Old Point Comfort, Va. — August 12th, 13th and 14th*

The ARRL Roanoke Division Convention is jointly sponsored this year by the Peninsula Amateur Radio Club and the Tidewater Mobile Radio Club. Convention Hq. will be the Chamberlin Hotel, Old Point Comfort, Virginia. Registration will begin Friday at 5 P.M., followed by a general get-together and dancing in the exclusive private Chamberlin Room Club. On Saturday there will be outstanding speakers on single sideband, antennas, and other subjects. There will be forums on 'phone and c.w. nets, DX round-up, single sideband, MARS, Navy, TVI, RACES and AREC. At the banquet there will be no long speeches but lots of entertainment.

For those who have small children, the hotel will place cots in your room at no additional cost. There will be special programs for children under supervision of trained personnel; also a private dining room for the children during the banquet so that you may be free to enjoy your meal. We hope to have baby sitters that may be employed at the prevailing rates to free you for an evening of dancing.

There will be trips for the ladies to Williamsburg, Jamestown, and Yorktown. A salt-water outdoor pool and a beach are available on the hotel grounds.

Registration fees as follows: full convention privileges, including banquet and dancing, \$6.00; Novices under 20 years of age, \$4.00. There is a special rate of \$10.00 for the OM and XYL. Hotel rates, \$5.00 single, \$8.00 double, and up.

The convention committee feels that you will enjoy and long remember your stay at this wonderful hotel and its Southern hospitality, with its wonderful food, outdoor salt-water pool, beautiful rooms and views overlooking Chesapeake Bay and Hampton Roads.

Reservations should be sent to Jefferson H. Walker, W4AAD, 27 River Road, Warwick, Va.

Hotel reservations should be sent to The Chamberlin Hotel, Old Point Comfort, Va.

### COMING A.R.R.L. CONVENTIONS

**August 12th-14th — Roanoke Division,  
Old Point Comfort, Va.**

**September 3rd-4th — South Dakota  
State, Yankton, S. D.**

**September 30th-October 1st-2nd —  
Southwestern Division Convention,  
San Diego, Calif.**

**October 15th-16th — Central Division,  
South Bend, Ind.**

**October 22nd-23rd — Midwest Division,  
Omaha, Neb.**

## **Strays**

The somewhat dubious honor of being the first ham to cause TVI may belong to Tom Marshall, W5RFF. Here's his story: "Back in 1936 or '37 New Haven, Conn., was celebrating its 300th birthday, and I set up a ham station at a booth in the armory. Among the exhibitions was a demonstration of television by the Baird outfit — scanning disk, neon-bulb receiver, and so on. During one of the TV shows the director came screaming out of the darkened tent and made straight for the ham station — yep, we were taking his picture out! To keep peace, we installed a push-button at the TV demonstration and a red light at our station, so when the light went on we stayed off."

As W5RFF says, "What a claim!" But it's probably another ham "first."

— ... —

Here's another one for the "What's in a call?" department: WN1FEM is a YL, Elizabeth M. White, New London, Conn., but W1MRS, Ralph Saija, Brookline Mass., is an OM!

— ... —

Ironie, isn't it? Sir Robert Watson Watt, the noted radar pioneer, was fined twelve dollars by Kingston, Ont., authorities for speeding. The police had clocked his car — with radar!

— I.R.T.S. News

— ... —

W5RFF has been using the multivibrator circuit of Dudley's 50-ke. frequency marker (p. 14, March, 1955, *QST*) to get 10-ke. intervals, the only change from the original circuit being to substitute 500- $\mu$ f. silver micas at  $C_{10}$  and  $C_{11}$ . The multivibrator locks readily with crystals ranging in frequency from 100 to 600 ke. (at even 100-ke. intervals, of course, for 10-ke. output).

— ... —

W. Bert Knowles, VE3QB, for 22 years ARRL's QSL Manager for all VE3s, was recently the victim of a fatal accident.

From the inception of the present system of Bureau Managers, in August, 1933, Bert had served the hobby he loved so well. There is no question that the major portion of his hobby time was devoted to the tedious job of handling DX QSLs for fellow hams. Bert Knowles' ham career is an outstanding example of unselfish service to the fraternity.

## OUR COVER

The diminutive unit shown on this month's cover is a streamlined modern version of the "Little Gem" which appeared in *QST* almost a decade ago. This new measuring device features compactness, simplicity and versatility. For more information see "The Transistorized 'Little Gem'" by *QST* Technical Assistant E. Laird Campbell, W1CUT.

# An Improved Antenna Bridge

*Increased Accuracy and Convenience in Impedance Measurements*

BY R. WADE CAYWOOD,\* WIKRD

• Most earlier designs of simple variable-impedance bridges for antenna and other r.f. impedance measurements have been open to serious objections because of inherent inaccuracies. Described here is a circuit that overcomes these objections and offers greater convenience in operation. Also described is a balun of novel construction for eliminating errors in measurements on balanced lines and loads.

It is often desirable to determine the resistance and resonant frequency of an antenna, to check the standing-wave ratio on a transmission line, to find receiver-input impedance, and to make many other r.f. impedance measurements. The antenna bridge described here offers an improved means for making these measurements, and at the same time is simple in design and easy to construct and use.

Fig. 1A is the fundamental circuit of a standard Wheatstone bridge. Fig. 1B shows two adaptations of the Wheatstone bridge for radio-frequency measurements; the similarity between these diagrams and the basic d.c. resistance bridge is obvious. In the development of such bridges, a subsequent step was that of using the adaptation in Fig. 1B to make a fixed-impedance standing-wave-ratio bridge. The schematic circuit diagram of such a bridge is shown in Fig. 3C.  $R_4$  can be a 51-ohm carbon resistor for 50-ohm coaxial line. The two ratio arms consisting of  $R_2C_2$  and  $R_3C_3$  are identical so that the bridge unbalance is minimum when the impedance connected to the output jack is equal to 51 ohms and is a pure resistance. If the impedance differs from 51 ohms the meter reading will not be zero and the instrument can be calibrated either in terms of impedance or standing wave ratio. However, at impedances other than 51 ohms, the accuracy of measurement frequently is not too good.<sup>1</sup>

In an attempt to avoid being restricted to a fixed impedance, bridges have been made using a potentiometer in one arm. This seems like an obvious solution, but there are several disadvantages to this type of bridge. Principally, there

is a substantial frequency error because a potentiometer is not a pure resistance but a combination of resistance and reactance, and as the arm of the potentiometer is moved, the ratio of resistance to reactance changes. Hence the accuracy of measurement is relatively poor and the calibration depends on frequency. Thus the substitution of a potentiometer in the simple fixed-resistance bridge is not too good a solution.

A disadvantage of bridges using all resistance arms is that the r.f. power requirements, while not large in terms of watts, are often greater than can be supplied by a grid-dip meter. It therefore becomes necessary to use a transmitter to supply the power, but since even a low-power transmitter generally has an output sufficient to overload the bridge components, some provision must be made for reducing the power to the proper level. A grid-dip meter would be a more convenient power source.

A circuit suggested by S. W. Seeley, W2ZE, offers the possibility of very considerable improvement in both respects. In this arrangement a differential capacitor supplies the variable components of an adjustable-impedance bridge, and since capacitance can be measured much

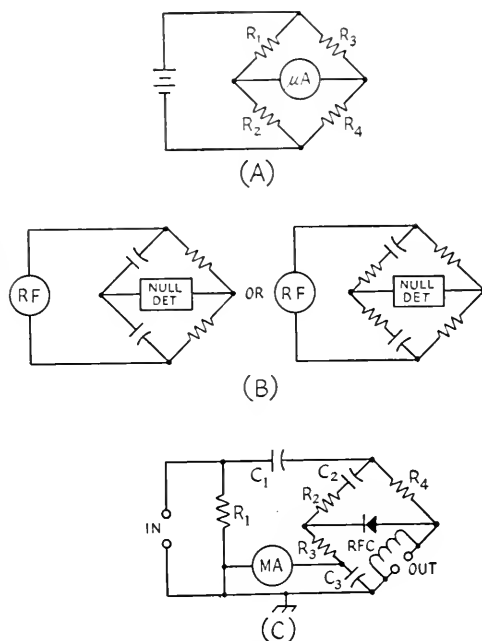


Fig. 1—The basic Wheatstone bridge (A) and adaptations (B) for r.f. use. (C) is a typical practical circuit for a bridge with fixed-resistance arms.  $C_1$ ,  $C_2$  and  $C_3$  in this circuit are blocking capacitors.

\* Chief Engineer, James Millen Mfg. Co., Malden, Mass.

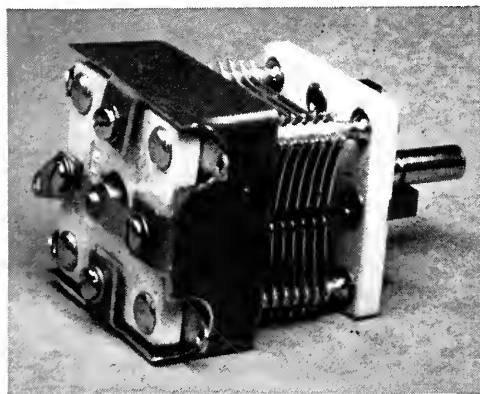
<sup>1</sup> This is partly because the accuracy of such a bridge tends to decrease, as a practical matter, with an increase in the ratio of the impedances in the unknown and standard arms. Also, as has been pointed out many times in *QST* and the *Handbook*, for accurate measurement it is essential that the indicating circuit have good linearity and extremely high impedance compared with the bridge impedance, and that the r.f. input voltage be maintained constant when the load is disconnected or short-circuited for the reference voltmeter setting. — Ed.



The simplicity of the bridge is evident from its appearance. The unknown impedance to be measured is connected to the coaxial jack on the side, and r.f. from a grid-dip meter is coupled to the loop at the left.

more accurately than resistance at r.f., and can easily be kept "pure" at ordinary frequencies, a high order of bridge accuracy becomes possible. A differential capacitor is a dual capacitor so arranged that as the shaft is turned the capacitance of one unit decreases by the same amount that the capacitance of the other increases; in a bridge, the two capacitors become the variable ratio arms. The practical form of W2ZE's circuit is shown in Fig. 2, where  $C_1$  is the differential capacitor.  $C_1$  does not use up any of the r.f. input power, and when a microammeter is used as an indicator, the circuit will operate well from a grid-dip meter source even with loose coupling.

The only fussy part of the bridge is the differential capacitor. For compactness and reduction of stray effects this capacitor, like the one shown in the accompanying photograph, should be designed especially for the purpose. Two identical single capacitors, ganged together so that one is at maximum when the other is at minimum capacitance, may be usable; however, the frequency error will be greater even though the assembly is kept as compact as possible to minimize stray inductance.



The differential capacitor which is the heart of the bridge circuit. The copper shielding fastened to the rear end plate is to prevent stray coupling to other components in the bridge.

## Construction

The photographs show the construction of a bridge built to W2ZE's design. As can be seen by looking at the inside view, the unit is not at all complicated; however, it is advisable to stick to the suggested components and layout. Obviously it is undesirable to have unnecessary lead inductances or capacitances between bridge arms. As shown in the inside view of the bridge and in the photograph of the differential capacitor, a copper shield is placed around the top part of the capacitor to shield the stators from the other elements of the bridge. Since the calibration accuracy at the upper end of the frequency range is limited by stray capacitances between bridge elements, the addition of this shielding raises the upper frequency limit at which the bridge maintains its accuracy. With the shield around the condenser the frequency error is very small up to at least 50 Mc.

The choke in the bridge is a miniature powdered-iron-core layer-wound solenoid. The lead

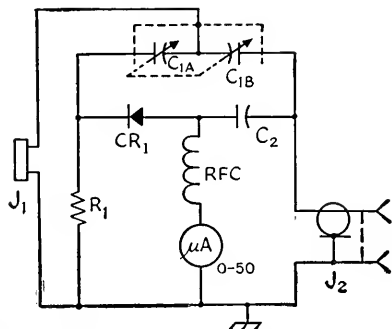


Fig. 2 — Bridge circuit using differential capacitor for adjustment of impedance ratio.

$C_1$  — Differential capacitor, 11–161  $\mu\text{f.}$  (Millen 28801).  
 $C_2$  — 0.01- $\mu\text{f.}$  disk ceramic.

$R_1$  — 51 ohms, 2-watt composition, 5% tolerance.

$J_1$  — Crystal socket.

$J_2$  — Coaxial connector.

RFC — Miniature choke, 200  $\mu\text{h.}$ , iron core (Millen J300-200).

CR1 — Germanium diode, 1N34A suitable.

between the coaxial input connector and the capacitor is a short piece of flat copper ribbon. Any revision in the layout that results in longer leads will tend to result in increased frequency error.

The Type 1N34A germanium diode was used because it is satisfactory and because it is generally available. Other types should be equally satisfactory, however.

R.f. is introduced into the bridge circuit through the crystal socket shown at the bottom of the unit in the inside view. Three plug-in pick-up loops are used for coupling the output of a grid-dip meter to the bridge. These coils have 1, 3 and 10 turns, respectively, and are mounted on Millen 37412 300-ohm transmission line plugs. The 10-turn coupling coil, which is 1½ inches in diameter, resonates in the bridge over the approximate range 5.2 to 8.8 Mc., de-

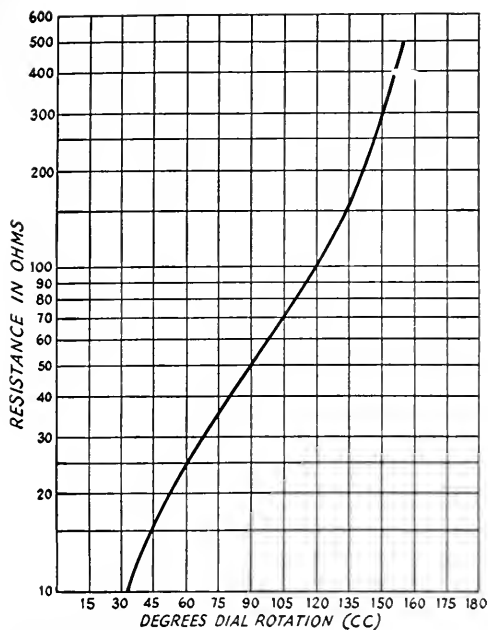


Fig. 3—Calibration curve of the bridge shown in Fig. 2 and the photographs.

pending on the impedance (that is, capacitor) setting. The 3-turn coupling coil, also  $1\frac{1}{2}$  inches in diameter, resonates from 15.5 to 30.5 Mc. and the 1-turn coupling coil (1 inch in diameter) resonates from 32 to 84 Mc. With the bridge set to 50 ohms the 10-turn coil and the 3-turn coil result in the same coupling at 12 Mc.; consequently, the 10-turn coupling coil should be used for measurements below 12 Mc. The 3-turn coil and the 1-turn coil result in approximately the same coupling at 40 Mc.; consequently, the 3-turn coil should be used for measurements between 12 and 40 Mc. and the 1-turn coil should be used above 40 Mc. In general, the coupling coil closest to resonance at the particular capacitor setting in use should be chosen. It is, of course, possible to make coupling coils that will be resonant at the particular frequency for which a measurement is desired, but experience has

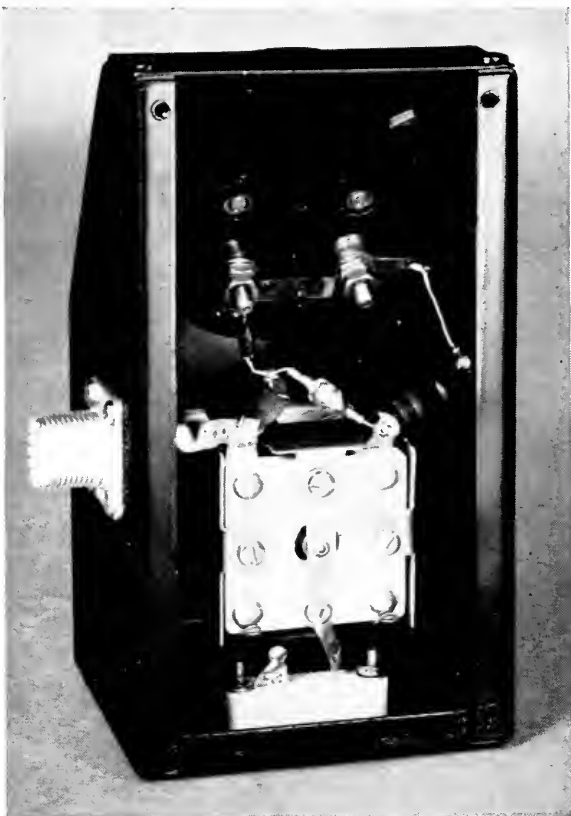
shown that the three coils suggested cover the range adequately. Other coils would be required only under certain very special circumstances.

The 3-turn coupling coil was made by threading the 3 turns through a piece of spaghetti cut to the proper length. The 10-turn link can be wrapped in insulating tape and thoroughly doped in coil cement, or the coil can have a coating of vinylite built up on it by repeated dipping in liquid vinylite material which is readily available for caulking and waterproofing. This material apparently has no harmful effect upon the coils.

### Calibration

The theoretical calibration of angular setting of the capacitor rotor vs. impedance is a shallow S-shaped curve, when plotted on semilog paper, symmetrical with respect to the design center impedance. The curve for the bridge described here is shown in Fig. 3.

A similar curve can be constructed for a given bridge by connecting carbon resistors of various values between 5 and 500 ohms to the output connector and adjusting the capacitor for a null in each case, using a calibrated grid-dip meter as the source of an r.f. voltage of known frequency. A similar procedure at various frequencies within the range of the grid-dip meter will show whether there is any appreciable frequency error, and if so, the frequency at which it tends to become im-



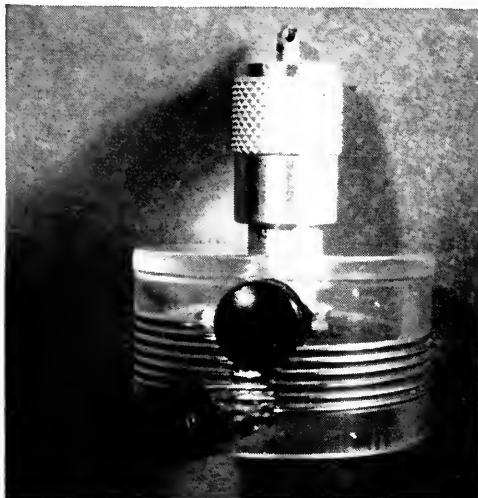
Inside view of the bridge. Components are easily identified with the possible exception of the miniature choke, which is mounted between the left-hand meter terminal and the junction between the 1N34A and the ceramic blocking capacitor.

portant. Lead length between the body of the test resistor and  $J_2$  should be kept to a minimum, particularly with the lower resistance values.

For highest calibration accuracy the test resistors should be measured with an accurate resistance bridge or ohmmeter so their actual resistance is known. If suitable instruments are not available for measuring the resistances, resistors having 5 per cent tolerances or less should be used.

### Applications

When used with coaxial lines or other loads that can have one side grounded, the bridge is applied



Two views of the wound balun. This circuit covers the 10-20-meter range. Similar baluns for other frequencies may be designed and constructed by the method outlined in the text.

to amateur antenna and impedance problems in exactly the same way that the older-type bridges, both fixed and variable, have been applied. Since this subject has been very adequately covered in amateur publications, we will add only a few notes here. The only real difference between this and the previous instruments is the ease with which measurements can be made and the improved

accuracy. The r.f. input to the bridge is not critical, but with a 50-microampere meter movement such as is used in the circuit shown, the measurements should begin with loose coupling to avoid the possibility of damaging the meter. Actual use of the instrument is very simple and in general the procedure for measuring impedance is as follows:

- 1) Couple an r.f. voltage of the desired frequency to the bridge.
- 2) Adjust the coupling by moving either the bridge or the r.f. source so that the meter indicates about 40 microamperes.
- 3) Connect the unknown impedance to  $J_2$ .
- 4) Adjust the dial for minimum meter reading.
- 5) Read the value of the unknown impedance from the calibration.

In this connection, it should be noted that the impedance being measured may not be a pure resistance, in which event the minimum reading will not be an actual null. If a good null (meter reading zero or very close to it) cannot be obtained, the bridge calibration does not hold. (This is true of any bridge circuit which does not incorporate special means for separating the resistive and reactive components of the unknown impedance.) Conversely, a complete null does indicate that the unknown impedance is a pure resistance. With complex unknowns, the reactive component can be tuned out by one of a number of well-known methods, leaving only the resistive component to be measured by the bridge. In such a case, the criterion for proper reactance compensation is the fact that the null is complete.

For s.w.r. checks the bridge capacitor should be set to the calibration point corresponding to the characteristic impedance of the coaxial transmission line in which the s.w.r. is to be measured. This setting should be left unchanged during any subsequent adjustments to matching devices, the object being to adjust the matching circuit to obtain the lowest possible reading on the meter. As is usual, a complete null indicates a 1-to-1 standing-wave ratio.<sup>2</sup>

Balanced lines or loads may be measured with the bridge by using a circuit that provides suitable balanced-to-unbalanced coupling between the bridge and load. The wound balun devised by W2ZE and described below is a very convenient form of such circuit.

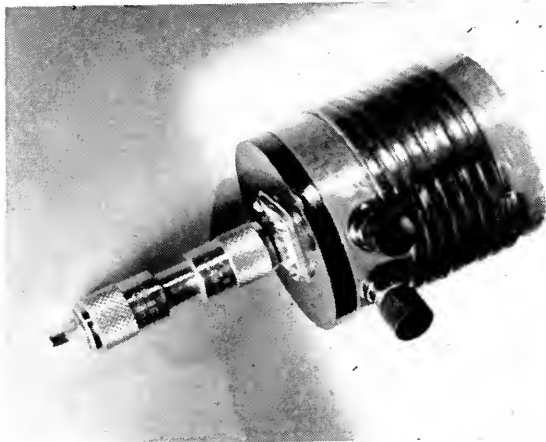
### The Wound Balun

A wound balun is simply an accurate 2-to-1 auto transformer with the residual reactances

<sup>2</sup> Although the factors mentioned in Footnote 1 do not affect the accuracy of impedance measurement with the bridge described, since the bridge is always adjusted for a null in such measurements, they do apply with full weight to the measurement of standing-wave ratios higher than 1 to 1. For s.w.r. measurement, provision for checking the input voltage should be included in the circuit of Fig. 2, and a resistance of at least 10,000 ohms — preferably as much as 50,000 — should be placed in series with the microammeter. However, these precautions are not necessary for purely qualitative comparisons nor for facilitating matching-circuit adjustments where the object is to attain the lowest possible meter reading. Most amateur uses of an s.w.r. bridge are in this category. — Ep.

A balun for 40 and 80 meters, using 150-ohm Twin-Lead (Amphenol 14-079 or Alpha 1151) for the bifilar winding. There are 8 turns of Twin-Lead on  $2\frac{3}{4}$ -inch diameter bakelite tubing. The shunt tuning capacitance for 80 meters is  $62\ \mu\text{f.}$ ; no shunt capacitor is needed for 40 meters. The series capacitance for 80 meters is  $0.0015\ \mu\text{f.}$  and for 40 meters is  $0.001\ \mu\text{f.}$

This model uses a female coaxial connector, which accounts for the double-ended male connector shown in place.



tuned out and as tight coupling as possible between the two halves of its total winding. If the impedance is measured between a grounded center-tap and one terminal of the winding when a balanced load is connected across it, the 2-to-1 turns ratio produces a 4-to-1 step-down in the impedance measurement. For example, a properly-terminated balanced 600-ohm line connected to the outside terminals of the winding would be measured as 150 ohms between the grounded center-tap and either end. This means that the readings of the antenna bridge must be multiplied by four when using the balun. Thus the range of a 5-500-ohm bridge becomes 20-2000 ohms for balanced loads. This coincides with the usual higher impedances of balanced lines. Use of a balun maintains balance during measurement and thus obviates the wild errors usually encountered when one tries to measure any balanced-line impedance without first converting it to a single-ended load.

There are five principal requirements for the construction of an accurate wound balun:

- 1) The two halves of the winding must be as nearly equal and as symmetrically positioned as possible.
- 2) The coupling between the two halves of the winding must be as close to 100 per cent as possible.
- 3) The  $Q$  of the winding must be high.
- 4) The total inductance must be resonated to the frequency of operation by a shunt capacitor across the balanced terminals.
- 5) The residual leakage reactances should be tuned out by means of a capacitor in series with the "hot" single-ended terminal.

These five objectives are accomplished in the following manner:

Symmetry and tight coupling, (1) and (2), are obtained by making the two halves of the winding bifilar. In the 10-20 meter balun illustrated the 2-inch diameter lucite form is wound with its 3-turn windings paired in double-thread, 7 t.p.i. lathe-cut grooves. In winding, the wire starts at the beginning of one thread, continues for three turns to the end of that thread, goes through a hole to the inside of the form, back to a hole

leading out to the start of the second thread, then continues in that thread for three more turns to the end of the winding. The center of the wire, where it goes from the end of the first thread to the beginning of the second, is the exact physical (and electrical) center of the two windings. That point is joined by a short, heavy strap directly to the body of the male coaxial connector.

The  $Q$  of the illustrated balun turned out to be 235 at 14.3 Mc., which is the equivalent of about a 50,000-ohm resistor in shunt with the balanced load to be measured. This causes an error of about 4 per cent in the reading of a 2000-ohm load but only 1 per cent for a 500-ohm load.

When this balun was tuned to operate at 28 Mc., it showed almost exactly the same shunt resistance. Several transmission-line baluns that were tried showed four to five times the error of this wound balun due to their lower  $Q$ .

Tuning out the residual reactances of the wound balun can be done rather easily with the aid of a grid-dip meter. The problem is somewhat simplified if one first calculates the amount of capacitance required to resonate the total winding to the center of the frequency band in which it is to be used. In the case of the illustrated balun, the Lightning Calculator indicated  $2.6\ \mu\text{h.}$  which would require a total capacitance of  $49\ \mu\text{f.}$  to resonate it to the center of the 20-meter band. It was estimated that the coil distributed capacitance would be about  $10\ \mu\text{f.}$  so a fixed  $39\text{-}\mu\text{f.}$  ceramic was connected across the balanced terminals. The grid-dipper then showed resonance at 14.3 Mc., which was plenty close enough.

At first it was thought that the small residual leakage reactances could be tolerated without a correcting condenser in series with the single-ended output. But it turned out to be such an easy job to find the correct value and put it in, and the increased accuracy thus gained was so immediately apparent, that it seems well worth while to include it.

As a starter, it was assumed that the leakage inductance of the coil and leads would be somewhere in the neighborhood of 2 to 3 per cent of the total coil inductance. This would take a con-

(Continued on page 110)

# The Transistorized "Little Gem"

*A Versatile R.F. and D.C. Meter*

BY E. LAIRD CAMPBELL, W1CUT

THE high cost of transistors has limited transistor use in amateur radio. Recently, however, low-cost transistors have been made available, and we can expect to see them in frequent use. Since the transistor is very small, light in weight, rugged and easily powered by a small pen-light cell, its logical application is to portable equipment. The above advantages obviously add up to the transistor's application to portable measuring devices for the ham. The instrument described here can be used in five different ways: field-strength meter, wavemeter, microammeter, milliammeter, and 'phone quality monitor. It is a "natural" for mobile work as it can be carried about without restricting wires or bulky batteries.

The transistor in this unit operates as a current amplifier to multiply the input signal to a value high enough to be indicated on a 0-1 milliammeter. This allows a less expensive and more rugged milliammeter to be used instead of the usual expensive microammeter.

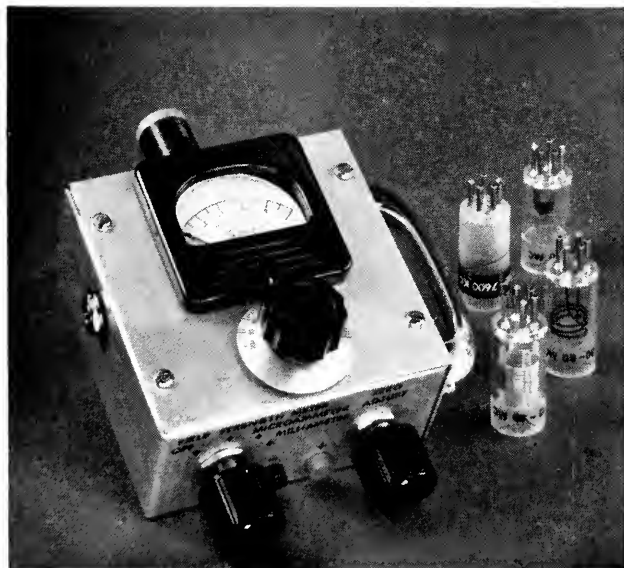
The diagram of Fig. 1 shows the circuit of the instrument. When used as a field-strength meter or a wavemeter, the signal from the source to be measured is received by the antenna and tuned by  $L_1C_1$ . It is then rectified by the crystal diode and impressed on the transistor where it is amplified and indicated on the meter. Since the transistor inherently has a static collector current under no-signal conditions, some means must be provided to electrically balance or zero the meter. This is accomplished by adjusting the variable

• Almost 10 years ago (January, 1946) *QST* carried a description of the "Little Gem," an absorption-type wavemeter that doubled as 'phone monitor and field-strength indicator. By adding the gain of a transistor d.c. amplifier stage, the sensitivity of the gadget is increased considerably, and what is normally a milliammeter becomes a microammeter. This will be found to be a handy and useful instrument to have around the shack. Once you have used it you will see why it is called the "Little Gem."

resistance,  $R_1$ . If the signal being measured is very strong, no external antenna will be necessary for full-scale deflection. When more sensitivity is needed, a short piece of stiff wire can be connected to the antenna binding post.

If it is desired to check the quality of a 'phone signal, it is only necessary to plug a pair of headphones into the 'phone jack. The closed-circuit jack isolates the meter from the circuit and allows the amplified audio component of the rectified signal to be heard.

When the instrument is to be used as a microammeter, the transistor is switched from the diode rectifier circuit to polarized pin jacks mounted on the cabinet. The transistor continues to operate as a current amplifier, and full-scale deflection can be obtained with a very small cur-



The transistorized "Little Gem" with plug-in coils which provide coverage of all amateur bands, 160 through 6 meters. The 'phone jack is mounted on the side of the cabinet and insulated by fiber washers.



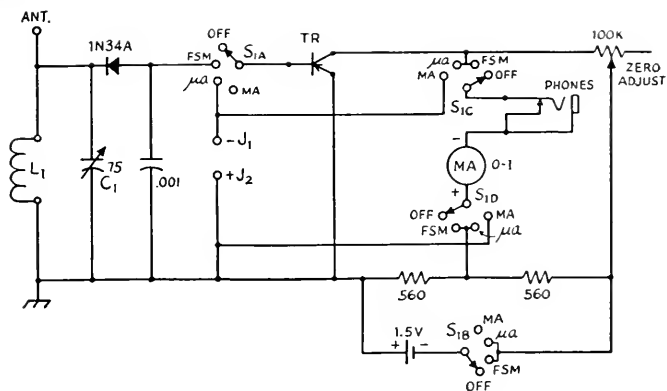


Fig. 1 — Schematic diagram of the transistorized "Little Gem." All resistors  $\frac{1}{2}$  watt.

- $L_1$  — 1700–3000 kc.: 100 turns No. 30 enam., close-wound on  $\frac{3}{4}$ -inch form  
 — 3300–7600 kc.: 32 turns No. 30 enam., close-wound on  $\frac{3}{4}$ -inch form  
 — 12–30 Mc.: 13 turns No. 20 enam.,  $\frac{3}{4}$ -inch form, spaced diameter of wire  
 — 30–80 Mc.: 3 turns No. 20 enam.,  $\frac{3}{4}$ -inch form, spaced diameter of wire  
 — 40–110 Mc.: short loop of No. 10 enam. (plugged directly into coil socket)

All coils are wound on Amphenol 24-5H forms.

$C_1$  — 75- $\mu$ mf. midget variable condenser (Millen 20075)

$S_1$  — 4-pos. 4-pole miniature steatite rotary switch (Centralab PA-2011)

$J_1, J_2$  — Nylon tip jack (Johnson 105-602-1)

TR — PNP junction transistor (Hydro-Aire CQ-1)

rent flow at the input. Since the basic movement of the meter is 0–1 ma., switching is provided to isolate the meter for milliamperere readings. The two pin jacks used for microampere readings are also used for measuring milliamperes.

### Construction

The unit is constructed in a  $4 \times 2 \times 4$ -inch utility cabinet. Placement of the components is not critical for operation, but some care must be exercised because of space considerations. The meter and the tuning control,  $C_1$ , are mounted on the removable front plate. Since the meter is mounted at the very top of the face plate, some of the lip on the box will have to be removed to allow the meter to fit properly. Function switch, zero adjust control and pin jacks are all mounted on one end of the box, with the coil socket and antenna post on the other. The 'phone jack and holding handle are secured to opposite sides of the box. The handle on this unit was placed for a left-handed person but it can be mounted on either side. The transistor is supported by its own leads, and great care must be exercised in soldering because an excess of heat will permanently impair its operation. It is good practice to hold

the leads of the transistor with long-nose pliers while soldering so the heat will flow into the pliers and not the transistor. A small pen-light cell is used to power the transistor and it is supported by soldering the plus terminal of the cell to the tie-bolt of the switch assembly. The negative or case side of the cell is not supported and the lead to it is soldered to the bottom of the cell. Plug-in coils for the unit are wound on Amphenol miniature plug-in coil forms which require a special socket (Amphenol 78-85S). The range of the coils in this set covers 1700 kc. to 120 Mc. If it is desired to include the 144–148 Mc. band, a smaller tuning capacitor should be used.

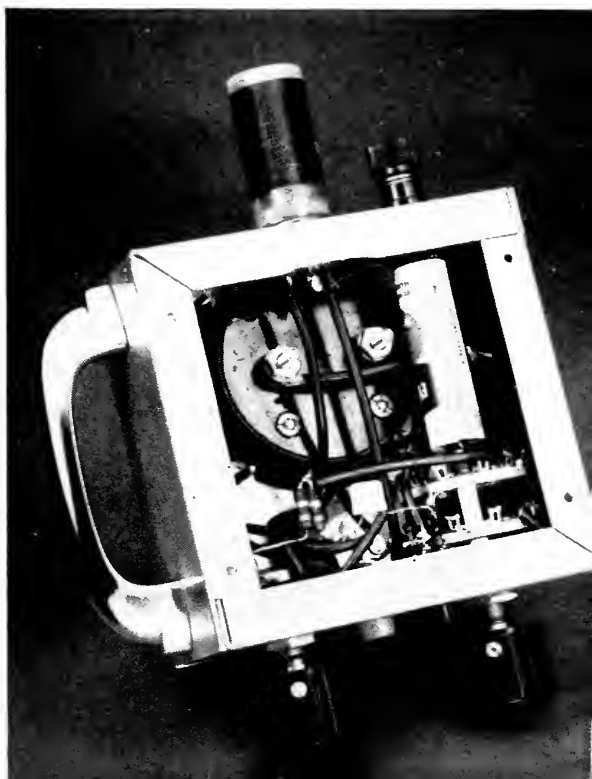
### Operation

To use the instrument as a field-strength meter or microammeter, the function switch is turned to the desired position and the meter is balanced by rotating the zero adjust

control until the pointer is set on zero. The meter is now ready for use and no further adjustments are necessary. To measure the strength of a signal, the tuning control is turned until the maximum reading is found. Once the tuning control is set, relative strength measurements can be made for different antenna conditions. A calibration chart

(Continued on page 112)

Bottom view showing placement of components. The transistor can be seen at bottom center supported by its own leads. The pen-light cell is supported by soldering the plus cap to the switch tie bolt.



# 807s in Parallel

## 75- to 150-Watt Amplifier with Pi-Section Output

BY FRANCIS M. YANCEY,\* K4CDO

THE amplifier shown in the photographs was designed to cover all bands from 3.5 to 30 Mc. It can be operated at an input of 150 watts on c.w., or 120 watts on 'phone. However, it will operate efficiently at 75 watts input for Novice use.

### Circuit

A pair of 807s in parallel is shown in the circuit diagram of Fig. 1. A pair of 1625s may be substituted if a 12.6-volt filament transformer is provided.

The amplifier is capacitively coupled to the driver through the 100- $\mu$ f. mica capacitor,  $C_1$ . (If the driver includes an output coupling capacitor,  $C_1$  may be omitted, of course.)  $L_1$  and  $L_2$  are small inductors which, in conjunction with  $R_2$  and  $R_3$  in the screen leads, are used for the suppression of v.h.f. parasites.

A combination of battery and grid-leak bias is used. Since the screens are operated from a low-voltage source, the fixed bias provided by the battery will cut the input to the 807s to zero when excitation is removed, as in keying preceding stages for c.w. operation. When the screens are supplied through a dropping resistor from the

\*523 Taylor St., Lexington, Va.

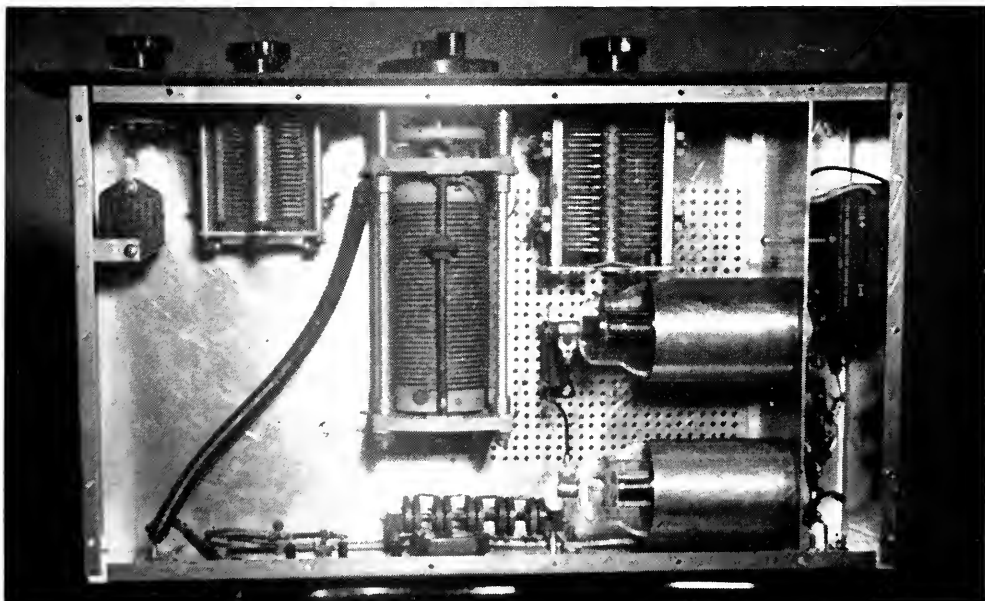
• Judging from our mailbag, the greatest demand in transmitters these days is for a job running at 100 to 150 watts input. This parallel 807 job fills the bill quite simply and inexpensively.

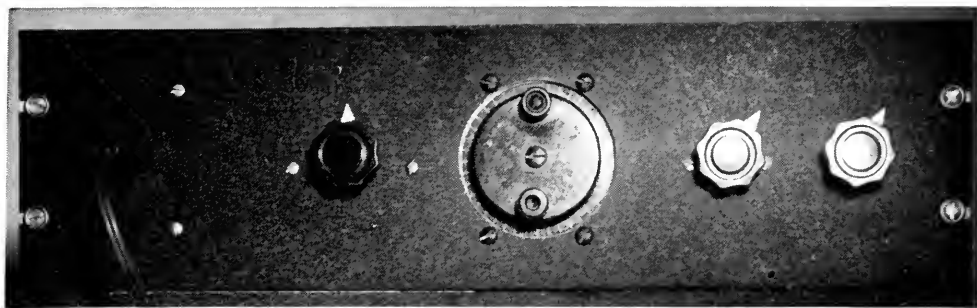
plate supply, as required for plate-screen modulation, the battery will hold the input to a safe level in case of excitation failure, although the input will not be reduced to zero.

A pi-section tank circuit is used in the output, and parallel plate feed is therefore necessary. Either a rotary inductor from a surplus BC-375-E antenna-tuning unit or a Johnson type 229-201 inductor may be used as the variable inductor,  $L_4$ .  $L_3$  is a separate inductor for 10-meter operation. It will not be needed if the Johnson inductor is used, or if the surplus inductor is used and 10-meter operation is not required.

The required output capacitance is furnished by a combination of a variable capacitor,  $C_5$ , and several fixed capacitors that may be switched in parallel with the variable. A total of about 2000  $\mu$ f. should be provided. For a continuous range of capacitance, each of the fixed capacitors

Top view of the parallel 807 amplifier. The variable output capacitor is at the upper left with the fixed mica capacitors and switch in the corner. The variable input capacitor is to the right of the variable inductor. The r.f. choke and by-pass fastened to the rear wall of the chassis are in the plate circuit. The biasing battery can be seen in the compartment to the right which also houses the input-circuit components.  $L_3$  and  $C_6$  were not used in this unit.





Panel view of the 150-watt amplifier showing the grid-meter jack, and controls for the pi-section input capacitor, variable inductor, variable output capacitor and fixed-capacitor switch.

should have a capacitance not greater than the maximum capacitance of the variable. As an example, a 500- $\mu\text{mf}$ . variable and three 500- $\mu\text{mf}$ . fixed capacitors may be used. A 250- $\mu\text{mf}$ . variable, on the other hand, will require seven 250- $\mu\text{mf}$ . fixed capacitors and a switch to accommodate them.

$RFC_2$  removes the d.c. plate voltage from across the input and output tuning capacitors, reducing the required voltage rating of these capacitors. It also provides protection against plate voltage appearing on the transmission line should the plate blocking capacitor,  $C_3$ , break down. In this event,  $RFC_2$  will short-circuit the plate supply. If the primary of the plate transformer is provided with a 3-ampere fuse, the supply will be protected.

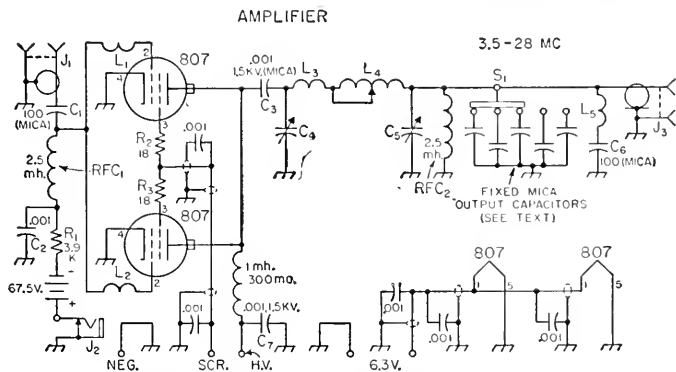
$C_6$  may be useful in localities where TVI is bothersome on one particular v.h.f. channel. In this case, the capacitor can be series-resonated to the particular channel by adjusting its lead length (represented by  $L_5$ ). It should be connected directly across the output coax connector.

Plate and grid milliammeters are not included in the unit, but are mounted externally on another panel to keep them out of r.f. fields.  $J_2$  is provided for plugging in a cord from the grid milliammeter while checking grid current. The plate meter is wired in permanently through terminals at the rear of the chassis. If desired, the jack can be omitted and the grid milliammeter wired in permanently, also.

### Construction

An inverted 10 × 17 × 4-inch aluminum chassis is used as a shielding enclosure for the amplifier. A standard bottom cover is used as the top cover. The chassis and the cover are perforated in the area near the tubes to provide ventilation. Holes in addition to those provided are drilled in the cover and along the lips of the chassis so that the cover may be secured tightly to the chassis with No. 6 self-tapping screws. The chassis is centered behind a standard 5¼-inch aluminum rack panel.

The S07s are mounted horizontally from a



*Fig. 1* — Circuit of the parallel 807 amplifier.

- C<sub>1</sub> — Not needed if driver has output coupling capacitor.
- C<sub>4</sub> — 250- $\mu$ f, 1200-volt variable (National TMS-250 or TMS-300, Bud CE-2007 or similar, 0.03-inch plate spacing). See text.
- C<sub>5</sub> — 250  $\mu$ f, or larger. See text. For low-impedance output, receiving spacing adequate. (Johnson 140R12, Bud MC-1860, MC-909 or MC-910, Hammarlund RMC-325-S, MC-250-M or MC-325-M).
- L<sub>1</sub>, L<sub>2</sub> — 22 turns No. 30 enam.,  $\frac{1}{4}$ -inch diam.,  $\frac{3}{16}$  inch long.

- L<sub>3</sub> — 3 turns No. 10,  $\frac{3}{4}$ -inch diam.,  $\frac{3}{4}$  inch long (see text).
- L<sub>4</sub> — Rotary inductor (see text).
- L<sub>5</sub> — See text.
- J<sub>1</sub> — RCA-type shielded phono jack.
- J<sub>2</sub> — Closed-circuit 'phone jack.
- J<sub>3</sub> — Coax connector.
- S<sub>1</sub> — Progressively-shorting rotary switch (Centralab P-121 index head, P1S wafer).

All capacitances less than 0.001  $\mu\text{f.}$  are given in  $\mu\text{f.}$   
All fixed capacitors disk ceramic unless otherwise specified.  
All resistors  $\frac{1}{2}$  watt unless otherwise indicated.

partition spanning the chassis. This partition is made from a piece of aluminum cut  $4\frac{3}{4}$  inches wide by 10 inches long. Half-inch lips are bent over at the front end and along the bottom edge for fastening it with machine screws to the front wall and bottom of the chassis. The partition is spaced 2 inches from the end of the chassis. The tubes are provided with aluminum shield cans, and the sockets placed sufficiently far to the rear to leave space for the input capacitor,  $C_3$ .

Most of the assembly and wiring to the sockets can be done before the partition is fastened permanently in place. Pins 4 and 5 of each socket should be grounded right at the socket. The No. 2

bottom end of  $RFC_1$  and an insulated tie point, and the grid by-pass,  $C_2$ , is connected between the bottom end of the choke and a ground on the partition. The negative terminal of the biasing battery is also connected to this tie point, while the positive terminal goes to  $J_2$ .

Three shielded and by-passed leads are prepared as described in the TVI chapter of the *ARRL Handbook*. One lead is connected to the junction of  $R_2$  and  $R_3$ . The other two leads are fastened to the No. 1 pins of the sockets. After the partition has been fastened in place, the lead from the junction of the resistors should be connected to the screen-voltage input terminal. The other two leads both are run together to the ungrounded heater input terminal. The shields of these three leads are grounded at both ends, to each other, and to the chassis at several points.

The plate blocking capacitor,  $C_3$ , is mounted with one of its terminals central in respect to the two 807 plate caps to permit plate leads of equal length. The parallel-feed plate choke,  $RFC_3$ , is mounted off the rear wall of the chassis, with its cold end close to the high-voltage input terminal. The plate by-pass,  $C_7$ , is fastened against the rear wall of the chassis, and is connected between the cold end of the r.f. choke and the high-voltage input terminal with the shortest possible leads.

The variable inductor cannot be mounted centrally in the chassis without interfering with the removal of the 807s. It is placed an inch or so away from the plate caps of the tubes, and the input and variable output capacitors are spaced symmetrically on either side. The fixed capacitors in parallel with  $C_5$  are stacked up and fastened to a grounding bracket attached to the left-hand end of the chassis. The front terminals of these capacitors are connected to the terminals of  $S_1$  mounted immediately in front.

### Adjustment

The values of input and output capacitance and the value of the inductance to be used in the pi network will depend upon the voltage and current at which the amplifier is operated. For full input on c.w., a voltage of 750 at 200 ma. is required for the plates, and 250 volts at 12 ma. for the screen grids. In this case, screen voltage is best obtained from the exciter plate supply. For full input on 'phone, a supply delivering 600 volts at 200 ma. is needed, and 275 volts at 13 ma. for the screens. For 'phone work, the screen voltage should be taken from the plate supply through a 25,000-ohm 20-watt resistor.

For Novice operation, the amplifier can be operated, for instance, at 500 volts, 150 ma. with both tubes in use, or at 750 volts, 100 ma. with one of the tubes removed.

An accompanying table shows the values of input and output capacitance and the inductance required for a tank-circuit  $Q$  of 12 and 50-ohm output under the four operating conditions described above. The Johnson inductor does not have sufficient inductance for a  $Q$  of 12 under

(Continued on page 112)

### OUTPUT-CIRCUIT VALUES

Band (Mc.)	3.5	3.5	7	14	21	28
750 volts, 100 ma. (3750 ohms)						
$C_{IN}$ (uuf.)	150	230 <sup>1</sup>	75	38	25	20
$C_{OUT}$ (uuf.)	910	1700	450	225	150	110
$L$ (uh.)	14.8	10.0	7.4	3.7	2.5	1.8
750 volts, 200 ma. (1875 ohms)						
$C_{IN}$ (uuf.)	300	250 <sup>2</sup>	150	75	50	37
$C_{OUT}$ (uuf.)	1570	1160	785	390	260	195
$L$ (uh.)	7.9	9.3	4.0	2.0	1.3	1.0
500 volts, 150 ma. (1666 ohms)						
$C_{IN}$ (uuf.)	340	250 <sup>3</sup>	170	85	55	40
$C_{OUT}$ (uuf.)	1680	1100	840	420	280	210
$L$ (uh.)	7.1	9.3	3.5	1.8	1.2	0.9
600 volts, 200 ma. (1500 ohms)						
$C_{IN}$ (uuf.)	380	250 <sup>4</sup>	190	95	63	47
$C_{OUT}$ (uuf.)	1820	1000	910	455	300	227
$L$ (uh.)	6.4	9.3	3.2	1.6	1.1	0.8
<sup>1</sup> $Q=19$ <sup>2</sup> $Q=10$ <sup>3</sup> $Q=9$ <sup>4</sup> $Q=8$ All others $Q=12$						

pins are joined by the two resistors  $R_2$  and  $R_3$  in series.  $RFC_1$  is a National R-100-S, or similar model, with an insulating mounting. It is placed centrally between the two sockets and between the partition and the end of the chassis. It is eventually fastened against the bottom of the chassis. However, until the assembly is ready to be fastened in place, it is suspended by its leads. The two parasitic suppressor chokes,  $L_1$  and  $L_2$ , are connected between the No. 2 pins on the sockets and the top of  $RFC_1$ . If  $C_1$  is used, it should be connected between the top of the r.f. choke and the excitation input connector,  $J_1$ . Otherwise, a short piece of wire should be substituted. The grid leak,  $R_1$ , is mounted between the

# Power and Meter Facts in S.S.B. Operation

## *Interpreting the Linear-Amplifier Plate Meter Reading*

BY HOWARD F. WRIGHT, JR.,\* WIPNB

• Here is some down-to-earth talk about linear amplifiers, power ratings and meter readings that is "must" reading for all s.s.b. enthusiasts. WIPNB presents the case in simple, nontechnical language and with illustrations that clearly demonstrate the basic principles.

ward. In this it also fails. If a constant sound is used instead of words, the meter stabilizes at an "average" value. When the signal varies with the syllables of speech, the meter bobbles around. The amount of movement depends upon many factors. Meters can have differing time constants (speeds of response). Different voices contain varying amounts of "average" power. The amount of swing depends, to some degree, upon the class of amplifier operation: AB<sub>1</sub>, AB<sub>2</sub>, or B.

**D**o you ever see an article mainly concerning the plate meters of final r.f. amplifiers? For that matter, have you ever given the subject much thought? Well, if not, it's certain that you have never used a linear amplifier in single-sideband suppressed-carrier operation. Of course, if you are a person with absolutely no aspirations toward s.s.b. in the future, you might be excused for saying, "Who cares?" However, the way things are progressing on the "Donald Duck" front, I think there are many who will be interested in the following material.

Why all the fuss about meters? In the days of regular a.m. there wasn't much concern. The d.c. plate meter gave most of the answers without complaint. Watch the meter. Tune up the rig. Figure the power input — no strain, no pain! What could be neater? To say that this no longer holds true with a linear amplifier in suppressed-carrier service would be quite an understatement. Strong men have wept bitter tears and spent sleepless nights because of the behavior (or misbehavior) of their linear's plate meter. Why? Simply because most of us seem to find it extremely difficult to modify our nearly complete, all-abiding faith in the value of the plate meter in indicating final amplifier performance.

Let's get down to brass tacks. The attitude of an amateur toward the plate meter of his linear final, under voice conditions, is of great importance. It could, from a broad point of view, mean complete success or partial failure of amateur narrow-band communication techniques.

Why does the d.c. plate milliammeter fall down so badly in indicating the performance of amplifiers in s.s.b. voice service? It's because the meter is no longer able to settle at a steady value as it did in the amplification of unvarying carrier signals. The voice modulation consists of sporadic bursts of energy. They say, "The hand is faster than the eye." If so, the voice is certainly faster than the meter. The meter just doesn't move rapidly enough. It starts to follow the first voice impulse up, but moves so slowly that it meets the signal coming down. Then it tries to follow down-

### *Distortion*

A "linear" must amplify the signal from its exciter without changing the waveshape of the original signal. Any change of waveshape is distortion. Distortion means that new signals are generated. These new signals result in splatter. Serious splatter needs no comment.

Every linear amplifier has an amplitude point at which it will produce no further undistorted output. Although the driving signal continues to increase, the output no longer increases in exact proportion. While any change of the signal waveshape at levels other than this maximum value also causes some trouble, it is most imperative that the "limiting" or "flattening" point not be exceeded.

I have previously indicated that the plate meter is basically incapable of indicating the peaks of a voice signal. Any relationship between voice excursions of the plate meter, as it measures d.c. power input, and undistorted unflattened amplifier output is apt to be purely coincidental.

We now have both elements of a conflict. On one hand there are the years of reliance upon the plate meter in indicating amplifier performance, and on the other the meter's basic inability to show lack of linearity. If the meter is such a poor performer, why do we continue to use it? Simply because, when properly interpreted, the meter is still a valuable gadget. It just needs a bit of understanding.

### *Meter vs. 'Scope*

Articles concerning linear-amplifier adjustment make adequately clear the fact that the oscilloscope is the best tool for indicating performance. Whether the use of this valuable instrument is any more vital to the adjustment of a s.s.b. transmitter than it is to making a conventional a.m. 'phone station work properly might be a matter for debate. While a gratifying number of amateurs are now using 'scopes, it would be unrealistic to think that all s.s.b. stations will ever be monitored at all times by operators using such instruments. In fact, an operator who understands what his plate meter means, in conjunction with some

\* 55 Sigourney St., Bristol, Conn.

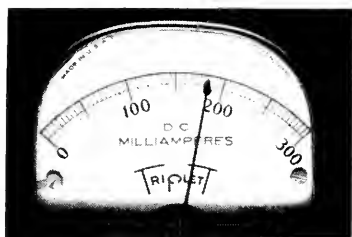


Fig. 1

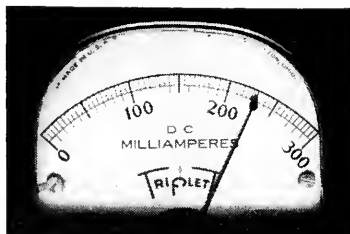


Fig. 2

Each of the accompanying photographs consists of a comparison between the plate milliammeter reading and the output waveshape of a linear amplifier. While each picture shows a different type of signal input, actual amplifier adjustment remains unchanged in all cases. The purpose of the comparison is to demonstrate the action of the average-reading meter as compared to the instantaneous-reading 'scope while indicating signals of varying wave-shapes.

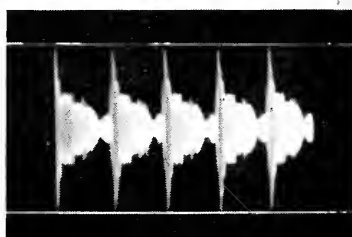
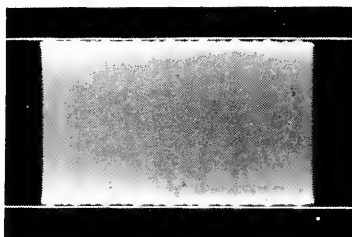
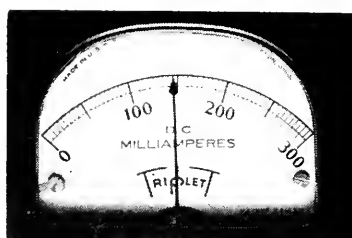
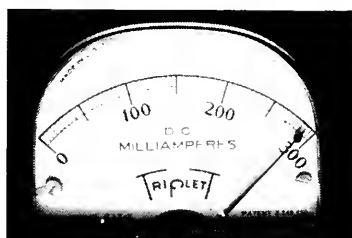


Fig. 3

Fig. 4

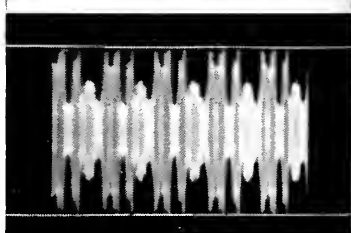
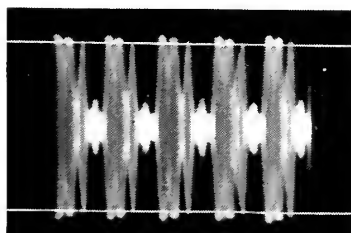
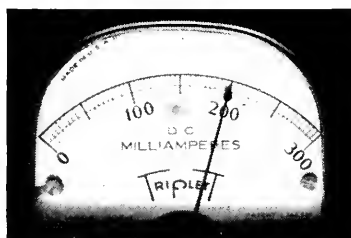
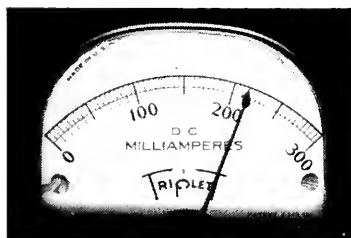


Fig. 5

Fig. 6

form of output indication, can do quite well with no 'scope.

Each of the accompanying photographs shows a different condition of amplifier operation or type of signal input as seen on both a 'scope and the d.c. plate milliammeter. The purpose is to demonstrate the action of the average-reading meter as compared to the instantaneous-reading 'scope. Both continuous signals and voice are used.

Fig. 1 shows a two-tone test signal. This type of signal is used to determine linearity and lack of distortion on all parts of the waveshape. At this time, notice only one thing. The top of the pattern remains unflattened and fills up the space between the limit lines. No splatter caused by distortion of peaks occurs as long as we do not try to exceed the limits while using this set of amplifier conditions. This holds true in all the following pictures regardless of the type of signal input.

Fig. 2 shows the amplifier being driven into distortion on the two-tone signal. The peak linear-

*Fig. 1 — The "two-tone" linearity test signal which was used to adjust the amplifier for low distortion over all parts of the waveshape. At this time, notice only one thing: the top of the pattern remains "unflattened" or "unsquashed." It extends exactly from one horizontal line on the oscillogram to the other. These lines represent the point of peak linearity capability of the amplifier. No splatter caused by "limiting" of peaks can occur as long as we do not try to drive any type of signal past the amplitude point represented by the lines. This holds true in all of the pictures.*

*Fig. 2 — The amplifier driven into heavy distortion on the same test signal. The linearity capability has been exceeded. Note the "squashing" of peaks. Now compare the meter reading to that of Fig. 1. The meter shows what we all like to see — more power input; but the 'scope indicates this is distorted power.*

*Fig. 3 — The result of inserting a steady audio tone into a s.s.b. exciter. It may not look like sine-wave radio, but that is because we no longer have an audio signal. The exciter converted the single tone audio into single frequency r.f., the same as an unmodulated carrier. (The slight ripple represents imperfect sideband and carrier suppression and harmonic audio distortion.) Look at the meter! On steady signal the amplifier has no time to rest. It works regularly — not in spurts — as on voice. The meter has a chance to indicate maximum signal input.*

*Fig. 4 — Actual voice waveshapes. A sustained note was used for clarity of presentation. Notice that the high-amplitude low-energy peaks which are encountered in the voice just reach the lines representing maximum permissible amplitude. Look at the meter. Oh, how sad! That is the current we must use to figure power input.*

*Fig. 5 — The audio gain increased to give a more satisfying meter reading. Yes, the meter reads more, but look at the 'scope. Those peaks are really flattening. Splatter! Zounds! No escape! A clean signal dictates low meter reading, while greater deflection causes trouble.*

*Fig. 6 — Another voice sound, purposely altered by audio compression to increase the "average-to-peak" ratio. Notice that the meter again shows an increase over the conditions of Fig. 4. This is also due to "flattening" of the waveshape. Distortion of the audio signal is again present, as it was in Fig. 5, but no splatter is transmitted if the resulting new frequencies are carefully filtered out early in the exciter. New frequencies, caused by r.f. amplifier flattening, cannot be removed. They will be transmitted to plague adjoining channels.*

ity capability has been exceeded. Note the flattening of the peaks. Now notice the meter reading as compared to Fig. 1. The meter shows what we all like to see — more power — but the 'scope indicates that it is distorted power.

Fig. 3 shows the result of introducing a single audio tone into the speech amplifier. It may not look like sine-wave audio, but this is because we no longer have an audio signal. The s.s.b. exciter converted the single tone audio into single frequency r.f. — practically the same as an unmodulated carrier. Look at the plate meter! On steady signal the amplifier has no time to rest. It works regularly — not in spurts as on voice. The meter has a chance to indicate full maximum signal input.

Fig. 4 shows an actual voice waveshape. The sound used was a sustained "O-o-o-h-h-h." Notice that the "peaks" just reach the limit lines. Look at the meter. Oh, how sad! That's the current we must use to calculate power input!

Fig. 5 is the condition where the audio "gain" is increased to correct the low meter reading. Yes, the meter reads more, but take a look at the 'scope. Those peaks are really flattening. Splatter! Zounds! No escape! A clean signal means lower meter reading, while greater deflection causes trouble.

Fig. 6 shows the same voice sound, purposely altered by audio compression, to increase the "average-to-peak" ratio. Notice that the meter again shows an increase over the conditions of Fig. 4. This is also due to the flattening of the waveshape. Distortion of the audio is present, but no splatter results if the new frequencies are carefully filtered out early in the exciter. New frequencies resulting from r.f. linear amplifier flattening cannot be filtered out. They will be transmitted to plague adjoining channels.

Study of the photographs reveals that there is, as previously mentioned, lack of connection between d.c. meter readings and the type and quality of actual amplifier output.

The situation looks rather gloomy, doesn't it? Is it possible for an average amateur to operate a linear amplifier properly without access to laboratory measuring techniques? Well, the best answer I can give is that hundreds are doing it every day. Perhaps the meters don't give all the necessary indication, but never underestimate the flexibility of an amateur. The trial-and-error system can do wonders.

### *Splatter*

A chain of two or more linear amplifiers, upon construction, is hardly ever able to develop maximum rated output without considerable adjustment. Luckily, s.s.b. transmitting and receiving techniques have the valuable property of making nonlinear amplifier distortion and splatter stick out like a sore thumb. While the same amount of distortion would be partly hidden by the voice sidebands of a double sideband signal and be somewhat obscured by lack of selectivity in an ordinary receiver, such is not the case on s.s.b. There is no such thing as distortion splatter which



appears on only one side of the carrier frequency.

A s.s.b. receiver has an opportunity to view, generally unhindered by readable signal from the s.s.b. exciter, the amplitude, nature and frequency spread of nonlinear amplifier splatter appearing on the unwanted sideband. This situation makes possible accurate and worth-while on the air reports of amplifier performance. In cases of "peak limiting" distortion, one can simply turn down the gain until the person at the receiving end reports a clean "unwanted" sideband. Changes can then be made to try and allow more power without degrading the signal.

### Power Input

Now what about power input? Ask a s.s.b. operator exactly how much power he is running. The answer might sound something like, "Well, the plate voltage is 2000 and the meter kicks up to about 200 mils on voice peaks. That's about 400 watts. Of course, that's only meter reading. Actually, the peak power is a lot more than that."

Now really pin him down. Ask him what his "peak" power really is. For that matter, what does he mean by "peak power"? Chances are, his eyes might take on a rather furtive look. He might mention something about multiplying the meter reading by the factor 1.57. Don't press him too far. You might become as confused as he is.



Actually, the power-input situation is not nearly as complicated as it is confused. The indiscriminate use of the word "peak" to describe three distinctly different conditions is detrimental to the clarity of the otherwise fairly simple matter of power-input considerations.

The three uses of "peak," as heard on the air and seen in print, are "instantaneous peak power," "peak envelope power," and "meter peak, on voice, power." Unfortunately, it has seemed fashionable to omit the qualifying terms and call any one of them "peak power." When this happens, even a person who understands the situation perfectly must determine which yardstick is being used before giving intelligent consideration to the particular situation involved.

There are two ways which I could use to explain the different kinds of "peak power." One would be to draw a rather involved illustration of a modulated r.f. signal, showing both individual r.f. cycles and cycles of modulating voltage. The other, which I shall try, is to explain the same effects in a non-radio example which closely parallels the case of modulated r.f. energy.

Our example is to be a "four-way" reading lamp, one that plugs into the 110-volt a.c. socket and allows the user to select various conditions of brightness. One setting is "off" — the others

"...I COULD DRAW  
A RATHER INVOLVED  
ILLUSTRATION OF  
A MODULATED  
RF SIGNAL"



range from "dim" to full intensity of the 100-watt bulb. Now let's imagine that this light bulb represents the r.f. output signal of a s.s.b. transmitter, not in the usual sense of a "dummy load," but with the more abstract view that each cycle of 60-cycle a.c. current represents a similar cycle of high-frequency energy in the r.f. signal. Thus the lamp, burning steadily at full brilliance, represents a s.s.b. amplifier with full "inserted carrier" of 100 watts. Now, still in the abstract vein, the brightness control switch of the four-way lamp will be used to represent modulation. The switch is made to vary the brilliance of the lamp at a fairly slow and sporadic rate from one intensity to another. This simulates voice modulation. The remaining item in our flight of fancy is something to represent the plate milliammeter in the transmitter. Let's say that we connect an a.c. ammeter, with a very sluggish movement, in series with the a.c. cord to the lamp. This simulates the inability of a plate meter accurately to follow voice modulation. We are now ready to demonstrate the meaning of "instantaneous peak," "peak envelope or maximum signal," and "meter peak, on voice" power.

To find "instantaneous peak power," we turn our 100-watt light to full brilliance. For simplicity, let's say that the r.m.s. voltage is 100 instead of 110. Ohms Law says that the r.m.s. current is 1 ampere. Consider only one cycle of the 60-cycle wave. The "crest or instantaneous peak" voltage in this cycle is 1.41 times 100 volts. This is 141 volts. The current at "peak" is 1.41 amperes. If  $P = IE$ , the concept of "instantaneous peak power" says that 200 watts of power exist for an infinitely small period of time at the crest of the cycle. What does this mean from the point of view of a man reading a book? Nothing! He's got a lamp that gives a hundred watts of illumination and he knows it. The same holds true in a radio transmitter. "Instantaneous peak power" has very little value in everyday operation and adjustment.

Now to the heart of the matter — "peak envelope power" or "maximum signal power." This is possibly the most useful of our terms. It is the way tube manufacturers rate their product. More often than not, it is meant when one sees "peak" mentioned in print. What is the value in the case of our light bulb example? — 100 watts; it's as simple as that! Just a minute! How can the 100 watts be "peak power" and still be the value determined by multiplying average r.m.s. voltage times r.m.s. current (100 volts times 1 ampere)? This certainly gives "average" and not "peak" power. In this case, the word "peak" no longer

refers to the crest of the 60-cycle wave. To show what is meant, we no longer run the lamp at full power, but simulate modulation by varying the average power all the way from zero to maximum. Now the light bulb (or amplifier) doesn't work fully all the time. It has comparative periods of rest because the signal is pulsating at a sporadic rate. In this case "peak" refers to the fact that the full 100 watts average power only exists for a relatively short period of time. So short, in fact, that the sluggish a.c. meter in the line would never have a chance to indicate an amount of average power approaching the 100 watts we know briefly exists.

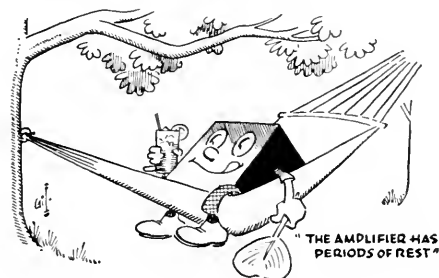
The obvious solution to determining "maximum 'average' signal power" is to switch the lamp to full brilliance and leave it there while the meters catch up. The same holds true with a s.s.b. transmitter. Never measure "peak envelope or maximum signal power" under voice conditions. Insert carrier or whistle into the microphone and the meters will accurately record this kind of "peak" power. From a strictly r.f. point of view, we are still dealing with "average power" values. These should be familiar to all of us.

"Meter peak, on voice, power" is fairly self-explanatory. I have said that the a.c. meter in our lamp cord was far too sluggish to follow even the relatively slow variations of power which represented modulation. It has already been explained why power figures derived from fluctuating d.c. meters are nearly useless as an indication of amplifier performance unless correlated with other measurements. I mention this type of power again only to show the need for learning what kind of "peak power" is being used whenever the subject arises in a discussion of linear amplifiers.

Perhaps unfortunately, from one point of view, the regulations require that s.s.b. transmitter power be determined from meter swings on voice. This has the effect of keeping the pressure on an amateur to achieve more meter swing. That's fine, if it isn't done at the expense of linearity. This measuring system leads to an interesting situation. If one has an amplifier that "talks up" to a kilowatt, he wouldn't be able to whistle into the microphone without exceeding the legal limit. However, the "maximum signal power" would be the same in both cases.

Earlier I mentioned the figure 1.57 in connection with "peak" power. Never use it unless you are dealing with "two-tone" tests. What is a "two-tone" test? Just because a s.s.b. exciter is generally used as a source of signal for this linearity test doesn't mean that it is a complicated situation. Actually, two ordinary r.f. oscillators, separated in frequency by several hundred cycles and simultaneously feeding equal signals into a linear amplifier chain, would work equally well. I won't go into the reason why two steady frequencies, rather than one, are used to show distortion. However, one thing may seem strange. The average amplifier power, as read by the meter, is much less with two signals than it is with one. Due to the combination of the signals, the amplifier no longer works all the time. It has

periods of rest. The "maximum signal power" remains at full value, but the "average-reading" meter indicates far less current. If the amplifier is Class B, the meter now only reads about 64 per cent of its value for one signal of the same maximum amplitude. The reciprocal of .64 is 1.57. Thus the meter reads 1.57 times as much on a



single signal (such as carrier) as it does on a "two-tone" test. This factor only applies to Class B operation. Class AB<sub>2</sub> and Class AB<sub>1</sub> have respectively lower ratios of difference in meter readings between signals of one and two frequencies. Continuing in the same direction, Class A entails a ratio of unity because there can be no change of plate current, regardless of the type or number of signals.

From the above, one can see that the figure 1.57 should only be used in one specialized case, never when referring to voice deflection of a meter. A person can't look at a dancing plate meter and accurately see that his "maximum signal or peak envelope power" is a certain given amount. As a final check to prove that the factor 1.57 actually works out in practice, refer back to the photographs and compare the currents in Figs. 1 and 3.

### Adjustment Without a 'Scope

This isn't basically an article on linear-amplifier adjustment, but I am going to give an example to demonstrate the proper use of d.c. meters when nothing better is available. The procedure falls into the "cheap and dirty, but rather effective" class.

Before I proceed I point out that throughout this article I have mentioned only the "final amplifier." Actually, flattening and distortion may occur in any driver stage. I do not think it necessary, for our purposes, to stress meter readings and waveshapes for other stages. The indications occurring at the output of the final accurately reflect the condition of earlier stages. Of course, in actual practice it is necessary to locate and work on the weak link.

Let's say that I have an amplifier whose specs call for a plate voltage of 1500 and maximum signal current of 300 ma. (Remember, the manufacturer means on a single steady signal, not voice.) First, I insert some carrier from the exciter. I tune the grid and plate circuits to resonance as indicated by an output indicator. (Any type of output indicator connected to the feedline

(Continued on page 116)

# One Tube—80 and 40 Meters—75 Watts

*Using the 6146 as a Crystal Oscillator*

BY LEWIS G. McCOY, W1ICP

**Y**ES, the title is correct. This article describes a one-tube, two-band, crystal-controlled oscillator capable of running approximately 75 watts input. By utilizing a single tube as a high-power oscillator, the circuitry, wiring, and construction are kept as simple as possible. In addition, by making use of the "economy" power supply,<sup>1</sup> watts-per-dollar is held at a maximum. Another feature of the rig is that when the Novice graduates to the General Class ranks, the components can all be used in an all-band rig.

## Circuit Details

The "economy" power supply uses an ordinary replacement-type transformer in a bridge circuit. As can be seen from the circuit diagram, Fig. 1, the transformer rating is 350 volts each side of center tap, but the output voltage obtained is approximately 500. The supply will deliver 500 volts at 140 ma., which is adequate for the one-tube transmitter. For tune-up purposes, the output of the power supply can be switched from high to low voltage. The low potential output is 280 volts.

In order to limit the input to 75 watts, the screen voltage is held to 125 volts by  $R_1R_2$ . With the supply output switched to low voltage, the screen drops to 80 volts, convenient for tune-up purposes.

The crystal current is monitored by a 2-volt 60-ma. bulb connected between the crystal and chassis ground. The bulb also serves as a fuse, in the event the crystal current should accidentally rise above a safe value.

To avoid coil changing, a portion of the plate

<sup>1</sup>Grammer, "More Effective Utilization of the Small Power Transformer," *QST*, Nov., 1952.

• If this transmitter doesn't become a very popular design for a "first transmitter" we're going to change fortune-tellers. It has all the desirable features a Novice transmitter can have: full power, maximum watts-per-dollar, and ease of construction and operation. In fact, for any kind of crystal-controlled operation on 80 or 40 at the 75-watt level, it is mighty hard to beat. At catalog prices the cost is less than \$35, and a little judicious shopping and swapping can bring the price down still more.

coil is shorted out when 40-meter operation is desired.

## Construction

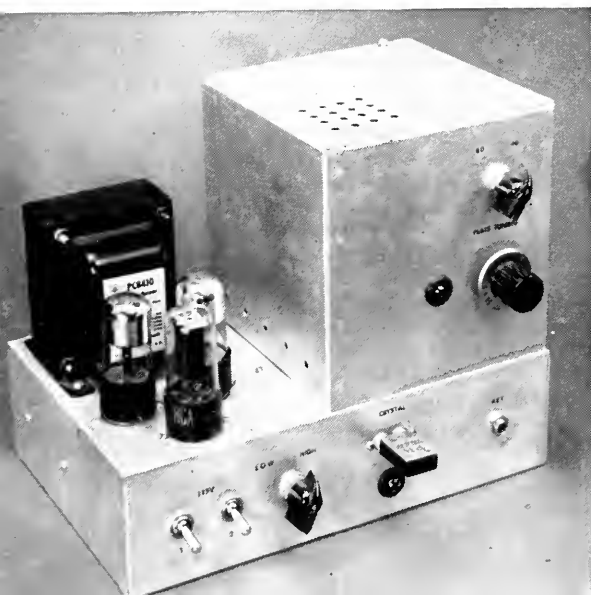
The transmitter is built on an 11 × 7 × 3-inch aluminum chassis and the 6146 and r.f. components above deck are shielded by a 6 × 6 × 6-inch aluminum box. If one lives in an area where there is no danger of TVI, the tube and other parts above chassis could be left unshielded. The controls could be mounted on a panel. However, because TVI must be considered, the construction shown here takes care of the bugaboo.

The transformer and rectifiers are mounted on the chassis top at one end. The other power supply components;  $T_1$ ,  $L_4$ , the 8- $\mu$ f. electrolytic capacitors and the 20,000-ohm 10-watt resistors, are mounted below deck.

The 6146 socket is mounted 1½ inches in from the front of the chassis and 4½ inches from the end. Two 1-inch isolantite standoffs are used to support  $L_2L_3$ , and they are mounted 2¼ inches apart. The rear one is 2⅝ inches from the chassis back and 2 inches from the side.

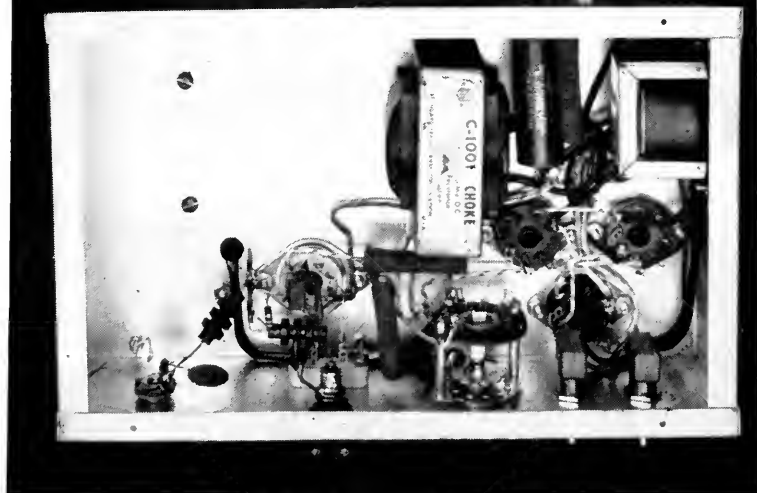
A row of ¼-inch holes is drilled near the bottom on both sides of the cover box to permit

Pictured is the completed 6146 rig. The plate-current indicator lamp is to the left of the tuning knob. In areas where TVI is likely to be a problem, a metal bottom plate should be used in addition to 6 × 6 aluminum box shown.



**QST for**

Bottom view of the one-tube transmitter. The 6.3-volt filament transformer is mounted on the side of the chassis at the upper right-hand corner. To the left of the transformer is one of the 8- $\mu$ f. electrolytics; the other electrolytic is not visible, being mounted behind the power-supply choke coil.



ventilation of the compartment. Several  $\frac{1}{4}$ -inch holes are also made in the box top directly over the 6146.

### Wiring

The power supply is wired first. The center taps of  $T_1$  and the high-voltage winding of  $T_2$  are connected together and soldered to the low-voltage terminal of  $S_3$ . A lead is connected from

one of the 5Y3 filament terminals to the high-voltage terminal on  $S_3$ . One lead from  $L_4$  is connected to the arm of  $S_3$ . Many Novices may wonder why the two 8- $\mu$ f. electrolytic capacitors are connected in series. This is to double the working voltage of the filter.

Next, the below-chassis portion wiring of the r.f. section is completed. The oscillator will work with less capacity for  $C_1$  but the crystal current is

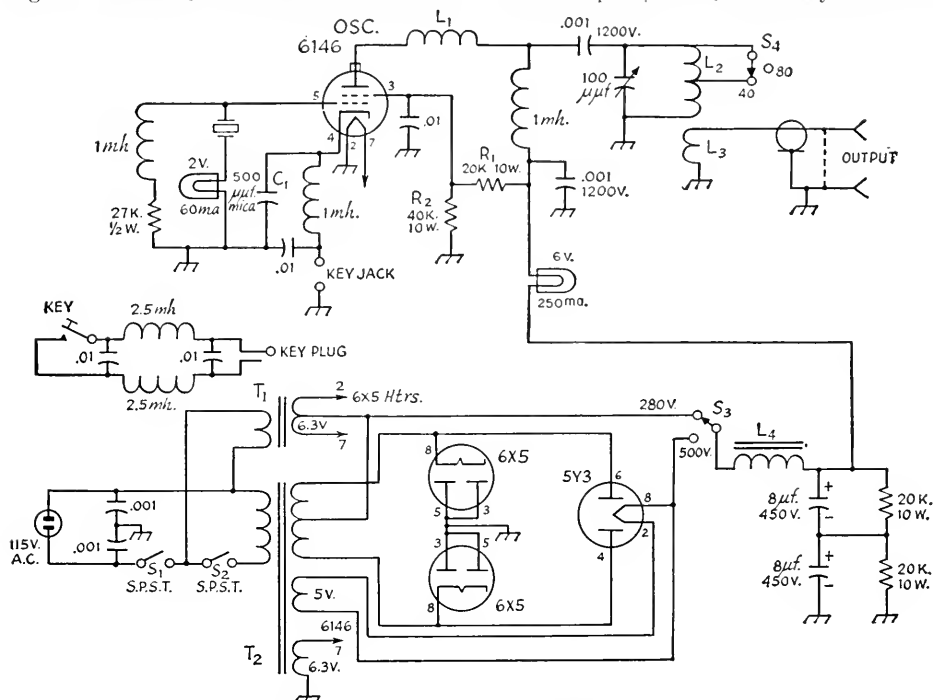


Fig. 1 — Circuit diagram of the 6146 oscillator.

$L_1$  — 1.8  $\mu$ h. (Ohmite Z-144) choke.

$L_2, L_3$  — See text and photograph.

$L_4$  — 10.5 henrys, 110 ma., 225 ohms.

$S_3$  — 1-pole 6-position (2 used) wafer switch, non-shorting (Centralab 1401).

$S_4$  — 1-pole 6-position (2 used) steatite wafer switch, nonshorting (Centralab 2501).

$T_1$  — Filament transformer, 6.3 volt, 1.2 amp.

$T_2$  — Power transformer, 360-0-360 volts, 120 ma., 6.3 volts 3.5 amp., 5 volts 3 amp. (Stancor PC8410).

Unless otherwise specified, all capacitor values are given in microfarads. Fixed capacitors except 8- $\mu$ f. electrolytics and  $C_1$  are disc ceramic.

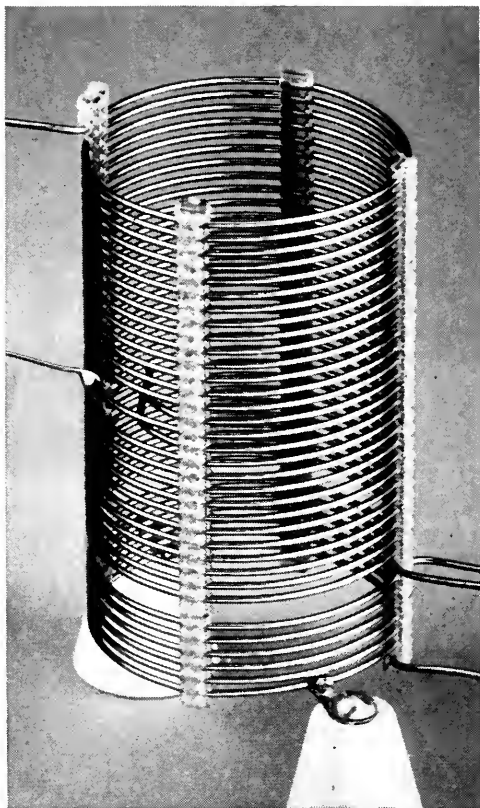
likely to run higher than desired. No socket should be used for the 2-volt 60-ma. dial lamp in series with the crystal. A  $\frac{5}{8}$ -inch rubber grommet is used to hold the dial lamp in place. The inside diameter of the grommet is  $\frac{3}{8}$  inch, just large enough to accommodate the glass envelope of the lamp. Connections are made to the lamp by soldering leads to the base point and to the metal shell. The lead from the shell connects to the chassis.

Standard coil stock (B & W 3900, 2-inch diam., 8 turns per inch, No. 14 wire) is used for  $L_2L_3$ . A total of 38 turns is cut from the original stock. At one end of the piece, a single turn is unwound from the support bars. From this end, count up  $7\frac{1}{2}$  turns and cut the seventh turn. The cut should be made at the support bar opposite the bar from which the first lead extends. The leads from the cut point are separated from the side support bars and brought around to the same bar as the first lead. At the other end of the coil, which will be the top, a lead is unwound from the support bars and extends from the bar opposite the one with the three leads. This coil is shown in one of the photographs.

Counting from the top, the 15th and 17th turns are bent in, allowing access to the 16th turn. This is for the 40-meter tap. A four-inch length of wire can be soldered to this point. The other end will connect to the switch terminal on  $S_4$ .

The coil is supported on the isolantite standoffs by two soldering lugs. The small ends of the lugs are first bent around the bottom turn. Before soldering them in place, the large holes in the lugs should be located over the holes in the standoffs for proper alignment.

A coax receptacle is mounted on the back of the shield box and positioned so that the terminal is opposite the ungrounded end of link  $L_3$ . The switch and capacitor can be mounted in the box first and then wired. However, it will probably be easier for the beginner to wire all the components first, and then mount them in the box. Three holes are needed in the front of the shield box. The capacitor and switch holes are  $1\frac{1}{2}$  inches in from the side of the box and  $2\frac{1}{4}$  and  $4\frac{1}{2}$  inches



Close-up view of the coil construction.

from the bottom, respectively. The hole for the  $\frac{5}{8}$ -inch grommet is 2 inches to the left of the capacitor hole. With the holes cut in the box, it is easy to fit the box over the wired parts.

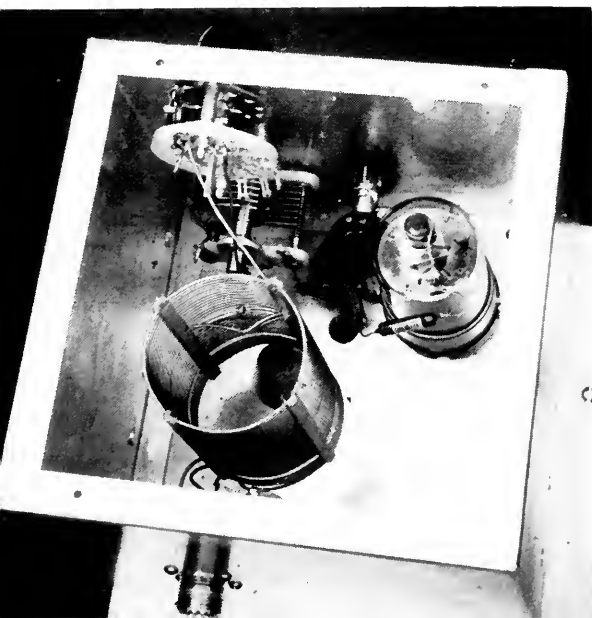
When mounting the glass bulb of the plate circuit 6-volt dial lamp in its grommet, be careful that none of the metal parts of the bulb base come in contact with the metal of the box. If the bulb shorted to chassis ground, the power supply might be damaged. If the builder desires, a 200- or 250-ma. milliammeter can be substituted for the bulb.

It was found in initial tests with the unit described here that a bad v.h.f. parasitic was present. This was eliminated by using an Ohmite Z-144 choke in series with the plate lead at the plate of the tube.

#### Testing the Transmitter

After the unit is wired it is ready for testing. However, before turning on the power, a key-click filter should be made up for the key. It is

(Continued on page 118)



Looking down into the oscillator compartment. Details on constructing and mounting the coil are given in the text and another photograph.

# Portable Antennas for 50 and 144 Mc.

*Come-Apart Arrays for Use Away from the Home Station*

BY EDWARD P. TILTON, W1HDQ

• Mobile operation on 6 or 2 is great stuff, but if you like to work from the mountain tops, or in other choice v.h.f. spots, you'll soon come to the conclusion that you need something better in the way of an antenna system than a vertical whip. Here are portable beams for 50 and 144 Mc. that can be packed in the back of your car and still leave room for the lunch. They can be put up in your favorite location in a matter of minutes.

**E**VEN if you live at the busiest intersection or in the lowest spot in town, you can still have fun on the v.h.f. bands. Pack up your gear and antennas and head for the wide open spaces. Our spring and fall V.H.F. QSO Parties and the Annual ARRL Field Day provide week ends of concentrated v.h.f. operating, and a family picnic at any other time can be combined with an expedition to some choice v.h.f. spot.

This calls for antennas that can be erected and dismantled easily. The arrays for 50 and 144 Mc. shown here can be stowed in the back of almost any car, even with only partial dismantling. The quick method leaves the 2-meter antenna assembled, and merely involves removing extensions from the 6-meter elements. In this form the antennas and supporting mast can be assembled, ready for use in your favorite v.h.f. location in less than five minutes. If you require a smaller package, removing a few screws and folding the 2-meter elements permits packing the works in a space five feet long and about six inches square. From this stage to on-the-air might take a matter of 10 minutes, at the most.

The beams are not intended to be world-beaters. The real v.h.f. expedition enthusiast will want something better, but these antennas do surprisingly well in a good location. The 6-meter array has a driven element and director, both 3-piece elements. The 2-meter job is a cut-down TV array originally made for Channel 6. Its elements fold back against the boom, if necessary. Both antennas use gamma-match feed for either 52- or 75-ohm coaxial line.

## ***A Quick-Up Support***

A convenient support can be made from 1½-inch aluminum TV masting. Two 10-foot lengths were purchased and cut in half. One 5-foot piece was cut for the 6-meter boom and the other three are our mast. The bottom section is fastened to the door handle with a sheet aluminum clamp similar to those described for assembling all-metal v.h.f. arrays shown in all recent editions of

the *Handbook*. No dimensions are given here, as requirements are likely to be different for other makes of cars. A sample clamp can be made of stiff paper or from flashing copper, and this used as a template for making the real thing out of 3 32-inch sheet aluminum.

In the photograph only two mast sections are shown in use, but in many locations the full 15 feet may be desirable, particularly if there are low obstructions in the immediate vicinity of the car. Checks in wide-open spots have shown that there is not a great difference between the 10- and 15-foot heights otherwise. There is more variation in driven-element impedance at the lower height as the antenna is rotated, but performance is not seriously affected.

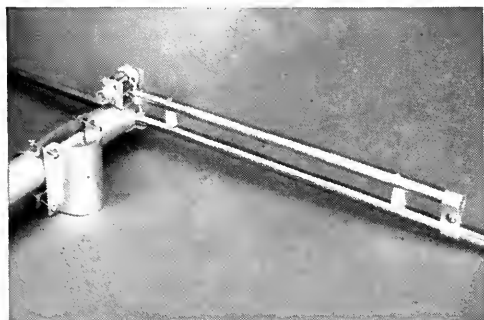
To provide a stable support without guying, the bottom of the mast must be anchored thoroughly. We usually run an old screwdriver into the ground and slip the mast over it. If the car is parked on a hard surface, the mast can be held firm by placing some large rocks around the base.

A helpful feature, added to the mast after the photograph was made, is a ¼-inch bolt 6 inches long, run through the second mast section. A piece of the half-inch element stock 4¼ inches long is slipped over the bolt when it is inserted, leaving a quarter inch for tightening the nut on



The portable 6- and 2-meter arrays ready for use. They are shown here on a 10-foot support, but another 5-foot section can be added without need for guying.

the other side of the tubing. The telescoping portions of the masting are 6 inches long. If this bolt is run through the outer tubing exactly 6 inches from the end it will provide a bearing for supporting the weight of the antenna, as well as serving as a turning handle and direction indicator. The



Close-up view of the matching device on the 50-Mc. driven element. The series capacitor and the coaxial fitting are mounted on a small U-shaped bracket. If the elements are to be removed from the boom for carrying, the screw and nut holding the connection to the matching section can be removed. The mounting clamps must also be removed from the center section of each element in this case. Ordinarily, the boom and two center sections are left assembled for carrying in the car.

latter assumes that the bolt is lined up with the booms of the antennas. The "direction indicator" is no gag. Looking up at the beam elements after dark is likely to be rather confusing.

### Beam Details

The 6-meter array was held to two elements for light weight and compact design. Even this simple antenna will be a great improvement over anything in the way of a strictly mobile set-up. Hilltop checks with horizontally polarized fixed stations indicate an average gain of 25 to 30 db. over the quarter-wave whip normally used for mobile work. If the fixed stations were vertically polarized the story would be quite different, but as practically all 6-meter work is done with horizontal beams today, the portable array enjoys a tremendous advantage over a vertical whip.

Construction follows the all-metal technique outlined in the v.h.f. antenna chapter of all recent editions of the *Handbook*. The boom, made from the leftover piece of masting, is 36 inches long. The director and driven element are 34 inches apart. They pass through the boom and are held in place by semicircular clamps of sheet aluminum. There must be solid contact between the boom and elements, otherwise reception will be noisy when the elements flutter in the wind.

We used half-inch dural tubing, but the size is not critical. Anything up to one inch can be run through 1½-inch tubing. The center sections of both elements are 36½ inches long. Two more 36½-inch sections are added to the driven element, while the director extensions are 34 inches. An alternative method would be to make the center section of the director 31½ inches long, in which case the extensions would all be the same length and interchangeable.

Inserts about four inches long, for taking the extensions, were turned down from aluminum rod. If a lathe is not available for this work, the extensions can be attached by the sleeve method outlined in all recent *Handbooks*. Pieces of the element tubing about 6 inches long are sawed lengthwise, taking out enough of the material so that the remainder can be compressed to make a tight fit inside the tubing. These are inserted into both ends of the center sections to a depth of three inches, leaving three-inch exposed portions onto which the extensions are slipped. The abrasive nature of aluminum tends to make the parts hold together tightly enough for the purpose, without fastenings, even after considerable use. The writer has used the compressed-sleeve method in portable antennas for years, and found it quite adequate for the purpose. It is most satisfactory with elements of ¾-inch or larger diameters, when the beam is for 50 Mc. or lower frequencies. Smaller diameters and thin-wall tubing are satisfactory for 144 Mc. or higher.

The 6-meter boom is held to the support by the familiar aluminum clamp. Again, as tubing sizes may vary, no dimensions are given. Suitable dimensions are arrived at most readily by the template method already outlined. The clamp assembly is held together with No. 8 machine screws, the ends of which were swaged in a vise after the nuts were run on part way. Two of the four screws required for the door-handle clamp can be swaged in this way, also, leaving only two nuts that must be removed in taking the assembly apart for ordinary carrying. If the arrays are to be completely dismantled, removal of six more screws will do the job.

The simplest way to make a 2-meter antenna is to cut down a Channel 6 TV Yagi. The one we used was originally a 5-element job having a folded-dipole radiator. The boom was too long to fit in the back of our car, so it was cut down to a 4-element antenna. The spare director element was then made into a gamma-matched dipole, which was installed in place of the folded dipole originally used for the driven element. Many TV Yagis are supplied with elements that fold back against the boom, a mechanical arrangement that is ideal for portable use. Spacing of the elements is not particularly critical. The Channel 6 spacings may be used for 144 Mc., also, though the array can be revamped to *Handbook* dimensions if you like.

Element lengths were cut to *Handbook* dimensions. As has been done many times before, we experimented a bit with adjustable elements and came to the conclusion that there was little to be gained from attempting to tune up the system, except for the matching adjustments, which will be detailed later. The length of the driven element in inches is found by dividing the number 5540 by the frequency in megacycles. The reflector is 5 per cent longer, the first director 5 per cent shorter, and the forward director 6 per cent shorter than the driven element. This applies to both the 50- and 144-Mc. arrays. Final dimensions we used were as follows: Driven element —



38 inches; reflector — 40 inches; first director — 36 inches; forward director — 35¾ inches. This gives fairly uniform performance from 144 to 146 Mc. Both gain and front-to-back ratio fall off slightly, but not seriously, above the middle of the band.

### Adjustment

Details of the gamma matching systems are shown in close-up photographs. A section of tubing or rod similar in size to the driven element is mounted on one side of the element and parallel to it with small cone stand-off insulators. An adjustable aluminum clamp makes contact between the matching section and the main element, the point of connection being moved until the best possible impedance match is achieved. A series tuning capacitor is connected between the matching section and the inner conductor of the coaxial line, to tune out the reactance of the matching section.

The gamma section is 12 inches long on the 50-Mc. array and 6 inches on the 144-Mc. one. A series capacitor of 50  $\mu\text{mf}$ . will do for either array. The spacing of the capacitor may be small, as the r.f. voltage is very low at this point. Even the smallest available capacitor, the Hammarlund type MAPC-50, is suitable for the low power generally used in portable work. If you're worried about the effects of moisture, a piece of plastic film may be wrapped around the tuning capacitors when the arrays are used in rainy weather.

There is only one way to adjust a matching system and be sure that you're doing it properly, and that is with a standing-wave bridge. The point of connection between the gamma section and the driven element should be set at about 4 inches for the 2-meter antenna or 10 inches for the 6-meter one. The series trimmer capacitor is then adjusted for minimum reflected power. If the indication will not drop to zero or very close to it, try moving the connecting clip, retuning the series capacitor for each new setting of the clip. Be sure that the clip is making a clean tight contact on each test position, or it will be impossible to obtain a good match. Good contact in the coaxial cable connectors is also extremely important. We had plenty of trouble in the initial stages of the project as the result of the outer conductor of our coax making poor contact to the connector sleeve.

A rough approximation of the correct setting can be made by adjusting the gamma match and series capacitor for maximum field-strength indication, but the field-strength meter method is the hard way. The lowest possible s.w.r. may not be too important, with the short run of coax used in a portable setup ordinarily, but the bridge method is so simple and exact that it should be used wherever possible.

### Some Random Ideas

Portable antenna design is a fruitful field for the gadgeteer, and there are countless ways the job can be done. Perhaps you want to use the

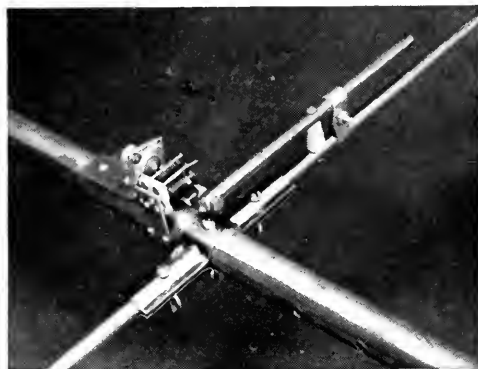
folded-dipole feed system that came on the TV antenna originally. All right, just use a coaxial balun and 72-ohm coaxial line. If the TV antenna was designed for 300-ohm feed, the balun will give you a good match.

Maybe you'd like to stack two antennas for 144 Mc. In that case, if each array has folded-dipole feed designed for 300-ohm line, space the two arrays 80 inches apart and feed through a balun at the midpoint of the open-wire phasing line. The balun and transmission line should be of 50-ohm coax in this case. This will not provide a perfect match, but it will be close enough for the purpose. If you want a better match, connect a shorted quarter-wave stub at the feed point and then slide the balun up on this stub for lowest s.w.r.

For more gain on 50 Mc., add more elements, following *Handbook* dimensions for element lengths and spacings. The gamma match arrangement will work well with any number of elements.

Your car bulges below the door handles? There are many other ways to anchor the support. WIDNE and WIVLIH use their bumper jack, tying the vertical support to the jack with webbing straps. This puts rotation of the array out of reach of car occupants, but it has the advantage of leaving all doors free.

You want to work 10 meters too? The 6-meter driven element can be made into a 10-meter di-



Details of the 2-meter gamma match. The series capacitor is mounted at right angles to the boom in this case, as adjustment is done from the side of the array instead of the end. Elements can be folded back against the boom if the array must be packed away in a small space.

pole by a little revision of the length of the center sections, so that all four extensions can be plugged together to make a dipole 16 feet long. Make the gamma section longer, in this case, to permit adjustment for 28 Mc.

Or take any of these ideas and add some more of your own. The point is that operating v.h.f. gear away from your home location in some high clear spot far from city noises is lots of fun. If you have a top-notch home-station setup, the chances are that you'll never work as far with the portable gear as you can from home, but there's something about portable operation that gets into one's blood, even so. Try it, and see!

# The Automobile Storage Battery and Its Charging System

## *Principles and Limitations of Car Power Plants*

BY DONALD MIX, WITS

• The success of any mobile installation depends to a large extent upon intelligent use and maintenance of the car's storage battery and charging system. Included in this article is a discussion of the principles of charging-regulator circuits.

**E**LECTRICAL power for motor cranking and for operating lights and accessories in a car when the motor is idle is furnished by a storage battery. Unlike a dry battery, which must be replaced when it is discharged, the storage battery may be recharged hundreds of times before its useful life is ended. The charging is done automatically when the engine is running by means of a generator belt-driven from the crankshaft of the motor.

The storage battery is made up of units consisting of a pair of coated lead plates immersed in a solution of sulphuric acid and water. The basic unit delivers a nominal voltage of 2. The number of watt-hours (watts  $\times$  hours) that may be drawn from the battery before recharging is necessary is increased by enlarging the plate area and by connecting units in parallel. Such an assembly is called a cell. Cells, each of which delivers about 2 volts, can be connected in series to obtain the desired battery voltage. A 6-volt battery therefore has three cells, and a 12-volt battery has 6 cells. The average stock car battery has a rated capacity of 600 to 800 watt-hours, regardless of whether it is a 6-volt or 12-volt battery. Special heavy-duty batteries with larger capacities are available.

### *Specific Gravity and the Hydrometer*

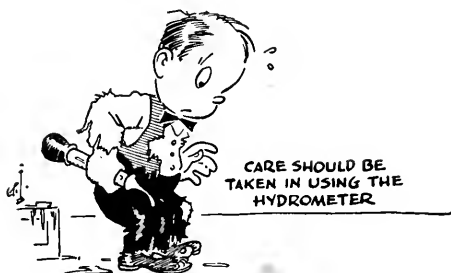
The electrical power delivered by a storage battery is a result of chemical action between the sulphuric acid in the solution (electrolyte) and the lead plates. As power is drawn from the battery, the acid content of the electrolyte is reduced. The acid content is restored to the electrolyte (meaning that the battery is recharged) by passing a current through the battery in a direction opposite to the direction of the discharge current. The positive terminal of the charger is connected to the positive terminal of the battery. The positive terminal of the battery is usually identified by a  $+$  mark and is of slightly greater diameter than the negative terminal.

Since the acid content of the electrolyte varies with the charge and discharge of the battery, it is

possible to determine the state of charge by measuring the specific gravity of the electrolyte. Specific gravity is the ratio of the weight of a unit volume of electrolyte to the weight of an equal volume of water.

An inexpensive device for checking the s.g. is the hydrometer which can be obtained at any automobile supply store. The hydrometer consists of a calibrated glass float within an outer glass tube that is fitted at one end with a rubber suction bulb, and with a rubber nozzle at the other. Each cell of the battery has a removable cap giving access to the electrolyte. In checking the s.g., enough electrolyte is drawn out of the cell and into the hydrometer so that the calibrated bulb floats freely without leaning against the wall of the glass tube. The hydrometer should be held in a vertical position at eye level and a reading taken at the surface level of the electrolyte.

Care should be taken in using the hydrometer because the acid is harmful to the skin and clothing as well as to battery terminals and metal parts of the car. The electrolyte should be returned to the cell after testing. Each cell should be tested in turn.



While the readings will vary slightly with batteries of different manufacture, a reading of 1.275 should indicate full charge or nearly full charge, while a reading below 1.150 should indicate a battery that is close to the discharge point. More specific values can be obtained from the car or battery dealer.

These readings are normal for an electrolyte temperature of 80 degrees F. For extremes of temperature, 0.004 should be added to the reading for each 10 degrees of temperature above 80 degrees, or subtracted for each 10 degrees below 80 degrees. Some hydrometers have built-in thermometers that simultaneously check the temperature of the electrolyte. The

s.g. reading of all cells in a battery should be alike within 0.025.

Readings taken immediately after adding water, or shortly after a heavy discharge period will not be reliable, because the electrolyte will not be uniform throughout the cell. The battery

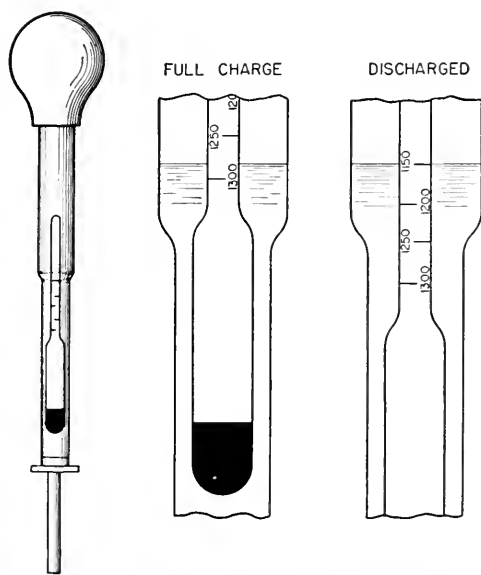


Fig. 1—Sketches of the hydrometer showing (A) the position of the calibrated float when the battery is near full charge, and (B) when the battery is almost completely discharged.

should be allowed to stand for several hours before taking the reading. Charging will speed up the equalizing, and some mixing can be done by using the hydrometer to withdraw and return some of the electrolyte to the cell several times.

A battery should not be left in a discharged condition for any appreciable length of time. This is especially important in low temperatures when there is danger of the electrolyte freezing and ruining the battery. A battery discharged to an s.g. of 1.100 will start to freeze at about 20 degrees F., at about 5 degrees when the s.g. is 1.150 and at 16 below when the s.g. is 1.200. There should be no danger of freezing if the s.g. is kept at 1.250 or higher.

If a battery has been run down to the point where it is nearly discharged, it can usually be fast-charged at a battery station. Fast-charging rates may be as high as 80 to 100 amperes for a 6-volt battery. Although a discharged or nearly discharged battery cannot be brought back to full charge by fast charging, it can be brought back to useful condition within a short time. Any 6-volt battery that will accept a charge of 75 amperes at 7.75 volts during the first 3 minutes of charging, or any 12-volt battery that will accept a charge of 40 to 45 amperes at 15.5 volts, may be safely fast-charged up to the point where the gassing becomes so excessive that electrolyte is lost or the temperature rises above 125 degrees. If the battery requires more than the above values of

voltage to produce the currents specified, fast-charging should be done with caution to avoid excessive heating.

A normal battery showing an s.g. of 1.150 or less may be fast-charged for 1 hour. One showing an s.g. of 1.150 to 1.175 may be fast-charged for 45 minutes. If the s.g. is 1.175 to 1.200, fast-charging should be limited to 30 minutes.

### Care of the Battery

The battery terminals and mounting frame should be kept free from corrosion. Any corrosive accumulation may be removed by the use of water to which some household ammonia or baking soda has been added, and a stiff-bristle brush. Care should be taken to prevent any of the corrosive material from falling into the cells. Cell caps should be rinsed out in the same solution to keep the vent holes free from obstructing dirt.

All connections to the battery and along the battery line to the starter and transmitter should be inspected regularly for loose or corroded connections. Battery terminals and their cable clamps should be polished bright with a wire brush, and coated with mineral grease. Solid connections and adequate cable size in the battery circuit are of great importance. A 150-watt load on a 6-volt battery represents a load resistance of only  $\frac{1}{4}$  ohm. If connection and lead resistances amount to as much as  $\frac{1}{4}$  ohm, the power delivered to the load will be only one fourth of that delivered with zero loss resistance, and only half of the power actually drawn from the battery will be dissipated in leads and connections.

The hold-down clamps and the battery holder should also be checked occasionally to make sure that they are tight so that the battery will not be damaged by pounding when the car is in motion.

### Voltage Checks

Although the readings of s.g. are quite reliable as a measure of the state of charge of a normal battery, the necessity for frequent use of the hydrometer is an inconvenience and will not always serve as a conclusive check on a defective battery. Cells may show normal or almost normal s.g. and yet have high internal resistance that ruins the usefulness of the battery under load.

When all cells show satisfactory s.g. readings and yet the battery output is low, service stations check each cell by an instrument that measures the voltage of each cell under a heavy load. No-load voltage measurements usually are meaningless because it requires a large current to detect the difference in internal resistance between a normal cell and one that is defective. Under a heavy load the cell voltages should not differ by more than 0.15 volt.

A load-voltage test can also be made by measuring the voltage of each cell while closing the starter switch with the ignition turned off. In many cars it is necessary to pull the central distributor wire out to prevent the motor starting.

If the battery is down so far that it will not turn the cranking motor, this voltage check can still be made. The average cell of a fully-charged battery on discharge while cranking should measure about 1.95 volts at 80 degrees, or 1.4 volts at 0 degrees. A defective cell will show up quite readily by a voltage reading noticeably below the readings of the other cells.

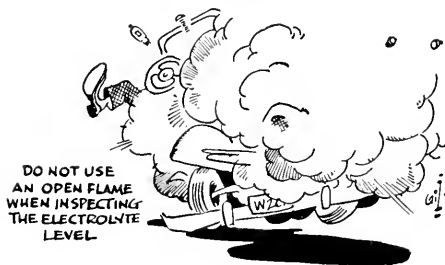
As the normal battery approaches discharge, its internal resistance increases so that the difference between no-load and loaded voltages becomes greater. A d.c. voltmeter with a scale of 10 for a 6-volt system, or 25 for a 12-volt system, mounted on the instrument panel and connected to the battery terminals, may be used to provide a continuous check on the condition of the battery. The most significant readings, of course, will be those made with the transmitter operating and with the car motor turned off. Experience will show the normal drop in battery-terminal voltage to be expected when the transmitter load is turned on. Voltage readings can be correlated with readings of specific gravity so that eventually the operator should be able to estimate the state of charge of the battery with only an occasional check with the hydrometer.

### Electrolyte Level

Water is evaporated from the electrolyte, but the acid is not. Therefore water must be added to the solution in each cell from time to time so that the plates are always completely covered. Since the introduction of the charging regulator several years ago, the most frequent cause of subnormal battery life is failure to maintain proper electrolyte level. The level should be checked at least once per week, especially during hot weather and constant operation.

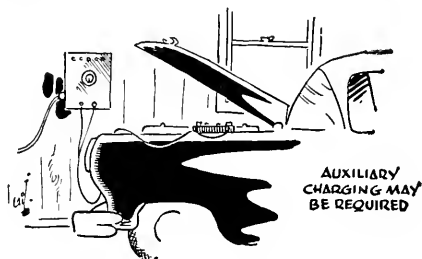
Distilled water is preferred for replenishing, but clear drinking water is an acceptable substitute. Too much water should not be added, since the gassing that accompanies charging may force electrolyte out through the vent holes in the caps of the cells onto the surface of the battery. The electrolyte expands with temperature. If a battery is replenished when the electrolyte is at 80 degrees, the level may fall off as much as  $\frac{3}{16}$  inch when the temperature drops to 0 degrees. Conversely, if the electrolyte is replenished at 0 degrees, the cell may overflow at higher temperatures.

*Do not use an open flame when inspecting the electrolyte level, since the chemical action develops hydrogen gas which is highly explosive.*



### Cranking Power

It requires about 65 per cent more power to crank a motor at 32 degrees than at 80 degrees, and about 250 per cent more at 0 degrees. At the same time, the cranking power delivered by a fully-charged battery at 32 degrees is reduced to about 65 per cent of that delivered at 80 degrees, and to about 40 per cent at 0 degrees. A cranking motor will draw from 125 to 300 amperes at 6 volts in summer and 300 to 700 amperes in winter.



### Auxiliary Charging

Because a car may not be driven sufficiently to keep the battery charged, auxiliary charging from an external source may be required from time to time. Battery chargers of various types are on the market and can be installed in the garage so that the battery can be charged during the night. It is not necessary to remove the battery from the car. A battery is fully charged when the electrolyte shows no increase in s.g. over a 3-hour period.

### Battery-Charging System

In the normal stock installation, the car battery is charged by a d.c. generator driven by a belt from the motor crankshaft. The output of the generator is governed by a regulator usually consisting of three relays.

The cutout relay is for the purpose of disconnecting the generator from the battery when the generator is not operating, to prevent the battery discharging through the generator windings. The contacts of the cutout relay are in series with the ungrounded wire between the generator output (armature) terminal and the battery. When the car motor turns the generator over at sufficient speed to develop a voltage greater than the battery voltage, the contacts close and the generator is connected to the battery. When the motor is slowed down, and the generator voltage falls below the battery voltage, the contacts open, disconnecting the generator from the battery.

The current-regulator relay is for the purpose of protecting the generator against overload. Its contacts are connected across a resistor in series with the field winding of the generator. When the load on the generator exceeds the current value to which the regulator has been set, the contacts open and close, intermittently inserting the resistor in series with the field winding at a rate that limits the average output current to a

value that is safe for the generator to handle. Some older-model cars do not have this current-regulator unit.

The purpose of the voltage-regulator relay is to assure adequate battery charging, while preventing damage to the battery from overcharge. Its contacts are also connected across a resistor in series with the field winding of the generator. When properly adjusted, it will regulate the average generator output voltage so as to cause the battery charging current to rise to a value near the maximum safe limit set by the current regulator, and taper off almost to zero current as the battery nears full charge. The life of the battery is highly dependent upon proper adjustment of the voltage regulator.

The design, operation and adjustment of charging regulators vary appreciably among the various makes and models. Proper adjustment requires special data, gauges and instruments not often in possession of anyone but qualified electro-motive service shops. The critical setting of several spacings according to manufacturer's specifications is required. It is seldom a simple matter of tightening or loosening the tension of a spring. An amateur who makes a mobile installation should ask the service shop to check the adjustment of the current regulator to make sure that it is set for the maximum output current for which the generator is rated. This will permit maximum safe output from the generator when operating from the car motor, and will allow maximum control of the charging rate by the voltage regulator.

In general, there is little to be gained by a readjustment of the voltage regulator from its original proper setting, although it would be well to have a service chop check the adjustment periodically to maintain the proper adjustment. Voltage-regulator operation depends to a large extent upon the difference between the battery and generator voltages at any given time. So long as the load current drawn does not exceed the current limited by the current regulator, the battery voltage will be unaffected, and the voltage regulator will control the battery charging current in the normal way. If, however, the total current drawn from the system exceeds the current for which the current regulator is set, the current from the generator will be limited by the current regulator, not by the voltage regulator, and the extra current will be drawn from the battery.

When the external load is removed, the voltage regulator will act in normal fashion, causing the charging current to rise to maximum until the battery is again near full charge. Setting the voltage regulator to a higher limiting voltage will not speed up the recharging, because the charging current is limited by the current regulator to a value that is safe for the generator, as mentioned previously. Increasing the limiting voltage of the voltage regulator will, however, result in continued charging at an excessive rate after the battery has reached full charge, and this can cause reduced battery life.

## NEW BOOKS

**Yagi-Uda Antenna**, by Shintaro Uda and Yasuto Mushiaki, Tohoku University, Japan. Published by Sasaki Printing and Publishing Co., Ltd., 27 Tsutsumi-dori, Sendai, Japan. Obtainable from Zeitlin & Ver Brugge, 815 N. La Cienega Blvd., Los Angeles 46, California. 183 pages, including index. Schematics.  $6\frac{1}{4} \times 8\frac{1}{2}$  inches. Cloth cover. Price, \$4.00.

This is no doubt the most complete discussion of the parasitic beam originated by Dr. Yagi yet published. The first five chapters are on antenna theory, including treatment of the equivalent radius of various forms of conductors in linear antennas, mutual impedance of parallel antennas, antennas with discontinuous thickness, and the general theory of the Yagi. The remainder of the book — it has thirteen chapters in all — is largely given to the practical design of two- and three-element beams, with sets of graphs useful for design purposes.

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**Television for Radiomen**, revised edition, by Edward M. Noll. Published by The Macmillan Company, 60 Fifth Ave., New York 11, N. Y. Part I, black and white, Part II, color television. Part I, 662 pages, Part II, 108 pages.  $6\frac{1}{2} \times 9\frac{1}{4}$  inches. Price, \$10.00.

This is a comprehensive, descriptive text covering modern television circuits and their operation. Intended as a course for technicians as well as a reference manual, it is distinctly practical in approach and largely nonmathematical in treatment. (A separate chapter on "Practical Television Mathematics" collects the design formulas most frequently used in circuit work.) The revised edition now includes sections on u.h.f. and color.



August 1930

... The "Old Man," describing the Wouff Hong, tells that since the beginning of amateur radio it has meant "the one or the other" — either law and order or the Wouff Hong!

... Harry Wells, W3ZD, relates his exciting operating experiences with the *All-American Lyric Malaysian Expedition* to Borneo. The call used was PMZ.

... "The First Conviction Under the Radio Act," by Porter H. Quinby, W9DXY, tells how St. Louis amateurs cooperated in running down an unlicensed station.

... In "Dummy Antennas," by Guy C. Omer, Jr., W9EBF/W9FSC, a description of a modern dummy load is presented. It incorporates a variable capacitor and iron wire wound on strips of wood.

... ARRL Headquarters station W1MK operates on 3575 and 7150 kc.

... "The Third International Relay Competition," by E. L. Battey, gives a run-down of results of this popular contest. Hats off to W6BAX who hit the jack pot with a sizzling 3210.

... W9DRD gives the low-down on 7-Mc. crystals, the youngest useful members of the piezo family, in this month's Experimenters' Section.

... A pioneer 14-Mc. 'phone station, W9ANZ, Louis F. Leuck operator, is the station of the month. Using a Type '03A in the final and a UV-211 in the modulator, W9ANZ emits an "ear-busting" signal.

# Revision of 6-Volt Equipment for 12-Volt Operation

UNFORTUNATELY, there is no simple and inexpensive way of converting existing 6-volt mobile installations for operation in the newer cars having 12-volt battery and charging systems.

The simplest solution is provided by a dynamotor that has 12-volt input and 6-volt output. Such a dynamotor is produced by the Carter Motor Co., and is called the "Change-a-Volt." It is rated at 15 amperes, 6 volts output continuously for receiver operation, and 45 amperes intermittently for transmitter use. The cost of this unit, however, is comparable with that of a new power unit for 12-volt input. There is also, of

models in each type that are designed for either 6- or 12-volt input. It would be advisable for anyone now contemplating an installation in a car with a 6-volt system to purchase one of the dual-input types to cover future use with a 12-volt system.

## Filaments

You may be lucky enough to find 12-volt equivalents for all of the 6-volt tubes in your installation, but this will rarely be the case. The simplest and most efficient filament conversion consists of dividing the 6-volt tubes into two groups totaling, as closely as possible, the same current. The two groups are then connected in series, as shown in Fig. 1. If the two branches cannot be matched exactly, a resistor should be connected across the branch of lesser current to make the total current of this branch equal the total current of the other. The value of the resistor in ohms should be

$$R = \frac{6.3}{I_1 - I_2},$$

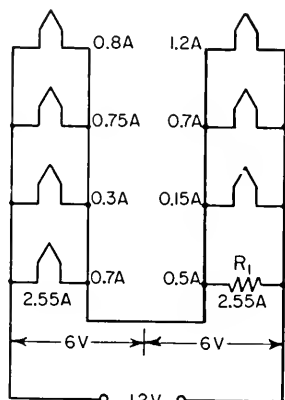
where  $I_1$  is the greater total current and  $I_2$  the lesser, in amperes.

This system can be applied to any number of tubes greater than 1. A single tube will, of course, require a simple series resistor, as shown in Fig. 1B. The value of this resistor in ohms should be

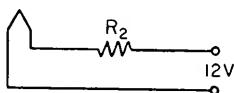
$$R = \frac{6.3}{I},$$

where  $I$  is the rated filament current of the tube in amperes.

In this revision of the filament wiring, it is obvious that only one side of one group of filaments may be grounded to the chassis. One side of this group and *both* sides of the second group must be insulated from the chassis. — D.H.M.



(A)



(B)

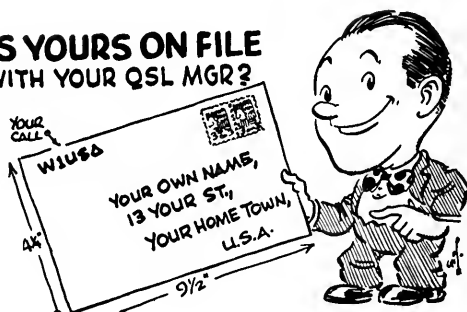
Fig. 1 — (A) — Showing the connection of 6-volt heaters in series-parallel for 12-volt operation.  $R_1$  is used to equalize the currents in the two branches. (B) — A single 6-volt heater will require a series resistor,  $R_2$ , for 12-volt operation.

course, a loss of power in the conversion from 12 to 6 volts.

Both dynamotors and vibrator packs are available from 12-volt input, and there are some

- Most makes of cars are turning to the use of 12-volt electrical systems. This is a definite advantage for heavy loads, such as mobile transmitters. Here are suggestions for operating 6-volt equipment from 12-volt systems.

**IS YOURS ON FILE  
WITH YOUR QSL MGR?**



# A Six-Meter Club Project

## Andrews Electronic Association Builds 50-Mc. Gear on Production-Line Basis

BY JOHN P. DRUMMOND,\* W3YHI

THE Andrews Electronics Assn., Andrews Air Force Base, Md., recently took on the construction of 6-meter rigs as a club project. As a result, eleven stations are making their 50-Mc. debut near Washington, D. C. All but one are entering the v.h.f. ranks through this project, and more are expected to follow shortly.

This work was undertaken as a result of many factors. Members had long agreed that a project was needed to stimulate club interest. There were as many ideas as to what its nature should be as there were club members. Opening of the 6-meter band for Technician operation was then in prospect. AEA had previously considered a 2-meter project to provide improved local communications for the club's "Windbagger's Net" but there was obvious need for more activity on 50 Mc. Previous club experience in sports car races and in providing communications of an emergency nature had emphasized the need for more suitable equipment. The v.h.f. bands appeared to provide the best solution, but none of the equipment owned by the members could be used for v.h.f. work. The 50-Mc. band seemed like the optimum frequency, as it would be easier to construct equipment and better local range could be expected with simple antennas than on 144 Mc. Then there was the technical challenge of potential TVI with fringe-area reception of Channel 2 from Baltimore. AEA's previous stand had been in favor of opening both 2 and 6 meters to Technicians. Although AEA opposed the ARRL position against opening 144 Mc. to Technicians, it accepted the League's decision and was prepared to support the will of the majority actively.

The usual problems were involved in getting a group to tackle a new problem. Again there were nearly as many ideas as members. Some were not interested in 50 Mc.; some had no construction experience; others had no place to work. A questionnaire was made up to determine the general characteristics of the equipment desired by the majority and their willingness to assist each other in a cooperative production-line assembly project. The writer was given the task of designing and building a pilot model of the transmitter. The poll of the members had indicated that a unit of 15 to 20 watts input was desired. It was to be of simple design, rugged, and inexpensive to build, as each member was to pay for his own.

The model transmitter was built and a major portion of one meeting was devoted to an "on-

the-air" 50-Mc. session with W3OJU, during which Rick did an excellent job of answering questions thrown at him by the AEA membership. The thoroughness of W3OJU's sales talk was proven that same night when AEA voted to proceed without delay.

For economy reasons, the transmitter was designed largely around parts stripped from AN/ARC-4s, as we had a source of these units. The final design met the simplicity requirement. It employed a 12AT7 overtone oscillator-doubler driving a 2E26 final amplifier. The modulator is a pair of 6L6s driven directly from the microphone transformer. Input runs around 20 watts. A list was made of the parts and tubes which had to be purchased.

Ten members immediately indicated the desire to build similar transmitters and they put their cash on the line to prove it. The base hobby



The finished product, a 50-Mc. transmitter complete with modulator. The r.f. section is similar to *Handbook* design, but modified to make use of available surplus parts. (USAF photos)

\* % Hq., AACs, AAFB, Washington, D. C.





Members of the Andrews Electronics Assn. who participated in the 50-Mc. transmitter construction project. *Front row, l. to r.:* WN3ZTA, W3URQ, W3RV, W3HGY, M. P. Hixson. *Middle row:* WN3ALG, W3YQV, W3YHI, Major Gikas, W3VBE. *Standing:* W0DDC, W3TPT, W3-WWQ, W3ZQD, W3UBZ, W0QBK.

shop was selected as a site for construction, and one member was nominated to purchase the parts. Special meetings were set up for every Friday night to carry the construction through to completion. The meeting then adjourned and the committees swung into action.

Sufficient ARC-Is were rounded up to provide the parts sources. The writer drafted a step-by-step instruction sheet for removal of the parts to be used, and both were distributed among the members in advance. To the amazement of those who felt that the project would not catch on, more than 75 per cent of the membership showed up the first night, loaded with tool boxes and ready to work. Club Prexy W3TPT staggered in bearing a large carton with the purchased parts and announced that he'd cleaned the local dealers out. The final cost per transmitter was less than \$10.

Workers were assigned to places in a production line headed by W3VBE, who had previously made a template for the chassis. Hacksaws, drill presses and soldering irons were manned and we were under way. The chassis work (usually the toughest construction job) was accomplished in a surprisingly short time as a result of the production-line techniques and the availability of willing hands. All chassis were then run back down the line for the mounting of parts and prefabricated assemblies which had been prepared by other members. Wiring was done by following simple step-by-step instructions prepared by the writer in the manner used by the Heath Co. for their kits.

Although this project is not at this writing fully completed, it has caused considerable comment in the Washington area. A number of requests have been received for information on the transmitter design, method of starting the project, etc. Certainly AEA can expect some TVI cases to pop up, but they will be sought out and treated as necessary. A club project of this sort for 50 Mc. is not, in itself, new. Nothing new in the way of equipment development resulted

from this one. AEA feels, however, that the project has accomplished several very worthwhile things to date. It has proven that a club can take on a project type that is new to its members and in doing so draw the members closer together in the common cause. It has also proven our democratic principles of majority rule can be accepted with good grace and that unity can exist within the amateur ranks — even among those who “lost” an issue.

We'll be seeing you on 50 Mc.

## Silent Keys

IT is with deep regret that we record the passing of these amateurs:

W1AFB, Ray C. Lowery, West Hartford, Conn.  
W2AET, ex-W1CMR, Louis E. Robitaille, Bayside, L. I., N. Y.  
W2LDG, Charles G. Zaepfel, Irvington, N. J.  
WN3BCQ, Glenn C. Bream, Gettysburg, Pa.  
W3GV, ex-W8GU, F. Dawson Bliley, Erie, Pa.  
W3YDI, Robert H. McBride, Butler, Pa.  
ex-W4DBC, Ralph G. Kingston, Ft. Myers, Fla.  
KN6BXD, Robert W. Fuller, Chico, Calif.  
W6OVM, Abraham W. Turkel, San Francisco, Calif.  
W7JTF, William J. Dobyns, Tacoma, Wash.  
W7JFG, Napoleon J. Tremblay, Tucson, Ariz.  
W7NK, Francis J. Brott, Seattle, Wash.  
W7RYP, Chester J. Markl, Phoenix, Ariz.  
W7ZSK, Paul R. Potter, Colville, Wash.  
W8LOH, William H. Sutton, Detroit, Mich.  
W8UZU, William F. Diekmann, Canton, Ohio  
W9AUR, Earl F. Kell, Aurora, Ill.  
W0CFL, Albert W. Hodge, Kansas City, Mo.  
W0PUF, William J. Aitchison, Warren, Minn.  
VE3QB, W. A. Knowles, Lanark, Ont.  
DL3OP, Rudolph Liefand, Rendsburg-Budelsdorf  
DL1XF, Werner Slawyk, Grossheide  
F8AK, Maurice Nardeux, Loches  
F8PH, Marie-Claire Jeannaud, Gujan Mestras, Gironde  
GW5WU, Douglas A. Low, Cardiff, Wales  
OH2ND, Erkki Kairenius, Helsinki  
ON4HD, Henri R. Deceuninck, Emelgem-Izegem  
VU2GB, G. A. W. Ballantyne, Bombay  
YV5BE, Carlos Lenfant, Chacao, Miranda

## • Recent Equipment —

### The Viking Adventurer

THE "Adventurer" is a small transmitter which, while no doubt having special appeal to Novice licensees because it is crystal-controlled and operates at a 50-watt final-amplifier input level, also would be useful as an exciter for a higher-power amplifier in the 3.5- to 28-Mc. bands. The power output should be ample for driving a tetrode of fairly large power input. The aluminum cabinet has been designed for good

passive coupling to the 807 grid is used in the oscillator plate circuit. The 807 plate tank is a pi network with constants selected so that loads ranging 50 to 600 ohms can be fed. In both tanks the various bands are covered by tapped tank coils, the unused portions of which are shorted out by the bandswitch. Both coils are sectional-wound to reduce the coupling between the active and shorted portions and thus minimize losses in

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The "Adventurer" is a two-tube 50-watt input transmitter covering the amateur bands between 3.5 and 30 Mc. The dual-range milliammeter (0-20 and 0-200 ma.) can be switched to read either grid current or plate current in the final amplifier. The control at the upper right is for the 700- $\mu$ f. variable output capacitor of the amplifier pi network. The slide switch just below it cuts a 700- $\mu$ f. fixed capacitor in parallel for additional output capacitance.

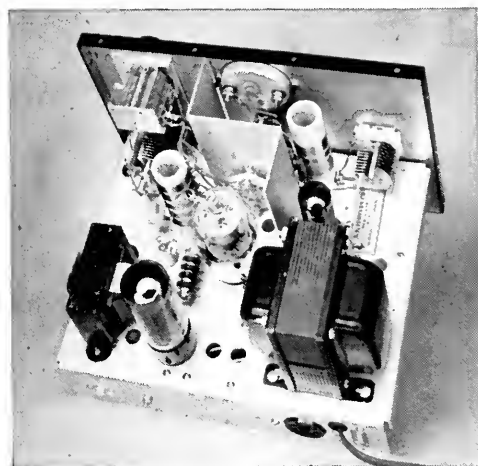
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The oscillator and amplifier tank coils are wound on ceramic forms, with sections for the various bands separated as shown to reduce losses. The higher-frequency sections are space-wound. The phono-type connector at the left on the rear lip of the chassis is for coaxial output from the amplifier tank.

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shielding and the 115-volt and keying leads (the only ones that have external connections) are fitted with harmonic filters for the TV frequencies. The transmitter is available only in kit form, and the only accessories required are a key and crystals.

There are two r.f. tubes, a 6AG7 oscillator and 807 amplifier/doubler. The oscillator uses the Pierce-type circuit with the crystal connected between grid and screen, output being taken from the plate. Conventional parallel tuning with ca-

the "dead" turns. The oscillator and amplifier switch sections are ganged, but are separated by a shield partition to prevent unwanted coupling between the two circuits.

In the main, the r.f. circuits conform to standard practice and are quite straightforward. The oscillator operates straight-through on the 3.5-Mc. band, 80-meter crystals being specified (although presumably a 160-meter crystal could be used for this band if one happens to be available). For 7-Mc. operation, either 80- or 40-meter crys-

tals may be used, with frequency doubling in the oscillator plate circuit in the former case. Forty-meter crystals are recommended for 14-Mc. and higher-frequency operation; the oscillator doubles for 14-Mc. operation, triples for 21 Mc., and doubles for 27-28 Mc., where the 807 is also used as a frequency doubler. On 21 Mc. and all lower-frequency bands, the 807 operates as a straight-through amplifier. Since the driving power tends to become excessive on the lower frequencies, a 2700-ohm 1-watt resistor is connected between the 21-Mc. tap and the cold end of the oscillator tank coil (shorting for the higher frequencies moves progressively from the cold end) to absorb some of the excess power. This arrangement results in reduced "swamping" by the resistor on 14 Mc. particularly, and cuts out the additional loading entirely on 21 Mc.

Simultaneous cathode keying of both tubes is used in the "Adventurer." There is no built-in provision for shaping of the keying waveform. VFO-input terminals are provided, connecting

between the 6AG7 stage grid and ground.

Plate and heater power are both obtained from the same power transformer. The rectifier is a 5U4G, working into a capacitor-input filter consisting of two capacitors and a choke. The output voltage is approximately 450 at a full-load current of 150 ma. Power leads are brought out to an octal socket on the rear chassis apron so the power supply can be used for other purposes if desired. The transmitting tubes remain connected under these conditions, but the full d.c. output is available for external use if the key is left open. To use the maximum available heater current of 2 amperes externally requires removing the oscillator and amplifier tubes from their sockets. The same "accessory" socket can be used to operate a device of low power consumption, such as a VFO, with the transmitter in full operation.

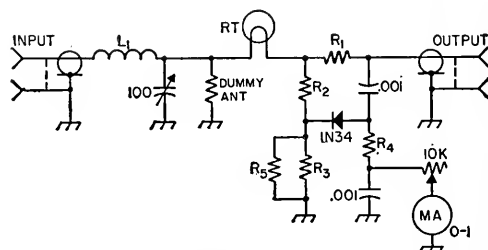
The panel size is  $7\frac{3}{8}$  by  $10\frac{3}{8}$  and the transmitter is  $8\frac{1}{8}$  inches deep. Like other Viking units, the "Adventurer" is a product of the E. F. Johnson Company. — G.G.

## Models 650 and 651 Matchmasters

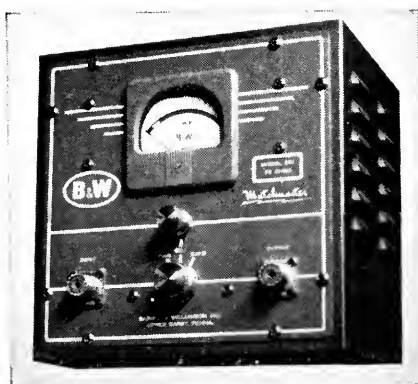
THE B & W "Matchmaster" is a piece of test equipment incorporating a dummy antenna, standing-wave ratio bridge, and r.f. power meter in one unit. It is made in two impedance levels matching the two commonly-used types of coaxial line, Model 650 being set up for 52-ohm lines and Model 651 for 73-ohm lines. The dummy antenna, which uses noninductively-wound wire resistors, has a continuous rating of 100 watts and an intermittent rating of 125 watts. Power in the dummy antenna is measured by means of a rectifier-type voltmeter, using a 1N34, connected through a voltage divider across the dummy load.

The essentials of the dummy antenna and s.w.r.-bridge circuits are shown in the accompanying diagram, in which the power-reading voltmeter and switching details have been omitted. One interesting feature is the compensating cir-

cuit for the dummy load, consisting of  $L_1$  (2 spaced turns  $\frac{3}{4}$  inch in diameter) and the 100- $\mu$ mf. variable capacitor. The purpose of this circuit is to reduce reactive effects, particularly at the high-frequency end of the useful range of the instru-



Basic circuit of the "Matchmaster" dummy antenna and s.w.r. bridge.



The "Matchmaster" is a combination of dummy antenna, r.f. wattmeter, and s.w.r. bridge, and is useful for testing and adjustment of transmitters and antenna systems. Dimensions are  $8\frac{1}{4}$  by  $8\frac{1}{4}$  by  $6\frac{1}{4}$  inches.

ment, and to provide a means for adjusting the resistance to the proper value. The adjustment is an internal one and is made at the factory.

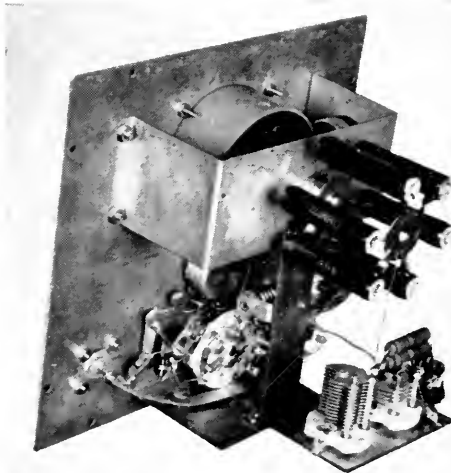
The s.w.r. indicator uses the well-known resistance-bridge circuit.  $R_1$ ,  $R_2$ , and  $R_3$  are equal resistors having a value the same as the characteristic impedance of the line to be matched.  $R_4$  and  $R_5$  are identical and are of high value compared with the other three,  $R_4$  being used to isolate the d.c. meter circuit from the r.f. bridge, and  $R_5$  to balance the shunting effect of  $R_4$ . The 10,000-ohm variable resistor is for setting the meter sensitivity to conform to the power taken from the transmitter. The instruction book states that power inputs between 10 and 100 watts will permit proper operation of the bridge.

An innovation in the bridge circuit is the use of a ballast lamp,  $RT$ , to maintain the r.f. voltage applied to the bridge at a reasonably-constant

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Inside view of the "Matchmaster."  
Six noninductive wire-wound resistors in parallel form the dummy antenna. The variable capacitors at the lower right are used in frequency-compensating circuits for the dummy antenna and wattmeter voltage-divider.

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value when different loads are connected to the output terminals. The ballast, a GE 15-watt 120-volt miniature-base lamp, would seem to be a worth-while addition to such a bridge when no other means is used for keeping the input voltage constant (the importance of this has been stressed many times in both *QST* and the *Handbook*, when reasonable accuracy is to be attained in s.w.r. measurement).

A three-position switch is used for the various functions. In one position the d.c. instrument, a 0-1 milliammeter, is connected to the line r.f. voltmeter for power measurement. In this position the s.w.r. bridge and output connector are disconnected. In the second switch position both the dummy load and s.w.r. bridge are connected to the input terminals and the milliammeter is switched to the bridge-indicator circuit, while the output terminals are still disconnected. This posi-

tion permits adjusting the meter reading to full scale for subsequent s.w.r. measurement. The third switch position adds a connection between the bridge and the output terminals, giving the s.w.r. reading. Since the dummy antenna is permanently connected in all three switch positions and the s.w.r. bridge is of the low-power type, the "Matchmaster" cannot be left in the line after tests and adjustments have been made.

The dummy antenna is specified to have a standing-wave ratio of 1.2-to-1 or less at all frequencies up to 30 Mc., and the power meter will give useful readings at frequencies between 500 kc. and 30 Mc. — *G.G.*

## A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4½ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W0, K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.  
VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.  
VE2 — Harry J. Mahson, VE2APH, 122 Regent Ave., Beaconsfield West, Que.  
Leslie A. Whetham, VE3QE, 52 Sylvia Crescent, Hamilton, Ont.  
VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.  
VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.  
VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.  
VE7 — H. R. Hough, VE7HR, 2316 Trent St., Victoria, B. C.  
VES — W. L. Geary, VESAW, Box 534, Whitehorse, Y. T.  
VO — Ernest Ash, VO1A, P. O. Box 8, St. John's, Newfoundland.  
KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.  
KH6 — Andy H. Fuchikami, KH6BA, 2543 Namaau Dr., Honolulu, T. H.  
KL7 — Box 73, Douglas, Alaska.  
KZ5 — Gilbert C. Foster, KZ5GF, Box 407, Balboa, C. Z.

W1, K1 — J. R. Baker, jr., W1JOJ, Box 232, Ipswich, Mass.  
W2, K2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.  
W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.  
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.  
W5, K5 — Oren B. Gambill, W5WI, 2514 N. Garrison, Tulsa 6, Okla.  
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.  
W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.  
W8, K8 — Walter E. Musgrave, W8NGW, 1294 E. 188th St., Cleveland 10, Ohio.  
W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wisc.

### ARE YOU LICENSED?

• When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and or the class of operator license held, that we may verify your classification.

# What About the Low-Frequency Harmonics?

*A Serious Problem for the Amateur Newcomer*

BY CHARLES L. WOOD,\* W2VMX

• Although most hams these days worry about TVI from their v.h.f. harmonics, W2VMX points out that even more serious trouble can be caused by the low-order (second, third, etc.) harmonics that may interfere in channels used by important communications services. This should be of special significance to the Novice working on the 80- and 40-meter bands, since the second harmonics fall outside the bands assigned to amateurs.

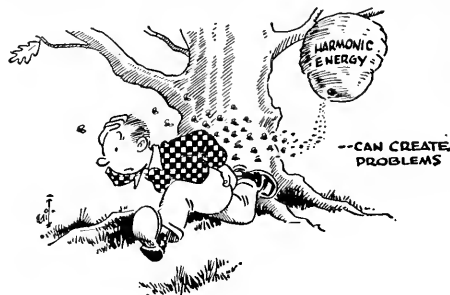
THE problem of harmonics in amateur radio is by no means limited to the matter of TVI. The v.h.f. harmonics which so irk the XYL and the neighbors have simply received more attention in recent years. Yet there are many hams on the air today radiating strong signals, outside amateur bands, that do *not* bother TV sets. Too often, the first inkling of trouble in these cases is a letter from the FCC. ARRL Official Observers are sending many post cards to amateurs in this category. It is sincerely hoped that this service will save many hams from FCC notices. Our station alone has sent cards to several *hundred* different amateurs heard outside amateur bands in the last few years.



If you would have first-hand knowledge of the situation, sweep the spectrum from 7350 to 7500 kc. on any Sunday afternoon. We have heard harmonics so thick in this region that some stations couldn't be copied because of harmonic QRN from others.

Granted that a problem exists, what are we going to do about it? Let's begin by asking where this unwanted energy comes from. A *harmonic* frequency is simply an integral multiple of some given frequency called the *fundamental*. For instance, if your transmitter operates on 3705

kc., the second harmonic is at 7410 kc., and the third is at  $3 \times 3705$  or 11,115 kc. Regardless of the kind of transmitter you use, whether homemade or store-bought, small amounts of energy at these harmonic frequencies are present in your final tank along with the useful energy at the fundamental frequency. Such energy can create problems whenever (1) there is a large amount of harmonic energy generated or (2)



when conditions exist under which the harmonic energy may be easily radiated. Either condition alone may be bad; the combination is an invitation for FCC action.

The files of our station contain quite a number of letters and comments from the stations to whom we have sent ARRL Official Observer cards. These letters show that the chief reasons for the harmonics we have heard are, in order, carelessness, ignorance of the situation, and the inability to correct the problem. Let's go through the most common mistakes and see whether we can avoid these pitfalls.

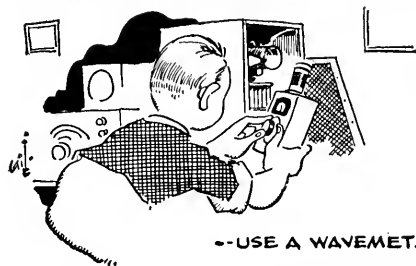
## *Use a Wavemeter*

The first question in chasing low-frequency harmonics should be this: To what band is the final tank circuit tuned? Many Novices are building bandswitching rigs. Many others have built rigs in which the final tank capacitor, without any change in the tank inductor, will tune, for instance, to both 3.7 and 7.4 Mc. In the case of the bandswitching transmitter, the danger always exists that the operator will, without thinking, leave a 3.7-Mc. crystal in place when the bandswitch is turned to the 7-Mc. band. A frequency-doubling action takes place and the full output of the transmitter is then radiated on a frequency outside the amateur bands. In the case of the transmitter which will tune both bands without replacing the inductor, the operator must at all times *beware* of the resonance point which uses the *lesser* capacitance

\* 609 Park Ave., Collingswood 7, N. J.

of the tuning capacitor. A special case of this same trouble may exist where the transmitter is operated from a crystal or VFO in the 160-meter region. In such a transmitter it is sometimes possible to tune a multiplier stage to the third harmonic around 5.4 Mc., instead of the intended second harmonic near 3.7 Mc. Again, it sometimes happens that the output of a doubler stage tuned to 3.7 Mc. may contain sufficient energy at 5.4 Mc. to drive a final so that it will show a pronounced dip at resonance at 5.4 Mc.

What can be done to make sure the final is tuned to the right band? The FCC regulations provide that the frequency of the transmitter must be checked from time to time. Unfortunately, we can't rely on the receiver to tell us about harmonics. If we have a 3.7-Mc. transmitter right next to the receiver, we will probably hear a signal every 3.7 Mc. right up the dial. The instrument we need to be sure of the right band is called a wavemeter. An excellent unit that can be built for just a few cents was described in *QST* recently, complete with a cut-out dial.<sup>1</sup> A more elaborate and more sensitive instrument was described by another author



in the February issue of this year.<sup>2</sup> The latter can be used to indicate the presence of very small amounts of harmonic energy at 5.4 and 11 Mc.

### Tank-Circuit Q

If we find that the final tank is not tuned to the right band, the necessary correction is easy enough. If the tank is tuned to the right place but there is enough unwanted energy to give an indication on the wavemeter, this is another problem. Then we must find out whether the unwanted signal is coming from the final or from some previous stage. Always correct the trouble on the lowest power level.

High-Q tank circuits will minimize harmonics in lower-level stages. Harmonic generation in amplifier stages can be minimized by reducing drive to the lowest practical level. Consult

<sup>1</sup>Smith, "The Measuring-Cup Band-Spotter," *QST*, Sept., 1952.

<sup>2</sup>McCoy, "The Baking-Pan Wavemeter," *QST*, Feb., 1955.

<sup>3</sup>Also see McCoy, "A 5-Band Antenna Coupler," *QST*, April, 1955.

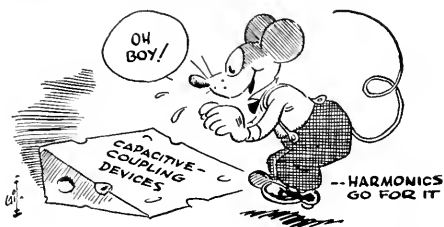
<sup>4</sup>Although the minimizing of the number of turns in the link coils is desirable in reducing harmonic output, it has been pointed out previously in *QST* that adequate output coupling sometimes requires a larger link winding than that supplied by coil manufacturers. This is particularly true when working into higher-impedance lines, such as 300-ohm Twin-Lead. — Ed.

the *Handbook* for proper grid drive, and do not exceed this figure. These are just two of the ways to help cut harmonic generation in the transmitter. After we have worked on this angle, we will probably want to ask if we can cut down the radiation of unwanted frequencies. The answer in most cases is yes.

### Antenna Coupler

Let's make up our mind that some sort of antenna-tuning device is always in order, not only to get the greatest efficiency from the radiator, but also to cut down spurious signals. Good designs are given in the *Handbook*,<sup>3</sup> and many excellent commercially-built units and kits are on the market. Where tuners provide for a grounding arrangement, this should always be the very best and most direct ground. One special precaution is in order, based on reports we have received. Don't overcouple the transmitter to the antenna or tuner! Beginners sometimes get the idea that the more turns there are in a link, the more r.f. will be coupled to the antenna. As a result, we have heard of links of ten and twenty and even thirty turns. Remember that such an arrangement is not only a link but a very effective capacitive-coupling device—something harmonics love like mice love cheese. Any two pieces of metal separated by an insulator form a capacitor of sorts, whether these be flat plates (as in an air variable) or rolled foil (as in a paper capacitor) or in coil form. Notice commercially-made coils for the 40- and 80-meter amateur bands. Usually these have only two turns, or three at the most.<sup>4</sup>

Measures which you have probably already taken in connection with TVI will also help with your low-frequency harmonics. For example: A Faraday shield in the final tank link, coax from this link to the shielded antenna tuner, and a shielded link in the tuner unit itself, grounding



of center taps of coils in balanced systems, and the like, are all beneficial. A low-pass filter will not have any effect whatever on low-frequency harmonics, since it is usually designed to pass everything below 30 Mc.

There are always a few special cases, and it may be that your rig seems to radiate unwanted signals despite everything that you have done to it. This is a good place for a huddle at the local club, as two heads are usually better than one at this point. If it is a manufactured item, write telling the maker exactly what happens, and follow his suggestions carefully. If your

(Continued on page 126)

# The Buffalo Area RACES Organization

*Getting Organized for Civil Defense Service in Erie County, N. Y.*

BY C. E. JOHNSON, JR.,\* W2PPY

• In past QSTs we have given you much information and advice on how to get set up for RACES. This article will tell you about Erie County's working organization, how it got that way and why.

ERIE COUNTY, New York, is the 13th largest county in the United States and has an area of 1042 square miles. There are three cities within its boundaries, namely, Buffalo, Lackawanna and Tonawanda with a total population of approximately 1,000,000 people.

The task of establishing suitable RACES networks within a county of this size was a formidable one. The local civil defense director required communications via amateur radio from one end of the county to the other. The terrain in the county ranges from flat to extremely hilly and the problems of reliable communications were many and varied.

Our first task was to decide how and on what frequencies the required networks would be established. A quick check of the RACES frequencies available to Erie County showed we had 10-, 6- and 2-meter frequencies available. After much discussion it was decided to build our networks around 6 and 2 meters, although there were many 10-meter mobile units available. Ten meters had been found undependable for short-range communications. In the civil defense test of 1953 this band opened up and stations from all parts of the county were calling our main control station causing confusion and chaos.

Erie County has two control centers, four zone headquarters, six aid check points and fifteen township report centers. The main control center

\* Radio Officer, Erie County Civil Defense, Room 218, City Hall, Buffalo, N. Y.

is located in the town hall in Lancaster, N. Y. This station, and its alternate, are able to operate on any RACES frequency assigned to Erie County by state civil defense. Three six-meter nets are controlled by 17-watt transmitters feeding ground-plane antennas: the Zone Headquarters Net on 53.6 Mc.; the Aid Check Point Net, 50.6 Mc.; and the Support Area Net on 53.74 Mc. This small amount of power seems ample for the distance to be covered. All other nets are controlled by 100-watt crystal-controlled transmitters feeding ground-plane antennas on 2 meters. One transmitter handles mobile control for the NE and SW Zone Headquarters on 145.200 and 145.320 Mc. respectively. A similar transmitter is used to control the mobile units for the NW and SE Zone Headquarters operating on 147.000 and 147.120 Mc. respectively.

The Township Net operates on a frequency of 145.440 Mc. and the State Command Net, which is the main link between the target city and the N. Y. State C.D. Headquarters in New York City operates on a frequency of 145.680 Mc. Any traffic for State is relayed via this net to a high-powered station called Area Ten Control Station, on 3509.5 or 3993 kc. located outside of the target area. There are two spare transmitters available at each Control Center.

The main target city, Buffalo, is divided into four zones. These zones are actually fully equipped control points with each service represented. Each of our zone Headquarters has a RACES installation capable of controlling any of nine mobile units assigned to it, or of contacting the Control Center should the need arise. The mobile control transmitter is 100 watts and the unit for contacting Control Center is 17 watts, both using ground-plane antennas. On 2 and 6 meters respectively the mobile units are small, compact

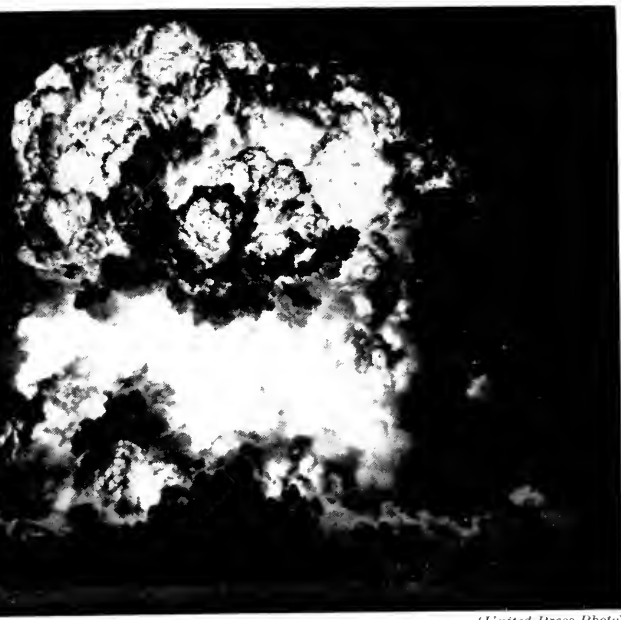
*(Continued on page 120)*

*(Left):* The EC and Radio Officer does his operating chore along with the rest of them. Here W2PPY operates one of the transmitters in the Erie County Control Center. *(Right):* The Zone Control Centers are busy places in any drill or test, as they will be if the real thing comes. This is Northeast Zone Control, with (l. to r.) operators Larry Thomas (non-amateur), K2GJP, K2HJB and K2GUC. Looking over their shoulders is K2DVD, Chief of Zone Communications.





# A. R. R. L. at OPERATION CUE



(United Press Photo)

## *The ARRL National Emergency Coördinator's Report of the League's Participation in FCDA's Yucca Flat Atomic Test Observer Program*

BY GEORGE HART, WINJMJ

"The shot is on!"

None of us really believed it. There had been too many such announcements during the previous nine days to have this one stir up any excitement. All it meant to most of us (that is, those of us who were still waiting) was another wearying bus ride to the AEC's Nevada Test Site, 90 miles away, probably to be followed by another last-minute postponement. By this time, we were hardened to such disappointment. Already we had journeyed to Yucca Flat three times, stood around in the freezing cold (and once in the freezing rain), went completely without sleep, except what we could snatch during the bus ride, only to be returned to Las Vegas without having seen anything except a lot of dry desert.

It was Wednesday evening, May 4th. To most of us observers, the weather looked favorable. There was very little breeze and visibility was good. A scattering of high cirrus clouds was expected to dissipate before morning. Once before, just a week ago, the weather had looked exactly like this, so we weren't too optimistic. Nevertheless, at 0400, the announcement was made that the shot was "on." Our long days of waiting seemed about to pay off. We kept our fingers crossed.

The time from then on flew rapidly. At 0430 daylight started to appear in the east, but it was still quite dark to the north, in the direction of the shot tower. At 0500, observers and media (press, radio, TV, etc.) personnel started shifting

around to find better vantage points to watch the shot. At 0510 minus thirty seconds we adjusted our high-intensity dark glasses (through which ordinary sunlight is scarcely visible) and listened to the countdown over the public-address system.

### *The "Shot"*

At exactly "zero" there came a blinding white flash (bright yellow through our glasses) and a sudden wave of heat. After three seconds we cautiously removed our glasses and watched the fireball form into its typical mushroom and fade through the color spectrum, from yellow to orange to red and finally to purple. Within fifteen seconds all that was left was a gigantic black mushroom with a whitening cap (ice crystals). This cap gradually detached itself from the rest of the mushroom and, rising gradually, it turned brown. Just beneath it a scraggly black cloud was forming, and at the base a cottony gray cloud of dust was spreading rapidly. The brown cloud, highly radioactive particles remaining from the shot tower, rose rapidly and approached the observer area. When it reached 40,000 feet, however, it was

• At the invitation of FCDA, the League sent its NEC to take part in Operation Cue. Some of his observations, including participation by amateurs, are presented herewith.



caught in a "shear" wind and dispersed. At the end of an hour, it was no longer visible. The black cloud, also radioactive but less so, rose more slowly and was eventually also dispersed. The gray cloud of dust spread laterally until it covered an area many miles in diameter, eventually permeating our observer area; the radioactivity in this dust cloud was said to be negligible.

The shock wave, arriving completely unannounced about forty seconds after zero, took most of us by surprise. It was a very sharp and sudden "blam!" rather than the deep rumbling we had expected. At our distance it was not strong enough to knock anybody over, but it startled many observers and stirred up a considerable amount of dust.

#### *Mass Feeding*

Now the mass feeding teams, which had been feeding us coffee and doughnuts all night, swung into action to feed us breakfast. These people, coming from all over the United States, were part of the Civil Defense Field Exercise group which was stationed at Mercury, Nevada. They also fed us a good substantial lunch on the following day on shot-plus-one tour of the forward area.

#### *Hams in Forward Area*

The group of volunteers who were stationed in the forward area 10,500 feet from ground zero joined us for breakfast. There were two amateurs among them (out of sixteen people) — W2TH, from Newark, N. Y., and W6LYF, from San Diego, Calif. They both appeared somewhat shaken up, but otherwise little the worse for their experience. Howard, W2TH, was left without appetite for breakfast, so we dined on one of the observer benches with W6LYF and had a very pleasant chat. Since then, we have asked both of them for a brief paragraph describing their experiences in the forward trench. Each supplied us with more than that, so we had to condense them to the following:

**W2TH:** "The most blinding light I ever saw, equal to 100 suns, was projected into the bottom of the trench. . . . I became conscious of the trench shaking from side to side. . . . Dirt fell in from the sides. . . . A terrific BANG split the air, seeming to come from everywhere overhead. . . . All sorts of debris was flying over our trench. . . . Then the command 'Out of the trench!' . . . Two of the Jeeps had their lights turned on

Part of the California Communications Caravan. Eight amateurs were in the crew of 25 who manned these units. The buses, completely equipped with spotlights, floodlights, p.a. system and multitudinous transmitting equipment (note the whips), were used for control purposes. Radio cars were assigned to c.d. service chiefs. All these units operated with the C.D. Field Exercises and were stationed at Mercury, Nevada.

by the blast. . . . As the base of the atomic cloud approached menacingly, we loaded into our Jeeps and got out of there." W2TH is RACES Radio Officer for Wayne County, N. Y. He carried a Gonset transmitter into the trench with him.

**W6LYF:** "'Shot' time found us kneeling in trench with fiber glass helmets, goggles and respirators in place, hands covering our eyes and hold-



W2TH and W6LYF, very much as they looked after emerging from the trench at 10,500 ft. from the shot tower. They were among 16 volunteers at that point.

ing our breath. Could see the light from shot through covering. Earth started to rumble (like an earthquake) and then came shock wave. Rocks and dirt fell into trench, then came the noise of the blast, loud and sharp. At shot plus fifteen seconds, we were standing in trench looking at the enormous cloud, brown with pink tints, rising before us. At shot plus five minutes we were in Jeeps headed for Media Hill six miles away and breakfast." W6LYF is Radio Chief for California Region 10 (San Diego and Imperial Counties). At Operation Cue, he was a member of the California communications team which provided communications for FCDA-sponsored field exercises before and after the shot.

### Post-Shot Briefings

The day following the shot we made our last (sixth) trip to Yucca Flat, for most of us completing a total of over 1000 miles of travel in the buses provided. The purpose of this trip was to observe the destruction of "Doom Town" by the atomic blast. From a communications standpoint, let it be said that radio equipment stands up well under an atomic blast, provided it is not much closer than a mile from ground zero. Even then, if properly protected by shelters, it has a good chance of remaining in operating condition. A 250-watt broadcast transmitter installed in one of the steel-reinforced concrete block houses at the 4700-foot line was in actual operation on the Conelrad frequency of 1240 kc., using the call KO2XBM. This rig, sponsored by RETMA, was in operation until five minutes before the blast. After the blast it did not return to the air immediately, but the trouble was found to have been power failure; the equipment remained in operating condition and returned to the air shortly after the blast.

Other radio communications equipment in this and similar houses was found to be undamaged and still in working condition. Of the two towers closest to the blast, the guyed standard broadcast tower remained standing, although very slightly bowed. The unguyed 120-ft. tower had been broken off in the middle.

"Doom Town" had become "Survival City," but not everybody survived. "People" (mannequins, of course) in the open didn't have a chance, what with the combined effects of heat, radiation and blast, each lethal by itself. Those in the above-ground parts of the various houses were killed either by blast or missiles. Only those in basement shelters survived, although many were injured. Naturally, the closer to ground zero the greater the destruction. Normally-constructed houses 4700 ft. from ground zero were reduced to rubble, but the specially built concrete-and-steel block houses stood up well.

### Amateurs in Field Exercises

There were a few amateurs in the observer and media groups, but most of them were amateurs incidental to some other capacity. The real communicating was done by the Field Exercise group stationed at Mercury, just a few miles from the shot area. This included amateurs belonging to the California communications team, which came

in convoy from Sacramento starting on April 17th, traveling via Los Angeles and picking up members along the way. Personnel in the convoy numbered about 25, including the following amateurs: W6s JN ASI RLB CIS LY CV OU and WYT. Equipment consisted of two completely-equipped communications buses and several cars (see cut) operating in the Disaster Communications Service (1761.5 kc.) and 47 Mc. During the period of the actual exercise, no amateur frequencies were used. One bus was stationed at the Observer Area on Media Hill, the other at field crew headquarters located approximately a mile forward.

The communications gang worked hard. The Field Exercises were no picnic. Troubles developed with the equipment (as they always do) necessitating long hours of trouble shooting. Some special communications arrangements had also to be set up, necessitating some equipment changes. Most of this work was done out in the open which, in the desert at that time of year, means a scorching sun and swirling dust during the day, penetrating cold dropping far below freezing at night.

W6CIS (ex ARRL Director, Pacific Division) received special permission from the AEC to use his call from one of the buses to keep in contact with home offices in California. He fired up one of the rigs using 813s running 250 watts to an 18-foot base-loaded whip mounted atop the bus. Power was supplied by a 3.5-kw. generator which is standard equipment on the buses. Much traffic was handled, with the assistance of many California amateurs, on the California Civil Defense Net frequency of 3501 kc. and other frequencies. This circuit came in mighty handy for getting word back home in lieu of the greatly-overtaxed telephone facilities through Las Vegas. In addition to personal traffic, much civil defense official traffic was also handled. W6CIS lists and wishes to thank the following stations for having assisted in keeping this traffic moving: W6s SWP BP SDR CLV EAR HOR ATO JGJ CJP IZG KB WR JDG CGQ JKW PQW IRJ KMJ, K6s JOQ DM HYT CB and K7FNS. W6JN did much of the operating from W6CIS/7.

\* \* \*

We wish it were possible here to impart more fully to all readers the information picked up

(Continued on page 122)

A snapshot of the "shot" tower (background) from 4700 ft. away. Other installations in view are test installations. The 500-ft. tower was unguyed, 20' square at the base, equipped with elevator, cost about \$250,000. Nothing, but nothing, was left of it after the blast.

August 1955



# QST—Volume IV

## Part II† — 1954 Supplement to the Foreword to the Index to Volume IV of QST

ONE of the puzzles which I have been unable to solve, from the data appearing in Volumes III, IV, and V of *QST*, is this: how many "tube" transmitters were actually in operation at amateur stations in the U. S. A. as of approximately July 1, 1921?

It finally occurred to me that it might be interesting to examine the published lists of "Calls Heard," from January, 1920 (when the first express reference to a "tube" set appeared in that department of the magazine), up to and including August, 1921, when the lists of stations heard during June, 1921, were published. Accordingly, I have done this; and I have separated from those lists the stations which various reporters identified as using c.w., i.e.w., buzzer-modulated telegraphy, and 'phone. To give the reader some sort of an idea of when each "tube" station first got into operation, I have also listed the issue and page of *QST* where its call was first published in "Calls Heard"; and I have identified the reporting station.<sup>1</sup>

No attempt was made to follow possible changes from i.e.w. to c.w., or from c.w. to 'phone. I have simply listed the description of the type (or types) of transmission, as first reported in *QST*.

*Unlike low-powered spark transmitters, v.t. rigs were potent distance-getters. Therefore, I believe that almost all of them were rather promptly reported in "Calls Heard."* A possible exception would be the low-powered 'phone stations which would have little range; but I doubt if many such stations were in existence during the period studied.

The geographical distribution of these "tube" sets, as between the nine districts, is indicated by the list — to some extent, at least.

The totals are as follows:

Unlicensed.....	2
First District.....	93
Second District.....	158
Third District.....	45
Fourth District.....	11
Fifth District.....	9
Sixth District.....	28
Seventh District.....	7
Eighth District.....	126
Ninth District.....	52
Total.....	531

In addition, 5 Canadian v.t. stations were listed in "Calls Heard"; and 23 short-wave Army, Navy, commercial, or government v.t. stations appeared there.

As will be seen by the second table, following the compilation of data from "Calls Heard," there were some *additional* v.t. stations *not* appearing in the published lists of "Calls Heard" which were referred to in the pages of *QST*, between January, 1920, and August, 1921. (January, 1920, is in Volume III; August, 1921, is in Volume V.) The "score" on these is as follows:

Unlicensed.....	1
First District.....	12
Second District.....	4
Third District.....	7
Fourth District.....	1
Fifth District.....	3
Sixth District.....	1
Seventh District.....	3
Eighth District.....	6
Ninth District.....	8
Total additional stations.....	46
(Including 2 not referred to by Call-Letters)	

In Canada, 3 additional v.t. stations are shown (including one which is referred to by the name of its owner and not by call letters).

These two lists (and the appended tables, which give details) demonstrate that at least 577 amateur v.t. transmitters had "come onto the air" in the U. S. A. by July 1, 1921. The question remains: how many *more* amateur v.t. installations were in the United States as of that same date?

I can only make a *guess* on this; and my best guess is: not over another 400 — making a total for the United States, as of July 1, 1921, of 977 amateur v.t. stations.

As of June 30, 1921, the total number of *all* amateur stations licensed by the Department of Commerce had reached 10,809. See page 68 of *Two Hundred Meters and Down*, by the late Clinton B. De Soto, where it is said:

... The Department of Commerce reported 10,809 licensed amateur stations at the end of the fiscal year on June 30, 1921, an increase of 90 per cent. ...

If my guesses as to the numbers of licensed stations using "tube" transmitters, as of the two dates (July 1, 1920,<sup>2</sup> and July 1, 1921), are compared, it will be seen that the indicated increase, in the number of v.t. sets, 777 additional v.t. sets, is 388.5%.

I think that's "about right."

† For previous installments see following *QST* references; Part I of "*QST* — Volume IV," July, 1955; "*QST* — Volume I," October, 1954; "*QST* — Volume II," February, 1955; Part I of "*QST* — Volume III," March, 1955; Part II of "*QST* — Volume III," April, 1955; Part III of "*QST* — Volume III," June, 1955.

<sup>1</sup> For absolute accuracy, it probably would be necessary

to check and re-check each list of "Calls Heard," and to transfer the items of information to punched cards; and to run the latter through an IBM tabulator. This I have not done; but I have tried very hard to avoid errors.

<sup>2</sup> It was "not over 200 stations," as of July 1, 1920. See "Foreword to the Index to Volume III," *QST* for March, 1955, page 51.

On the same premise, one amateur station in 28.59 had a "tube" transmitter as of July 1, 1920; and one amateur station in 11.06 had one, as of July 1, 1921.

Again, I think those figures are "about right."

Remember, please, that on the above subject I cannot offer proof. All I can do is to hazard an intelligent guess based on my recollection of actual operating conditions and on the data above set forth.

On another subject mentioned in my "Foreword to the Index to Volume IV of *QST*," I would also like to add a few words:

As to the short waves (meaning those below 200 meters) there is some later evidence showing that amateurs, in general, lacked proper receiving apparatus for picking them up; and which shows that this condition of affairs lasted for a considerable period of time. For instance:

In the May (1924) issue of *QST* (Volume VII), at page 10, Dr. A. Hoyt Taylor, Physicist, U.S.N., in his article called "The Navy's Work on Short Waves," stated as follows:

... Our interest in short waves is by no means a new one. Since 1917 one of the standard waves on board every battleship has been 150 meters. From a modern point of view the apparatus is pretty crude, being a peculiar type of spark set which is now of no particular interest; nevertheless occasionally extraordinary long distances were reached with it.

*Had amateurs in the last few years had receivers capable of tuning down below 200 meters, we would doubtless have had a great many reports on our transmissions on 150 meters by these ships. Plans are now under way to replace this old equipment with modern tube sets of our own design.* . . . [Italics added by S.B.Y.]

In Volume VI of *QST* I have also run across some additional material on early amateur work with small "tube" transmitters which was done for the purpose of QRM avoidance; and I would like to refer to it now:

At 12, March 1923, S. Kruse (Technical Editor of *QST*), in an article entitled "Exploring 100 Meters," described some preliminary experiments on waves about 170 meters long, as follows:

"... In the winter of 1920-21, mainly to get away from NSF's chopper and NAA's arc mush, we at Washington, D. C., began to feel our way downward. To our pleased surprise we found that our regular sets would work easily below 170 meters if anyone could be induced to get down and listen for them. A low-powered tube set in Washington and a

small spark-tube set in Hyattsville, Md., were able to work beautifully without any interference at all from NSF, NAA or *anything* else on *any* wavelength, although 3RP at Hyattsville was using only a Western Electric 'E' tube driven by a Ford spark coil. His signals at Washington (8 miles) were so intense that the phones were normally left on the table. The other station, 3ABI, was able to work ITS and IQP whenever they could be induced to tune down — again there was *no interference*. . . .

To those readers who are interested to know what type of amateur short-wave work next followed the first "dips" below 200 meters (which were motivated by a desire to avoid interference), I strongly recommend close study of the balance of this same article by Mr. Kruse. It recites: the January (1922) tests of Mr. Boyd Phelps, at Minneapolis, Minnesota, on 100 meters; Phelps's later tests, in the spring of 1922 (after he had moved to Hartford, Connecticut, and had joined *QST*'s staff); the January (1923) tests between 9ZN and 1HX, 3XM, IQP, 3ALN, 3JJ, 3APV, and the listening-station of Mr. A. L. Budlong (at Washington, D. C.); and also the February, 1923, tests between 3ALN, IQP, and 9ZN.

Out of these experiments<sup>3</sup> an interesting fact emerged. On page 12, of the March, 1923, *QST*, Mr. Kruse stated it in these words:

... Why all these logs? For this reason — *in every single test, with one solitary exception, the best signals were heard at some wave length below 170 meters.* Even if we forget all about the decreased interference it is possible for us to move downward, work our antennas near their fundamentals (or below) and get better signals thru.

The early settlers have found the region of 100 meters good; they invite the amateur world as a whole to come along. . . .

As a first step toward stimulating general amateur interest in the wavelengths around 100 meters, the League's Traffic Manager, F. H. Schnell, announced "A 100-Meter CQ-Party," for the nights of March 24th and 25th, 1923. (See Volume VI, at 12 to 13, March 1923.) In addition, the following announcement was made by that official (see 13, March 1923, in Volume VI):

"... We are planning a system of short-wave test stations which will, at the same day and hour of each week, start at 200 meters and send tests down to 100 meters or lower. The schedule is not ready but will be broadcast on 200 meters on March 3rd and 10th by picked ARRL stations in each district,

(Continued on page 124)

<sup>3</sup> Mr. K. B. Warner interjected a somewhat critical note, re some of the experiments conducted by amateurs on waves between 80 and 135 meters, during the winter of 1922-1923. On this see his editorial, "A New Field," at 29 to 30, March 1923 (Volume VI). Here he said:

... Last winter considerable work on waves between 80 and 135 meters was done between some amateur stations in Boston, Hartford, and Pittsburgh, but the data seems to have become commercially interesting and the fellows in possession of it have shut up like clams and there is slight hope that those particular results will ever become available to us. As a result some of our own gang have determined to dig up the dope for themselves and the preliminary tests have been most encouraging. . . . [Italics added by S.B.Y.]

In the next paragraph of the same Editorial, Mr. Warner pointed out the freedom from interference which users of 100-meter waves were enjoying, and then referred to the added "bonus" of appreciable increase in radiation efficiency which had been experienced when the wavelength was shortened:

... Do you know that 100-meter transmission between Illinois and Connecticut is proving F.B.? It is! At the present time there is of course practically no QRM on such wave lengths except an occasional harmonic. That alone makes it worth while. There seems to be an appreciable increase in the efficiency of radiation as the wave length is dropped; and there is the 'kick' the experimenter gets in trying something new — and succeeding. . . . [Italics added by S.B.Y.]

# Happenings of the Month

## ELECTION NOTICE

**To All Full Members of the American Radio Relay League Residing in the Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern Divisions.**

An election is about to be held in each of the above-mentioned divisions to choose both a director and a vice-director for the 1956-1957 term. These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. The election procedures are specified in the By-Laws. A copy of the Articles of Association and By-Laws will be mailed to any member upon request.

Nomination is by petition, which must reach the Headquarters by noon of September 20th. Nominating petitions are hereby solicited. Ten or more Full Members of the League residing in any one of the above-named divisions may join in nominating any eligible Full Member residing in that division as a candidate for director therefrom, or as a candidate for vice-director therefrom. No person may simultaneously be a candidate for both offices; if petitions are received naming the same candidate for both offices, his nomination will be deemed for director only and his nomination for vice-director will be void. Inasmuch as all the powers of the director are transferred to the vice-director in the event of the director's resignation or death or inability to

perform his duties, it is of as great importance to name a candidate for vice-director as it is for director. The following form for nomination is suggested:

### *Executive Committee*

*The American Radio Relay League  
West Hartford 7, Conn.*

*We, the undersigned Full Members of the ARRL residing in the ..... Division, hereby nominate ..... of ..... as a candidate for director; and we also nominate ..... of ..... as a candidate for vice-director; from this division for the 1956-1957 term.*

*(Signatures and addresses)*

The signers must be Full Members in good standing. The nominee must be a Full Member and the holder of an amateur license, and must have been a member of the League for a continuous term of at least four years at the time of his election. No person is eligible who is commercially engaged in the manufacture, sale or rental of radio apparatus capable of being used in radio communications, or is commercially engaged in the publication of radio literature intended in whole or in part for consumption by radio amateurs.

All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon EDST of the 20th day of September, 1955. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of vice-director. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director

*(Continued on page 130)*



Gov. William G. Stratton is shown signing into law the bill authorizing issuance of special call-letter license plates to amateurs in Illinois. Witnessing the happy moment are Hon. Paul Zemple, House of Representatives; Rev. Anthony T. Tamulis, W9PQS; William P. Ingersoll, W9BHT; Ladd J. Smach, W9CYD; Tom G. Seese, W9LZ; Alex K. Scherer, W9EU; and Hon. Albert Scott, State Senator.



Gov. George W. Leader wields the pen in Pennsylvania. Participating in the ceremonies were Gilbert L. Crossley, W3YA, Atlantic Division Director; Rep. Albert S. Readinger; James F. Cochran, W3MLY; William T. Burton, Jr., W3ADF; Rep. Charles C. Smith; and James F. Marx, W3BN. W3RSB served as chairman of the committee but was in the hospital when the bill was signed.



# Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

## KA STATIONS

APO 343  
San Francisco, Calif.

Editor, *QST*:

It has recently occurred to me that much misinformation exists regarding operation of amateur radio stations in the Far East. I am therefore taking the liberty of writing this letter in an effort to outline the operation of amateur radio stations by members of the United States Forces stationed in the Far East Command.

As you undoubtedly know, immediately subsequent to cessation of hostilities in this theater, operation of amateur radio stations in Japan and other portions of the theater was authorized by the Supreme Commander. These stations operated with the call sign prefix normally used by citizens of Japan (JA). When sovereign rights were restored to the Government of Japan, however, it was necessary that definite agreements between the United States and Japan be executed. The specific agreement which permits operation in the amateur bands in Japan is outlined in the Telecommunications-Electronics Agreement supplementing the Administrative Agreement under Article III of the Security Treaty between the United States and Japan.

It was agreed that the terms "amateur," "license," and "licensee" would not be used in describing privately owned stations operating in the amateur bands in Japan. These stations were known, instead, as Auxiliary Military Radio Stations (AMRS), and such stations were to operate with the call sign prefix "KA" rather than the "JA" previously authorized.

Operation of the amateur radio stations was to be regulated by such regulations and directives issued by the Commander in Chief, Far East, or his successor, as were required for orderly operation. One of the stipulations in this agreement was that Far East Command regulations would be in consonance with the Japanese rules and regulations governing their own amateur service. Specifically, the difference between the Japanese laws and those laws which govern operation of amateur radio stations in the United States were not very great. Up until recently, amateur radio stations operating in Japan operated under rules and regulations very similar to those of the Federal Communications Commission. Approximately eleven months ago, however, the Japanese Government pointed out that Japanese National amateurs are prohibited from handling third-party traffic; and since the United States had agreed to issue such rules and regulations as would be in consonance with the Japanese laws, the Japanese Government requested the Commander in Chief, Far East, to issue the necessary directive prohibiting the handling of third-party traffic by United States Forces personnel operating in Japan. Also, since Japanese law states that only the licensed operator of a station may operate the station, the United States was requested to prohibit the privilege of a non-licensed individual speaking over the microphone of an AMRS station.

Discussion and study of this proposal took some eleven months to complete. It was finally agreed, however, that the Japanese request was valid, inasmuch as the agreement specified above clearly stipulated that operation of United States Forces AMRS stations would be in consonance with operation of Japanese National amateur stations. It was therefore agreed that the United States would issue such directives as would be required to prohibit the handling of third party traffic by AMRS stations located in Japan. Since the agreement specified above did not include any territory outside of the Japan limits, operation of amateur stations in Okinawa was unaffected.

I have no doubt that some word of the third-party traffic prohibition has reached you, and I expect that some of the information you may have received has been garbled. I hope that I have been able to outline the present conditions under

which members of the United States Army Forces are able to enjoy their amateur privileges in this country, and hope that you may be able to afford some publicity to the capabilities and limitations of amateur operation in the Far East by such notices in *QST* as you deem appropriate. If I may be of any further assistance in providing you with other details, please advise me as soon as possible, and I will sincerely attempt to do so.

— Major August J. Sabel  
Director of AMRS

## MORE ON RAPP

8314 So. Langley Ave.  
Chicago 19, Ill.

Editor, *QST*:

Thanks to W6TKA (June *QST*). He has presented a viewpoint concerning the Larson E. Rapp, W10U, articles in which I concur. Be assured this is also the opinion of more of your readers than you may suspect.

Down with Rapp — there's already enough "April Fool" in the stuff I build!

— James A. Gundry, W9KNP

1311 N. Ode St.  
Arlington, Va.

Editor, *QST*:

All this fuss over the article in the April, 1955, issue of *QST* has me worried. If this man's article is not true, does this mean that his other articles were not true, also?

I'm only a beginner at radio now (6 months), and about 3 months ago I was given past issues of *QST*. Naturally I read them by the hours, trying to learn as much as I could. But it just occurred to me that the article "The Double-Spectrum Theorem" (*QST*, April, 1952) probably is not true. If it was, why aren't we using it? An article appears in every April issue of *QST*. Why print it? You just waste space and confuse people.

— Charles Long, K4BND

3127 N. 17 Drive  
Phoenix, Ariz.

Editor, *QST*:

The letters in June *QST* about your Rapp articles are enough to make one bury his head in his hands and cry like a baby. The human race *must* be more highly advanced than these indicate. Here's a vote for maintaining your work as before. Those articles were obviously hoaxes to me at the age of 14.

— Charles Fenwick, W7YMO

## NEW SYMBOLS

1208 Jarvis Ave.  
Chicago 26, Ill.

Editor, *QST*:

In case you are collecting opinions, I should like to add my vote of dissent to the new system of schematics. They impress me as being full of "hay" and hard to read, particularly the power socket and coaxial-cable designations.

— E. W. Williamson, W9ROE

Qtrs. I, Charleston Naval Shipyard  
Charleston, S. C.

Editor, *QST*:

Here is my complaint to add to the many thousands I'm sure you have already received.

I do not (repeat, NOT) like the new wiring diagrams. After forty years' experience with the others, I'm sure I never will like 'em.

— G. L. Countryman, W3HH/4  
Captain, USN

(Continued on page 136)



# YL NEWS and VIEWS

BY ELEANOR WILSON,\* W1QON

## New Term for the YLRL

The new officers of the Young Ladies Radio League assumed their duties July 1st and will serve an 18-month term in order to put the club on a calendar year starting January 1, 1957.

President of the YLRL for 1955 and '56 is Alice "Cris" Bowlin, W9LOY, of Chicago, Ill.; YLRL chairman for the ninth district last year. Cris is one of the founders and a past-president of the LARK of Chicago. With her OM, W9RQF, she operates on 40 and 75 'phone.

Last year's publicity chairman became the V.P. for the new term. Also a past-president of the LARK, Gloria Matuska, W9YBC, of North Riverside, Ill., served with W6LBO as co-chairman of publicity for the First YLRL International Convention. The XYL of W9ATW, she is on 20 and 40 c.w. and 'phone. See her photo in the YL department of *QST* for Sept., 1954.

Marie Ellis, W0MMT, the new YLRL Secy.-Treas., is SEC for Colorado and assistant to ARRL Director W0IC, representing YLs in the Rocky Mountain Division. On 75 meters primarily, Marie is also Secy.-Treas. of the Trout Route Mike & Key Club of Ft. Collins.

Peg Ferber, W3RXV, of Slatington, Penna., continues for a second term as editor of *YL Harmonics*. Realizing her aims of a year ago, she

\*YL Editor, *QST*. Please send all contributions to W1QON's home address: 318 Fisher St., Walpole, Mass.

The forty YLs who attended the 5th annual LARK Convention in Chicago May 20th thru 22nd voted to change the name of their annual meeting hereafter to Midwest YL Convention. Chairman Helen Boddy, W9BCA, announced that next year the affair will be held at St. Paul, Minnesota.

has effected a number of changes in the club paper. She works several bands with a Viking and is the XYL of W3RXW. See her photo in the YL department of *QST* for Sept., 1954.

The March, 1955, YL department carried a story and photograph of the new publicity chairman, Barbara Harrington, W1TRE, of Topsfield, Mass.

Because of a tie vote, ballots will be cast again for a chairman of the first district.

The other district chairmen follow:

**K2IWO** — Hilda Andrew; Newburgh, N. Y.; ex-W4HWR and D4AAB; licensed since 1941; XYL of W4EFG, Air Force chaplain.

**W3TSC** — Camille Hedges; Washington, D. C.; operates 40 c.w. daily; OM is W3BKE.

**W4BLR** — Katherine Anderson; Richmond, Va.; licensed less than two years ago, Kay already has several merit awards and contest certificates to her credit. Her photo appeared in "Results of the Novice Round-up — 1954," *QST* for June, 1954.

**W5SYL** — Iva Haley; Grand Prairie, Texas. XYL of W5MTQ; NCS of the K.L.R. Net for the past two years.

**W6FEA** — Gertrude Cassidy; Fresno; about to move to San Francisco; served as YLRL sixth district chairman in 1951 and '52; is V.P. of American Legion Amateur Radio Net; OM is W6WJF.

**W7** — The chairman for the seventh district will be appointed by the president.

**W8LGY** — Ruth Rickett; Columbus, Ohio; on 3960 kc. daily; OM W8BTW.

**W9AQB** — Norma Courtney; Mishawaka, Ind.; had top score for her district in the last YLRL Anniversary Party; OM is W9AQA.

**W0KJZ** — Lydia Johnson; St. Paul, Minn.; operates "99 per cent c.w."; has Code Proficiency Certificate for 25 w.p.m.; busy on several traffic nets.

**VE** — The chairman for the VE districts will be appointed by the president.

**KZ5LM** — Lois Magner; Margarita, C. Z.

**KH6AFC** — Hazel Keefer; Honolulu.

As stated in the club constitution, the Young Ladies Radio League is an organization consisting solely of duly licensed women amateur radio operators. The aim of the YLRL is to further coöperation among members, to develop efficiency in radio operating, and to further the





W8LCY



W9LOY



W9AQB

interests of amateur radio in general. Organized in 1939 by Ethel Smith, W3MSU (then W7FWB), the current membership is close to six hundred. Any licensed woman amateur may join.

During the past term the club constitution and by-laws were revised for the second time (first revision in 1948). A second edition of the *YLRL Directory* was edited by Lenore Conn, W6NAZ, and the first YLRL International Convention was sponsored by the Los Angeles Young Ladies Radio Club.

The YLRL conducts two major contests annually — the YLRL Anniversary Party and the YL-OM Contest. It also conducts weekly nets on several bands. The net schedule for the new term will be published in this department.

*YL Harmonics*, a publication issued bi-monthly by the organization, gives the membership coverage of club activities and news.

There are three YLRL awards available to any licensed amateur — Worked All States-YL, YL Century Certificate, and Worked All Continents-YL.

### YLS You May Have Worked

**W1VXC** — One of but a very few YLs in R. I., June Burkett of Rumford is PAM for her state. Traffic handling is June's favorite kind of operating. Her OM is W1OGT.

**VE3DDA** — From Brantford, Ont., Eleanor Elliot puts

out a good signal on 80 meters in spite of running only 12 watts to a home-brew rig. The OM is VE3BZP.

**KN0AYQ** — Only 8 years old, Bonnie Pass of Ladue, Mo., is giving her twin 14-year-old brothers, W0s MSA and MSB, competition on 40 c.w.

**W9IMT** — Elzenia "Red" Stalcup of Bloomfield, Ind.; XYL of W9HSK. She operates on 75, 40 and 20. Red also holds a code proficiency certificate for 25 w.p.m.

**W9RUJ** — For 18 years Mary Meyer of Waukesha, Wisc., listened to the amateur frequencies before getting her own license in 1952. She uses a B&W 5100 on several bands.

**W1WJA** and **W1VVS** — Marjorie Bayer and Shirley Ailes are sisters living fifty miles apart in Vt. They deemed it less expensive to buy radio gear than to pay telephone bills. They are both readily available for Vt. contacts on 75.

**W6QMO** — Jeri Bey is president of the San Francisco YLRL unit. An OPS and BPL certificate holder, Jeri participates in a number of traffic nets.

**W0MPB** — Dot Breeden of Topeka, Kan., made some 1500 contacts in just a few months after obtaining her license in July, 1954. The XYL of W0LHX, she uses a home-built rig on several bands, 'phone and c.w.

**VE2NJ** — Nancy Jeary has been active since 1947. From her Greenfield Park, Que., QTH she can be found on 3785 kc. "at breakfast, lunch, and dinner time daily." Her OM is VE2OS.

### WAS-YL Award

1) The Worked All States-YL award is available to all amateurs.

2) Two-way communications must be established on the amateur bands with all 48 states. Any and all amateur bands

(Continued on page 130)



W1WJA



W1VVS



W1VXC



VE3DDA



KN0AYQ



W0MPB



W9IMT



W6QMO



W9RUJ



VE2NJ



# Hints and Kinks

## For the Experimenter



### PROTECTION FOR VOLT-OHM-MILLIAMMETERS

MANY of us who make frequent use of a general-purpose test meter will, at one time or another, inadvertently apply voltage to the terminals of an instrument having the function or selector switch set at the *ohms* position. This act of negligence may result in a burnt-out multiplier shunt, a new configuration for the pointer or even more serious damage to the meter movement.

The installation of a fuse as a preventive measure against this mistreatment of a meter is not always desirable or completely effective. The resistance of low-current fuses may not be too uniform and, in some cases, the resistance—whatever it happens to be—is great enough to affect the calibration of the *ohms* ranges of the instrument.

A more positive protection for a meter may be obtained by connecting a No. 14 flashlight lamp in series with the internal shunts. It has been determined that the resistance of these 2.5-volt 0.3-amp. bulbs checks consistently at very close to one ohm. Therefore, once the meter circuit has been modified to include a bulb, it is possible to make replacements in event of failure without concern over variations in calibration.

Fig. 1 shows how a No. 14 bulb has been connected into a typical general-purpose test meter.

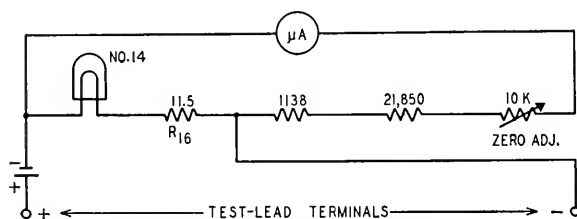


Fig. 1—Protective arrangement for volt-ohm-milliammeters suggested by W9AFT.

The circuit and constants shown are for the popular Simpson type 260 meter. The 1-ohm resistance of the bulb is compensated for by removing approximately 2 inches of resistance wire from the 11.5-ohm shunt ( $R_{16}$  of the Simpson circuit). Usually, it is possible to find mounting space within the meter case for a socket for the bulb. This method of installation simplifies the changing of a burnt-out lamp.

Any voltage applied to the *ohms* terminals that is lower than the *burn-out* rating of the bulb will not cause damage to the meter shunts. At higher values of voltage, the bulb will burn

out even before the pointer can deflect to full scale. It should be pointed out that *all* resistance ranges of a circuit of the type shown are protected by this simple installation.

—Harlon Wright, W9AFT

### IMPROVED BLEEDER CIRCUIT

THE arrangement shown in Fig. 2 provides a warning *before* the bleeder resistance burns out, and also a voltmeter for the output of a power supply.

The normal bleeder resistance is made up of two branches in parallel, each branch having

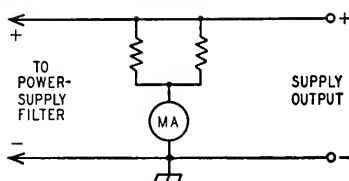


Fig. 2—Schematic of the improved bleeder circuit.

twice the resistance of the normal bleeder. A milliammeter connected in the common negative leads reads the normal bleeder current. If one branch of the bleeder opens up, the other branch will still discharge the filter condensers, but the meter reading will fall to half its original value, warning the operator that one branch has burned out and should be replaced as soon as possible.

If the branches are made of equal resistance, each branch of the bleeder can have half the power rating of the normal bleeder. If, for example, the normal bleeder resistance is 25,000 ohms, 50 watts, each branch can be 50,000 ohms, 25 watts.

The output voltage of the supply can, of course, be determined easily by multiplying the current indicated by the milliammeter and the bleeder resistance in series with it. When the branches are equal, this resistance will be half the resistance of either branch.

Any milliammeter will read directly in voltage if the bleeder resistance is 10,000 ohms, or 100,000 ohms, the voltage being 10 or 100 times, respectively, the reading in milliamperes. A 25-ma. meter, for instance, will read 250 volts full scale with a 10,000-ohm bleeder, or 2500 volts with a 100,000-ohm bleeder.

—Rev. Joseph A. Terstegge, W9LQE

[Caution: The bleeder circuit becomes inoperative if the meter opens up! —Ed.]



CONDUCTED BY EDWARD P. TILTON, WHDQ

**T**HERE are some 300 logs from the June V.H.F. Party already in the Communications Department files as we write, and with the reporting deadline still several days away more are arriving in every mail. A nationwide picture cannot be drawn at this time, so we will not attempt it until next month, but one thing is certain: the 6-meter band has staged a remarkable comeback. For the first time in several years, the downward trend of 6-meter participation in our contests has been reversed — and decisively.

Scattered through the correspondence accompanying the logs are frequent comments like "Sure glad to see the activity picking up on 6 again!" "Reminds me of '46, '47 and '48!" "Made 91 contacts on 6 this time, compared to an average of 40 in previous contests."

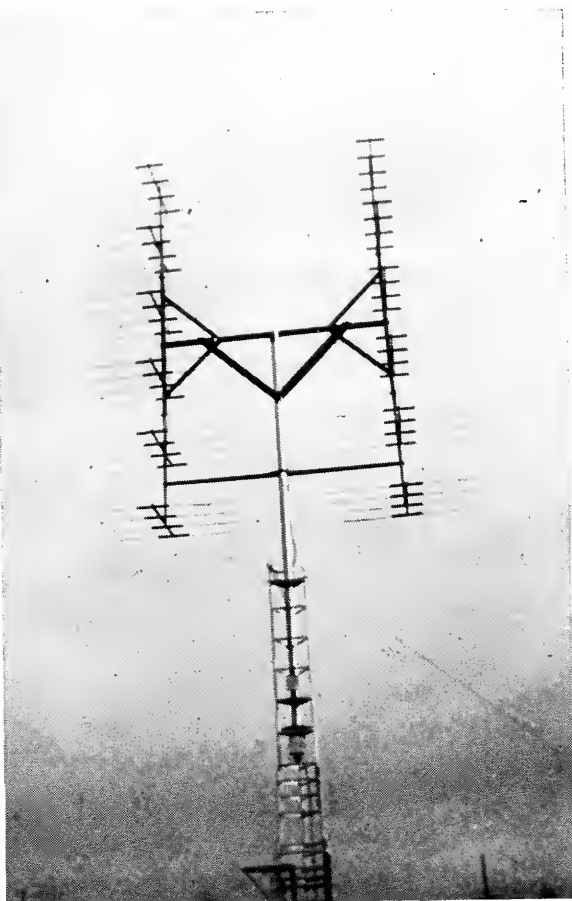
Obviously, the opening of the 50-Mc. band to Technician licensees couldn't have come at a more opportune time. The April 12th deadline gave the newcomers a running start on the 1955 sporadic-E DX season and, perhaps even more important, the knowledge that there would be some new calls on the band to work flushed out no small number of the old timers who used to be on 6, but have not bothered to get on recently.

Many fellows write that, for the first time in several years, they can now find something doing on 6 any evening, and occasionally during the daytime hours, too. It's certainly true in New England; we're not overwhelmed with QRM, by any means, but you can make casual contacts once again. When the band is open, states are heard that have been missing for the past two or three seasons. No longer is operation confined to the one "net night" each week.

This is all to the good, for 6 is too fine a territory to lie unused, DX season or any other time. Simple converters,

moderately-sized antenna systems, and transmitters that won't ruin the family budget provide consistent coverage that could easily take over much of the burden now carried by lower bands. Thousands of hams now knocking each other out (or trying to) in the turmoil between 3800 and 4000 kc. could work over much of the same territory on 50 Mc. with a fraction of the power — and no strife.

The 6-meter band is 20 times as wide as the 75-meter 'phone band, and as good or better, for distances up to at least 100 miles. On 6 you can use any mode of operation you like — c.w. a.m., f.m., teletype, s.s.b., duplex — with little or no worry about stepping on anyone else's toes. The static level is low most of the summer, and an ionospheric disturbance means DX, not a washed-out band.



◆

The biggest 2-meter antenna? W7LHL, Seattle, Washington, has 96 elements. Each bay of this gigantic structure has two half waves in phase, with reflectors and directors. With a high-powered c.w. rig and a low-noise converter, W7LHL is loaded for bear.

The TVI threat, once considered an insurmountable obstacle in Channel 2 areas, is being licked. There are many ways to do it. W2IDZ showed some of them in June and July, 1954, *QST*, and the considerable nightly 6-meter activity now observed in Northern New Jersey is evidence that he knew what he was talking about. As far as the other channels are concerned, eliminating TVI with a 6-meter rig is no more of a problem than it is on any other ham band; in most cases it's easier on 6. A 50-Mc. "TVI Special" is undergoing final tests in the ARRL Lab, as we write. It will deliver a clean and husky 40 watts, and you'll not find it difficult or expensive to build.

The series of articles for the beginner just concluded in last month's *QST*, and many other *QST* features now on the way, will help the cause along. If you're the type that refuses to build his own gear, at long last some of our more enterprising manufacturers are bringing out some real 6-meter equipment. If you've always been going to give 6 a whirl, there'll never be a better time than now to get about it. Could be you'll like it!

### W2UK Closes Down

To do an outstanding job in any phase of amateur radio requires a combination of the best in equipment and skill in operating that comes only from experience. Some of us have one of these attributes, but we miss the upper brackets of achievement in our chosen fields of endeavor for the lack of the other. This is no less true in v.h.f. work than in other kinds of hamming. A fellow who has ranked high in DX work, for instance, is likely to make a pretty good v.h.f. man, if he is thoroughly bitten by the bug. At least one did.

The thrill of working in a fast-developing branch of the art caught the fancy of Ralph E. Thomas, W2UK, back in the early '30s. DX men of the prewar era don't need to have his record recounted, but some of today's DX enthusiasts might be interested to see what one of the country's leading v.h.f. operators did before he began to burn up the 2-meter band.

We've just come out from under a pile of old *QST*'s with the following record of DX Contest participation by W2UK. In the first contest in which there was a scoring system, back in 1933, W2UK placed third in the N.Y.C.-L.I. section in a field of about 30. In 1934 he rated 14th in the country, second in his ARRL section. The year 1935 found W2UK up to 5th in the U.S. standing, with his country total third in the nation. By 1936 Tommy was the top W2, landing in 3rd place in the national ranking. In 1937 he posted the country's top score in the c.w. competition and set a new countries-worked record with 71. His station, operated by another v.h.f. man to be, W2HNY, also made the top W2 score on 'phone. First place again, and another country record, 76, were achieved in 1938. The last DX contest of the prewar period found W2UK in third place nationally, just a whisker behind the two leaders, with 80 countries worked.

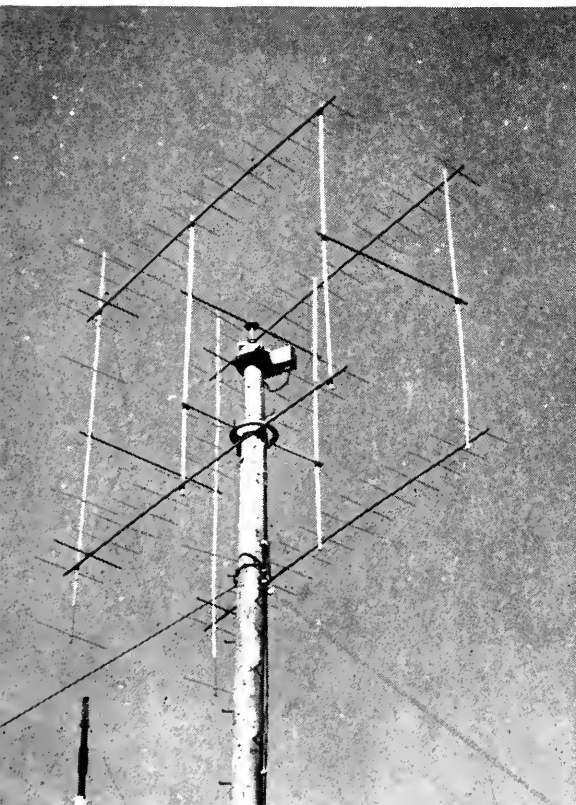
With this background, it is easy to see that W2UK was a sure bet to make his mark in v.h.f. work, once he tired of what he now calls the "d.c. bands." Tommy started in on 144 Mc. about five years ago with equipment not unlike that used by most 2-meter operators, then and now. His first 2-meter antenna was a 5-over-5, and his transmitter ran about 100 watts. He was just getting his feet wet taking a sampling to see if the 2-meter water was as fine as had been reported by some of his ham friends who were already in all over.

It was! Extended-range communication on a regular day-to-day basis was just getting under way on 144 Mc., and it appeared to W2UK, as to many of us, that pushing transmitter, receiver and antenna techniques to the limit would be bound to produce communication over distances then believed impossible on frequencies where ionospheric reflections were not involved. Before long the rig at New Brunswick, N. J., had been upped to a full kilowatt, and the antenna increased to 40 elements. Using c.w. mostly, and working in conjunction with W2AZL, W2NLY and others, Tommy was soon keeping reliable schedules on 2 at distances up to nearly 500 miles. His record of consistent schedules with W2ORI and W8WVX has never been equaled. And when the band was open, W2UK had a signal by which all other eastern stations were judged. By 1953, W2UK had assumed leadership of the W2s in states worked on 144 Mc., a position he shares today with two others.

In June of 1953, W2UK began what turned out to be one of the outstanding amateur projects of a v.h.f. nature of all time, the observation and recording of meteor-scatter signals on 144 Mc. Working with W4HHK, Collierville, Tenn., he spent literally hundreds of hours keeping schedules at all hours of the day and night. This work, reported in detail in October, 1954, *QST*, resulted in widespread attention of the most favorable sort being focused on amateur radio.

In the course of their daily schedules, W4HHK and W2UK proved that meteor-reflected signals from distances of 1000 miles or more could be detected consistently, with the duration of signal bursts occasionally reaching proportions that permitted the exchange of useful information. Thus was opened to v.h.f. men a wholly new means of making distant contacts.

The W4HHK-W2UK schedules came to a close June 5th, after exactly two years of the most intensive kind of work it has been our pleasure to report. The June V.H.F. Party was W2UK's closing fling. Though busy preparing



One of the reasons for the outstanding 2-meter signal radiated by W2UK was this 64-element array atop an 85-foot pole. Four 16-element Yagis, stacked two wavelengths vertically and one wavelength horizontally, survived hurricane winds that wrecked many lesser antenna systems. Another 2-meter array at W2UK had eight 5-element Yagis spaced one wavelength in both dimensions, four bays high and two wide.

**QST for**

for his departure for KH6, he found time to work 127 stations in 19 ARRL sections on 144 Mc. for 2413 points. This section total is at least 5 better than anyone else in the country was able to do on 144 Mc., even working the whole contest period.

The famous station at New Brunswick is now dismantled, but much of it is on the way to Kahuku, on the northeastern side of Oahu in the Hawaiian Islands, where Tommy will soon be taking up his new job with RCA Communications at their Kahuku transmitting station. Two-meter signals across the Pacific? We cannot escape the feeling that, if the job is to be done, here is the man to do it. One thing seems certain, at least: 2-meter interest, now just gaining a foothold in KH6-land, is due for a big boost. And while v.h.f. men everywhere will feel the loss of W2UK, they wait expectantly for 2-meter developments from Hawaii. Not the least of the possibilities: The same moon shines on both KH6 and W. 'Nuff sed!

### National V.H.F. Calling Channels?

If you've done much mobile work on the v.h.f. bands, you've probably thought many times how nice it would be if we had some sort of national calling frequency for the 6- and 2-meter bands. There's little need for this in areas where v.h.f. activity is high, but it would be convenient, when traveling in the hinterlands, to be able to set one's receiver on an appointed channel and be sure of hearing a signal if there is one to be heard. The question is "What frequency?"

There was some attempt in the heyday of the RASO work on 6 to make 50.1 Mc. a national calling frequency. There are plenty of crystals (8350 kc.) for this frequency extant, and it gets quite a play when the band is open. Trouble is, no channel ever seems to be used as a calling frequency only, even on lower bands, where such things are supposed to be standard practice. Would v.h.f. men around the country use one frequency for calling and another for carrying on a contact, once made?

We doubt it, from long experience in such matters shows that only a very few ever know that the arrangement exists. Still, there's no harm in trying. Let's make it 50.1 Mc. for calling, unless someone has a better suggestion. (It would help if the "beacon" stations would scatter around a bit.) What will it be in the 2-meter band? Offhand, we'd suggest 144.6 Mc. This is a popular surplus-crystal spot, and out of the low-edge QRM area. Can anyone suggest a better channel? Thanks to W6BCX for bringing the matter up.

### Here and There on the V.H.F. Bands

Expedition news that just missed last month's column: On May 28th, W6LIT and W6UID joined forces to provide Utah contacts on 144 Mc. for several W6s and W7s. They tried to reach Brianhead Mountain, an 11,315-foot elevation, but the road was still snowed in, so they had to settle for Zion Canyon View. This is a 9500-foot spot 18 miles east of Cedar City, Utah, and 45 miles north of the Utah-

Arizona border. Equipment was a 3E29 final stage, running 130 watts input on c.w., a crystal-controlled converter and BC-348 receiver, and an 8-element (W6GD type) horizontal array. Power was supplied by a gas-engine generator. Stations worked included W7VMP, Phoenix, Ariz., 300 miles, W7LEE, Parker, Ariz., 250 miles, and W6WSQ/6, 12 miles from his home in Pasadena, 375 miles.

The following morning they set up at Castle Cliff, a 3000-foot elevation about 7 miles inside the Utah boundary. Here they worked W6DNG, Compton, Calif., about 350 miles, and W6WSQ/6 again. W6DNG was the only home station worked in California, yet his signal peaked S7. The location of W6DNG is only 88 feet above sea level. W6NLZ was heard, but contact could not be completed. Polarization checks were made with W6WSQ/6, with no marked difference being observed between horizontal and vertical. A final stop at Wilson Pass, Nev., and several W6 contacts, completed the week end's work.

The W7VMP schedules, reported in May QST, have been kept regularly, but without significant results except with W5FAG, Albuquerque, N. Mex., and W6WSQ. These are mountainous paths of about 350 miles, in nearly opposite directions from Phoenix. W5FAG is heard on nearly every try, though two-way contacts have not been made regularly. W6WSQ is worked consistently, with barely-audible c.w. signals. Indications are that this path can be covered at just about any time, when high power, good receivers, large antennas and c.w. are employed. There are few rougher paths of 350 miles anywhere.

Perhaps the most pretensions v.h.f. expedition of all was just beginning to pay off as we write. W2QCY 7, complete with panel truck, a.c. generator, 45 watts output on 50 Mc., converter, receiver and beam antenna (not to mention low-frequency gear for liaison) was set up and ready for business at Wendover, Utah, June 22nd. Wendover being only 3 miles from the Nevada border, plans are to operate in both these rare states when the band is open. This trip of several thousand miles, months in the preparation stages, was made expressly for the purpose of providing eastern 6-meter men with a chance at Utah and Nevada, the two states now needed by just about everyone who lives east of the single-hop range.

The traditional late-June double-hop sessions produced hundreds of contacts for W2QCY 7, and for a similarly-equipped panel-truck station, W6ABN 7, Las Vegas, Nevada. Stan was busy for hours on June 26th, working W1s, 2s, 3s and 4s as fast as he could. We expect a flood of 50-Mc. WAS applications, as the result of the splendid job these two crews have done for the 6-meter gang. Those Nevada and Utah contacts have been a long time coming!

Interisland 2-meter contacts in KH6 are reported by KH6AED, Hawaii SCM. The first was made on the morning of June 5th, between the home station of KH6AED on Oahu, and KH6ELD, mobile, on Maui. The latter was atop Lookout Point, a 10,000-foot elevation at the top of Haleakala, the volcano crater on Maui.

Ralph E. Thomas, W2UK, at the controls of his 2-meter station at New Brunswick, N. J. Equipment included a 144-Mc. crystal-controlled converter, working into a BC-342, left, for quick band-scanning, or into an SX-88 for weak-signal DX hunting. At the right is the kilowatt rig for 144 Mc. Similar shots of W2UK can be found in the DX Contest write-ups of pre-war QSTs.



Odd-propagation department: W2ALR, Lockport, N. Y., heard the 2-meter 'phone signal of W1DXE, West Hartford, 325 miles, during the widespread aura of May 25th. There was only a slight rumble on the signal, and it was perfectly readable. This was about 8 p.m., when the c.w. signals from the aura were at their peak strength. There was no evidence of a tropospheric opening at the time. Just a few nights previously, Larry heard a pronounced echo on the c.w. signal of W2UK, when he was in contact with W2ORI, Lockport. The delay was estimated at 50 milliseconds. Question is, where was W2UK's signal going to give it a 10,000-mile echo?

DX chances lost: On the morning of June 5th, your conductor heard the 50-Mc. signal of W6ABN for a period of an hour or more, rolling in about as well as we've ever heard a West Coast signal on 6. W6ABN was knocking off the W2s and 3s rapidly, but no W1s. How widespread the skip was at that time is seen from the TV DX observations of K6EDX, Fresno, Calif., for the same period. Bob reports

that between 0630 and 1430 PST he picked up Baltimore, Norfolk, Va., Tulsa, Philadelphia, Washington, New York, Chicago, Montpelier, Vt., Kansas City, Kalamazoo, Mich., Rochester, Great Bend, Kans., Omaha, Green Bay, Wisc., Wichita Falls, Texas, Spokane, Wash., and Great Falls, Mont., on TV channels 2 through 5! Sporadic-E skip begins on lower frequencies, and goes higher; that is, the 50-Mc. band is open before, during, and after the TV channels. There was quite a bit of DX worked on 6 at that period, but the stuff on the TV frequencies gives some idea of what 6 might have been like if we had activity over the country in anything approaching 75-meter proportions!

### Horizontal Antennas for 2-Meter Mobile

In open country, at least, it's helpful to have the polarization matched between mobile and fixed stations. The general swing to horizontal has resulted in scores of ideas for horizontal mobile antennas. W2OW, Vestal, N. Y., has had fine results with a folded dipole taped to the rear window of his car. This can be fed with coax through a balun, or used with a balanced line. The dipole can be made of Twin-Lead, or of fine wire, the latter having the advantage of being almost invisible from even a short distance away from the car.

W9ULF, Oak Park, Ill., has a demountable set-up that has considerable merit. He cut a piece of 3/4-inch copper tubing one foot long, and bent it at the center so that when the lower portion is parallel to the door jamb of his car, the upper half is vertical. Two clips of thin sheet metal hold this tube in place, with self-tapping screws inserted into the door jamb. The copper tubing can be chromium plated, or painted to match the car, after which it is a nearly invisible socket for holding a removable mobile dipole.

The dipole itself consists of two 19-inch stiff wires, inserted in a triangular-shaped block of polystyrene. This mount is fitted over the top of a 1/4-inch aluminum rod 19 inches long, which is inserted into the socket when mobile work is in prospect. The dipole is fed with coax directly. A balun was tried, but with the short run of coax involved, it made no practical improvement in performance. The coax is 65 inches long.

If there is a tendency to rotation of the dipole when the car is moving, the vertical support can be wrapped in friction tape. Pushing it down in the socket tightly will hold it in position firmly.

### OES Notes

W2UTH, Victor, N. Y. — Many new stations coming on 6, some at the expense of 220 and 420 Mc.

W3OTC, Silver Spring, Md. — Appearance of Technicians on 50 Mc. is the best thing that's happened to the band in many a year. A high percentage of DX stations worked appear to be newcomers, and activity is well above recent years.

W4KKK, Rome, Ga. — Have 807 working fine as straight-through amplifier on 50 Mc., driven by 12BH7 as push-push doubler. A pi network is used for interstage coupling, with a 20- $\mu\mu\text{f}$ . variable capacitor on the 12BH7 end of the coil and a 40- $\mu\mu\text{f}$ . fixed capacitor at the 807 grid. The coil is 7 turns, 1/2-inch diameter, 3/4 inch long. The 807 is mounted in a shield made from a small can of the frozen fruit juice variety. No socket is used, contact being made to the 807 with pins removed from an old wafer socket. The cathode pin and one heater pin are soldered to the can. The 807 plate tuning capacitor is a neutralizing unit from a BC-375. With the tube mounted horizontally, a short heavy lead connects from the capacitor to the 807 plate cap, and the plate coil is at the far end of the capacitor. The effectiveness of the by-pass at the cold end of the 807 plate coil was improved by enclosing it in sheet aluminum. The amplifier is completely stable at all settings of the tuning controls, and no parasitic chokes are needed. It runs nicely at 65 watts input, with 650 volts on the plate.

With phase modulation most Channel 2 TVI that developed with a.m. is cleared. The closest receivers can be handled nicely with a W2IDZ filter. See July, 1954, QST, page 33, for details.

W5FPB, Albuquerque, N. Mex. — New V.H.F. Club now officially organized, with W5FAC as president, W5VWU, vice president, W5FJE, secretary-treasurer, and W5ECS, activities manager. Working with local e.d. officials and

(Continued on page 128)

## 2-METER STANDINGS

Call	States	Areas	Miles	Call	States	Areas	Miles
W1RFU...19	7	1150		W6ZL...3	3	1400	
W1HDQ...19	6	1020		W6BAZ...3	2	320	
W1CCH...17	5	670		W6NLZ...3	2	360	
W1IYZ...16	6	750		W6MIU...3	2	240	
W1UIZ...16	6	680		W6GCG...2	2	210	
W1HEO...16	5	475		W6QAC...2	2	200	
W1KCS...16	5	600		W6EXH...2	2	193	
W1AZR...14	5	650					
W1MNF...14	5	600		W7VMP...5	3	417	
W1BCN...14	5	650		W7JU...4	2	247	
W1DJK...13	5	520		W7LEE...4	2	240	
W1MINN...10	5	520		W7YZU...3	2	240	
				W7JCO...3	2	140	
W2ORI...23	8	1000		W7RAP...2	1	165	
W2UK...23	7	1075					
W2NLY...23	7	1050		W8BFQ...29	8	850	
W2AZL...21	7	1050		W8WXY...28	8	1200	
W2QED...21	7	1020		W8WJC...25	8	775	
W2BLV...20	7	910		W8LPD...23	8	—	
W2OPQ...19	6	—		W8RMH...22	8	690	
W2DWJ...18	6	632		W8DX...22	7	675	
W2AOC...18	6	660		W8SRW...20	8	850	
W2UTH...16	7	880		W8SVI...20	7	—	
W2PAU...16	6	740		W8WRN...20	8	670	
W2PCQ...16	5	650		W8RAN...20	8	685	
W2LHD...16	5	550		W8JNV...18	8	650	
W2CFE...15	5	325		W8EP...18	8	800	
W2DFV...15	5	—		W8ZCV...17	7	970	
W2AMJ...15	5	550		W8RWV...17	7	630	
W2QNZ...14	5	400		W8WSE...16	7	800	
W2BRV...14	5	590					
				W9EHN...24	7	725	
W3RUE...23	8	950		W9FVJ...23	8	850	
W3NKM...19	7	660		W9BPV...23	7	1000	
W3IHH...19	7	650		W9EQC...22	8	820	
W3BNC...18	7	750		W9KLR...21	7	690	
W3FPH...18	7	—		W9UCH...21	7	750	
W3TDF...18	6	720		W9ZHL...21	7	—	
W3KWL...17	6	750		W9KPS...19	7	660	
W3LNA...16	7	720		W9MUD...19	7	640	
W3GKP...15	6	800		W9REM...19	6	—	
				W9LF...19	—	—	
W4IHHK...26	8	1020		W9ALU...18	7	800	
W4AO...23	7	950		W9GAB...18	7	750	
W4PCT...20	8	—		W9GJA...18	6	720	
W4JFY...18	7	830		W9WOK...17	6	600	
W4MKJ...16	7	665		W9MBI...16	7	660	
W4CMF...15	6	600		W9BOV...15	6	—	
W4ONC...14	7	500		W9LEE...15	6	780	
W4JHC...14	5	720		W9DSP...15	6	760	
W4WCB...14	5	740		W9JNZ...15	6	560	
W4TCR...14	5	720		W9DDG...14	6	700	
W4UBY...14	5	435		W9FAN...14	7	680	
W4IKZ...13	5	720		W9QKM...14	6	620	
W4JFU...13	5	720		W9JTY...13	6	560	
W4TLV...13	5	700		W9CIA...12	7	540	
W4UDQ...13	5	800		W9ZAD...11	5	700	
W4ZRU...10	4	800		W9GTA...11	5	540	
W4WNL...10	4	500		W9JBF...10	5	760	
W4HJQ...10	4	500					
W4MDA...10	4	680		W0EMS...26	8	1175	
				W0HID...24	7	870	
W5RCL...21	7	925		W0GUD...22	7	1065	
W5JFI...19	7	1000		W0CNQ...17	6	1090	
W5AJG...14	4	1260		W0INI...14	6	830	
W5QNL...10	5	1400		W0OAC...14	5	725	
W5CVW...10	5	1180		W0TJF...13	4	—	
W5ABN...10	3	780		W0ZJB...12	7	1097	
W5MWW...9	4	570		W0WGZ...11	5	760	
W5ML...9	3	700					
W5ERD...8	3	570		VE3AIB...20	8	890	
W5FEK...8	2	580		VE3DIR...19	7	790	
W5VX...7	4	—		VE3BQN...14	7	790	
W5VY...7	3	1200		VE3DER...13	7	800	
W5ONS...7	2	950		VE3BFB...13	6	715	
W5PSC...7	2	500		VE2OK...12	5	550	
				VE3AQG...11	7	800	
W6WSQ...5	3	1380		VE1QY...11	4	900	
W6DNG...4	2	350		VE1FJ...2	1	365	



# How's DX?

CONDUCTED BY ROD NEWKIRK,\* W9BRD

## Who's Where:

This being a prime vacation month we'll dispense with our usual abstruse DXhortation and choose instead to help beef up your DX reference library. Avid DXers en route DXCC haven't much time to sit around indexing their QST files and questions like "Now where did I see a picture of FG7XB?" often arise. So, as an excerpt from records that Jeeves maintains for our own convenience, here's a tabulation of photography that appeared in "How's DX?" over the past three years (asterisks denote equipment only):

## 1952

*July:* GM2DBX; PY2CK, W1ZD; VP5s BD BE BH BP; KW6AR.\* *August:* AP2N, VU2DY; HZ1KE; MI3US ops. *September:* AC3PT; W1FH; VQ4ERR, ZS6Z, MI3US.\* *October:* JA2KW ops; VK1BS; ZL1MP.\* *November:* ZS6BW; PY2RT; KG4AF; DL4JN. *December:* DU1CE; JA6AA; VP9OO; EA2s CA CQ; KA2KW.\*

## 1953

*January:* HK ops; VP3LF; OX3SF; HB9GJ. *February:* IS1AHK; OE13JR; Mass. DXCC ops; PY1DD; TI2s BR DL PZ TY. *March:* CP1BX; 984AX; MP4KAC; KC6QL; ZS3G.\* *April:* LZ1KAB; CT1CL; SM5s LI RM, 4X4BX; KB6AY\*; KL7AFR. *May:* VK3HW; V89AW; ZM6AX; VP8AE\*; JA1AH. *June:* CE3CB; KG6HL, W1FH, W6LW\*; ZS2MI\*; DL1EZ. *July:* PY2CK; YV5FL; ZL2AV; W1MCW; W2AOS/KG6. *August:* AC4YN; CR3AC; PY2CK\*; CR6AI; KP4UB; VESBV. *September:* LU4ZI; IT1TAI; SV0WVG; YU1BCD. *October:* SM5KP; MP4BAF; PY4HE; KR6s LL LW; V86BE. *November:* HB1JJ/HE; FO8AI; KV4BB; HZ1AB ops; ZS6DW. *December:* ZL1HY; EA1AB; IIAOF; ON4NC; 4X4BR; DU7SV.

## 1954

*January:* JY1US; EA9DD; PY1AA ops, W3BSO. *February:* KJ6AY; ZE3JP; KF3AB; KH6MG; WIATE; W9DXCC ops. *March:* FKSAB; OQ0FG; VS2DB; ZK1BG; SP2KAC\*; G3IDC; OQ3NK. *April:* KG6AEN; KA9LJ; KA7RC; KX6BU; ZE (LMIRE) ops; W9AND; KR6s AZ BA IT. *May:* CR6CZ; KA2HQ ops; EA9s DE DF; ZL2JB. *June:* HH2OT; PZIWX, W2BVS; VQ2W; CX5AF\*; ZC4s CA FB GF JJ PB. *July:* NE1NMC; CT2AG; ZB2A.\* *August:* Dayton Hamvention DXCC ops; GM8MN, W1 friends; TA3AA; HK1TH; HB1KB, HB9s KB RQ; VK9OK.\* *September:* HZ1AF, W2XXM; ZL1CI\*; KL7PI. *October:* W6TI's QSL bureau; F8FW/FC, F9QV, HB9LA; GM3DHD. *November:* ZK1s AA AB BG BH BI; W2MHQ\*; KA4MA, KA2DX, KA8AB; CN8MM. *December:* ON4VY; OQ5ZZ ops; MP4QAH\*; EA6AW; HK0AL.

## 1955

*January:* DU1CV; VE7ASL (ex-VR2CD); JA6AD; HB1MX/HE; YU1GM, OZ1FM, SV1SP, G2MI, DL1DH, OE5HN. *February:* GB3NCB; VS6AE, W0YDZ; HB9X; CR8AB\*; KC6KU. *March:* CT1CB; FB8BC; W0YDZ; KG6\*; FG7XB; VESs OG SD SM YT ops. *April:* FP8AK/VP2, VP2VA; W2ZIK, ZL2s ASL GQ JF; DU6RG; K6EUV\*; SM5ARL\*; Famagusta ZC4 ops. *May:* CN8ML; SM5RM; XZ2OM; HA5KBA.\* *June:* G3AAT/OX; CR7CI; VP1GG; OY7ML.\*

It's only fitting that we recap credits, too.

\* Please mail all reports of DX activity to DX Editor Newkirk at 4128 North Tripp Ave., Chicago 41, Illinois.

Here are the guys and groups that were good enough to entertain you by the loan of those pic:

W1s APC FH NWO WTE, ARRL Hq, W1s, W2s A1S ESO HK HOB MUM TXB; W3s ANT VES/1; W4s BEW HYW TJ YZC; W5s KUC M1S UUK; W6s BES EAY GPB MUR YY; W8s IV SHW YJB; W9s BDW FKZ HLE MQK RBI TRD; W0s AJL VFM, CT1CB, DU7SV, DL4LQ, Gs 2MI 4ZU, HB9CZ, HE9RDX, KC4AB-W1QCW, KH6ALM, KL7AFR, LU5CK, VP3WO, YU1AD, ZS6BW, 984AX, No. Calif. DX Club, W. Gulf DX Club, Salt Creek Radio Club (W9AV), RSCB, USKA, National Geographic Society; Portland Oregonian and Chicago Tribune.

If, as the Chinese long ago put it, each pic is worth more than 10,000 words, these parties turned in plenty of DX column copy during those past 36 months. Our efforts to document doings in the DX world are greatly enhanced by such coöperation. A special salute to OT contributors *au fait* W6YY and W8IV who helped doll up three separate DX columns since July, 1952.

Incidentally, for the statistically inclined, it is of interest to note that a check with the ARRL DXCC Countries List reveals more than 100 countries represented in the preceding photo index. That's a fairly fast DXCC for your "How's" picture gallery!

## What:

Time was when July and August were one-band months so far as the northern latitudes world of DX is concerned. The band, of course, was 20. Thanks to the happy acquirement of a 15-meter band and an assist from the valley of the solar cycle, North American amateurs now get hot-weather DXercise on a variety of frequencies. Hop on our "How's" Bandwagon and see for yourself, OM, bearing in mind that in the text to follow, frequencies (given in number of kc. above the lower band-limit) appear in parentheses, times without. E.g., (9) = 14,009 kc., if the paragraph deals with 20-meter work. Times are GMT, using the nearest whole-hour figure such as 7 for 0720 or 0650, 0 for 0015 or 2349. As a rule each DX call is mentioned but once per band.





SM2VP's Piteå, Sweden, hamshack displays a severe Scandinavian motif. An ARRL member since 1930, Helmer usually can be found on 14,080 kc. on week ends, with p.p. RK20As feeding a rhombic and other long-wire antennae. The receiver is an NC-1B3D.

**20** 'phone is a good starting pointing for our megacycling and WACVX give us part of the reason why: **FP8AP**, **H8C8I** of the Galapagos, **HK0AI** (188) 16, **OD5AB** (121) 2-3, **TF2WAI** (130) 15, **VP5AE**, **ZB3 IAAX** and **ZB2A**. Tommy's new Telrex drove his 150-watter home to 70 fast A3 countries. . . . **KG4AP** (W4DNE) ran down **DUT8F** (184) 14-15, **H06EC**, **KA0IJ** (190) 13 of Iwo Jima, **KG1AA** (240) 23, **VR3 2AP** (150) 4 and 3C. . . . **W9RBI**'s recent 60-minute 14-Mc. 'phone WAC -- **ZS6QW**, **KA3JN**, **W3JNN**, **LU5NE**, **DL4RM** and **VK2AFS** -- adds to the stack of evidence on hand indicating the early return of a more cooperative Kennelly-Heaviside stratum. . . . **W7VMP**, whose two triplet brothers also have calls, forsook 144 Mc. in order to capture **DUIVVS** (170) 15, **F08AK** (160) 1-3, **VR2s** CW 4, **CZ** 4, **VSs** ICZ 12 and **4CT** (120-180) 14. Bob and **W9RBI** were among the fortunate to work **V54CT** (G3DCT) as **V55CT** before he shut down his Brunel installation in favor of Sarawak diggings. . . . **BV1US** (250) 13-15 continues to make firings and influence people, **KL7ZG**, **Ws 6YY** **SYIN** 9FDX 9GPI 9RBI and 9WHM are included in the many who'll receive that Formosa QSL. . . . **W9WHM** was the first Hoosier QSO for **CG6CG** (260) 9. John also contacted **FY7YE**, **KX6BU** (240) 7, **TA3US** (107) 22-3, while **YI3AM** and **YK1AE** escaped. . . . **AP2U** 15, **JAG6IK**, **LZ1KSA** 14, **OE13USA** 14, **ST3s** AM 17, **DB** 17, **SU1CN** 20, **SV0WK** 16, **VS1FS** (111) 15 and **4S7MG** 13 vocalized with **IIZ1AB**. . . . **Serumptions ACs** 3PT (114) 14 and 5SQ (114) 14 raised the eyebrows of **W6YY**. . . . **F08AB** (30) 4, **OY2Z** (182) 19, **VK9RM** (164) 11, **VR6AC** (142) 2-4 and others are listed in the Milwaukee Radio Amateurs' Club DX newsletter. . . . Northern and Southern California DX Clubs and the West Gulf DX Club list the following collection of 14-Mc. radiotelephones, the latter outfit contributing the lion's share: **DUIVCY** (199) 15, **ET2s** WS (173) 18, **XX** (184) 4, **FA3ZG** (136), **FB8AM**, **F08AD** (30) 6, **CG6FQ** (166) 15, **GD2FRV** (140) 7, **HO1EH** (77) 1 -- see "Whence", **HZ1s** AB (107) 0, **TA** (134) 0, **CG6AJ** (207) 11, **KG1Bs** BO (235) 3-4, **FR**, **KM6AX** (209) 6, **KR6s** KS (175) 13, **LJ** (121) 13, **NP** (175) 11-12, **PI** (175) 11-12, **MP4QAI** (143) 3, **OD5AD** (119) 3, **OK1MB** (138) 4, **OQ5s** FO (131) 20, **PE** (131) 22, **SP5AH** (110) 12, **SV8s** WM (120) 19-20, **WS** (109) 1, **TF2WAG** (161) 15, **W4IC** (132) 7 of Willis Islet, **VK9s** GV (115) 7, **MX** (176) 7, **OK** (126) 6, **RH** (130) 2, **VQs** 4FK (115) 12, **5FS** (154) 20-21, **VR2s** AA (138) 16, **AM** (342) 5, **VS1s** AD (110) 15, **FJ** (180) 15, **FO** (109) 15-16, **FU** (180) 15, **GT** (161) 15, **EW** (232) 15, **VS2s** DB (187) 15, **DQ** (151) 15, **DS** (170) 16, **DT** (178) 15, **DY** (127) 14-15, **DZ** (170) 14-16, **EF** (249) 5, **VS6s** AE (101) 15, **BE** (111) 15, **CL** (110) 13, **CW** (170) 15, **VU2s** CT (137) 15, **ET** (187) 17, **FX** (122) 16-17, **YO3GM** (130) 2-3, **YI1GM** (110) 3, **ZD3BFC** (105) 18-19, **ZK1BI** (178) 16, **ZM6s** AR (152) 5, **AS** (160) 5, **AZ** (160) 5, **ZP5AY** (163) 0, **ZS3AB** (138) 18, **3V8s** AS (189) 3, **WK** (165) 6, **4S7SL** (167) 14, **4X4s** DK (150) 21, **FQ** (153) 4 and **5A4TU** (120) 20. . . . 20-meter A3 vigilance by *Newark News* Radio Club vigilantes culminated in the logging of **G3VA** (205), **CPs** 4DF 5EK (160) 23, **CR6AF**, **CS3AC** (305) of Azores, **DUIAF**, **ESs** 8AP 8BK 9AR (145), 9BC 9BH (165) 21, **ET2AB**, **FASAG** (195) 7-8, **FM7WQ** (130), **FR7ZA** (115) 14-15, **HBI1MX**, **HGs** 6CR 81N (160) 3, **HUs** 2LR 2PB 3L, **HK6s** ES FI, **HR3HH**, **ITBEXN**, **KC6UA**, **KG6s** AA NAA 3, SB of Saipan, **KH6ABH** on French Frigate Shoals, **KR6s** AB AF AI 12, **DQ** NK OO PR TI USA, **KT1s** DD WX (210), **KV4AA**, **KW6BB**, **LX11D** 22, **MP4NL**, **OQs** 5FN 6DZ, **TA1AI**, **TF2WAF** 22, **TG9s** KF (190), **RR TU**, **VK9DB**, **VPs** 1AB (185), **2DN** (14) 1, **2GW**, **7NI** 7NJ 7NS (145), **VR2AP**, **VQ4s** EU FQ, **VSs** 1BA 2DC (181), **2UW** (190), **W9RJV**, **VES** at Resolution Island, **YI2AM** 0, **YS1s** JR (195), **MS**, **ZB2A**, **ZD4s** BR BT, **ZM6AT** (160) 5-8, **ZS2MI** on Marion, **4S7YL**, **4X4s** BG 0, **CR** (185) 0, **CX** GB, **5As** 1TK 2TJ 23, 2TZ 23, **9S4s** AC (150) 22, AD 23 and BS (131) 0. Twenty-'phone WAC should be a snap with all these Japan actives specified available by NNRC: **JAs** 1ANR 1GV 1MP 1 MR 1MT 3BB 4BB 4JH 5AF 6AA 6HK 8AA 8AA 8AA, **KAs** 2AJ 2CC 2CY 2EAE 2GE 2GE 2WJ 2WJ 2K 2NA 2OG 2OJ 2RM 2RR 2SM 2SV 2VS 2WW 2YA 3EB

**20** c.w. deals them off the third or fourth layer and has many an ace up its raveled sleeve. With 250 watts on an 810 he's been using since 1938 **W0ELA** reeled in **MP4s** JO (40) 4, **QAL** (75) 3, **VQ6LQ** (66) 0, **YJ1DL** (6) 4, **ZDs** 3A (60) 23 and 8AA (4) 23. . . . **W8YIN** got that **ZD3** as well as **ZM6AS** (68) 5. Mickey notes that **ZD3A** begins tuning 30 kc. below his frequency while the **ZM6** prefers calls 10 or 15 kc. higher than zero. . . . **FK8AE** (65) 4, **F08AK** (85) 2-3, **H8NU** of Trieste, **JZ0PS** (34) 16, **SP9KAS** (44) 4-5, **VK9AU** (32) 12-13, **VRs** 2AB 3, 6AC, **VU2AS** (16) 15, **9S4AX** (30) 15-16, **W7VMD/KG6** and **W0LKO/KG6** worked Arizona's **W7VMP**. . . . **W1OJR** tangled with **FY7YE** (80) 22, **GD3s** IBQ (60) 21, **IYS** (60) 22, **UB** (40) 16-17, **JA9BE** (55) 12, **KAs** 2CR (60) 12-13, **2OJ** (70) 13, **5HM** (82) 12, **SPs** 5AA (60) 20-21, **SKAF** (52) 1-2 and **SU1IC** (62) 2-3 who says he's the only legit Egyptian station active. **W1OJR** adds one **DXF-1** and another **ZP6CR** to the question-mark list. Vie pats gadabout **W6BYB** on the back for snappy Caribbean-style **DXtra**circular work at **FM7s** WD WF, **FY7YE**, **FG7XB**, etc. . . . **W4QCW** (**KC4AB**) did all right on **KW6BB** (30) 13-17, **OY2Z** (51) 4-13, an **MP4**, **UQ2AN** (56) 12, **VK9OQ** (20) 7-12 and **VS6CG** (84) 14. Bob decries certain hoghish members of the **QRO** contingent who must demonstrate how well they get out by repeatedly working a juicy one for the purposeless exchange of RSTs and inane clichés. . . . **W9BZW** is a new customer who reports raising **EL2C** (68) 22, **FA9VN** (24) 0, **HK0AI** (53) 0, **OA4J** (87) 3 and **OK/YUS**. George measures his shortie 3-el. rotary at 5 db. forward and 25 db. front-to-back -- not bad! . . . **VP9BM**, of **W8OSL** and Turkey fame, clobbered **ESs** 9AP (61) 22, 6AC, **FD8AC** (1) (63) 23-0, **F08AB**, **HG1FG**, a Qatar **MP4**, **VK9DT**, **VU2RC** (57) 2, an **OY** and **4S7WP** (33) 4. Jules noticed that the **FD8** slipped and started to sign another call on come-back. . . . **CO2YB**, **KL7AON** and **3V8AN** (50) 21 are good catches from **HZ1AB**'s bailiwick. . . . **W1WAI** got back in action for **CR4AF** (45) 23-1, **FG7XB** (91) 18, **15LV** (88) 14-19, **KG1IB** (**W1KWM**) (66) 23, **LZ1KSI** (64) 22-23, **VQ5FS** (46) 19-22, **YO3RF** (75) 19, **3V8AB** (30) 22 and **4X4FK** (50) 0. . . . Improved 14-Mc. conditions inspired **K6ENX** to trap East German **DM2ABK** (60) 6-7, **DUIVCY** (60) 15-16, **FY7YF** (5) 2, a Trieste **II**, **JZ0KS** (70) 17, **KG1AA** (40) 5, **VP1FL** (60) 15, **VP8BD** (50) 15, **VSs** 1GJ (55) 15-16, **IG1** (50) 15, **1GS** (90) 16, **2EM** (65) 15-16, **6CR** (80) 2, **VU2ET** (50) 15 and **4S7KH** (60) 15-16. . . . **K2BZT** switched allegiance from 80 to 20 meters, and small wonder: **FB8AK** (7) 17, **FF8AJ** (60) 21, **F08AL** (39) 1, **GM3s** AM (70) 22 and **GZA** (20) 1 of the Hebrides, **HAs** 5BU (77) 23, **5KBK** (63) 23, **7OL** (17) 1, **JAs** 2CZ (68) 15, **3DY** (20) 14, **5AB** (50) 14, **7AD** (62) 13, **9CW** (85) 12, Aaland **OHs**, **UA4KPA** (17) 20, **YO3RZ** (44) 21, one **ZAIKAD** (14) 23, **ZC4s** IP (10) 21, **VP** (70) 19, **4X4s** BR (85) 20, **BT** (80-95) 20, **FF** (92) 22, **FR** (90) 23, **IE** (49) 20-21 and aforementioned **EL FY7** 15 **LZ VQ6** **ZD3** items. Hayden is sporting Worked Vermont Certificate No. 43, "Which means they're a darned sight rarer than DXCC!" . . . **W0DBX** fled away **F9YFP** (31) 21, **FB8BR** (50-74) 13-14, **JAs** BR CA 14, **KG6AFT** 14-15, **W6TMM/KG6** 13, **TA3US**, **VK1IV** 7, **VS6s** AE (88) 13, **CW** (93) 13, **DB** DE (48) 13, **ZD9AB**, **ZP5EC** 15, **4S7NG** 13 and **9S4BN** 17. . . . **W0VFM** caught **CN8ED** 21, **EA6AU** 21 of the Balearics, **HR1MC** 17 and **TF3AB**. . . . At **W4YZC** we find the scraps of **CX1FB** 23, **JA6s** AA 1HK 12, **LZ1KAB** (60) 2, **SV1SP** (19) 4-22, **ZG4GF** 20 and **4X4BD**. . . . **KA7DM** (10) 3, **KM6AX** (64) 3 and **KR6OO** (60) 4 came back to **W7UJL**. . . . **W7TMI** does a good job out in the DX badlands: **CN8EB** 3, **DM2ABL** 6, **FM7W7** 22, **JAs** IACA 7, 1GW 9, 7DK 6, **KA2CG** 8, **KJ6BH** (87) 3-4, **TF3ZM** 3, **VPs** 6KL 5, 7NZ 1, **ZP5GM** 2, and **FG7 FO8 II**/Trieste **V81 VS6** **YO** 984 trophies attend. . . . **JA6AD**, who lends his communications talents to Nagasaki Radio, mentions working **EA9AB**, **MP4BBE**, **SU1SB**, **SVs** 1AB 6WR, **TF5TP**, **V08GB** (90) 16 and **ZD2HAI**. . . . **W0UKG** scraped up **CE7AK**, **HA5BL**, **LX1CW**, **SP9KAD** (40) 20-22, **Turks VP5s** BM (13) 19, **DC** (25) 2, **ZB1DK**, a **4X4** and suspect

3A2 to reach 128/117. FB8XX, FQ8AA, LUIZG and several U stations weren't having any. For a little DX excitement Doug digs into pile-ups with his 28-watt 2E26 exciter although the 813 stands by for rough going. . . . . Seven short months on 20 c.w. resulted in 116 countries for K2GMO. Bob's latest successes include CP5EP (3) 21, ET3LF (35) 18, FF8AC (30) 20, HA7KLA (60) 18, HE9LAA (51) 21 of Liechtenstein, HZ1HZ (44) 20, an armful of JA/KAs, KG6NAB (62) 11, OY7ML (25) 20, VP2GW (87) 22, VQ4FM (10) 17, 4X4s CK (25) 21 and FQ (44) 21. . . . . SP6WF, TF3KA, YO5LD, YV3FS and 5A4TK are among W3UX's shiny collection. Jon also bumped into 4X4CR/MM, Swiss Army station HB4FE, Swiss aircraft HB1QN and K4A19G/AM in a U. S. Navy blimp. . . . . Gleanings from logs in this slack and that slack, at W1YLM: VK9GB (49) 13, W3GVZ: Aaland OH1s, VS1 VQ5 VQ6, suspect PX1AA, ditto YA6s BBR GAL, W2TKG: YN1PM, HK9, K2BKU: EA9DE 22, K2EUH: HB1HT, KG1, KG4AB, PJ2CJ, VP7NX, K2HZZ: SL5AN of the Swedish military, W3TTH: IS1CFC, XE1H for a fast QSL; needs dope on W0WLO/SV2, W4TTP: LA4RE, who says LB8VB should be back at it from Spitzie by now, W5CAV: DM2ADL, DUICV, HBLF (50) 10 of Trieste, JA1AH, OA5B, VEAPX, YN1KK, YV5AE, W5HTS: DU7, TI2CR; heard VR2AR (5) 3, W6NJU: Trieste, OE5BW, VR2BZ (60) 6, a Thule KG1, YU2GW, OH5NR/MM off Ceylon, W6QAR: the preceding maritime-mobile OH5 who runs but 5 watts to a 2516 hnal around 14,100 kc, W6Y1Y: KP6AK, whose Palmyra QSL reads, "Population 1—Me," W3BJ3: CR4AO, ET2MK, W0UWV: IT1TAI 1, SV9WT (80) 23, LZJZC: FR7ZA 16, UG6KAA 12, VK1EM 17, YK1AH 16, one ZA2B 16-17, ZD9AC 18-19, KL7BBV: FO8AL, KC6AJ's Heathkit 25-watter. . . . . WGDXC's DX Bulletin supplies us with 14-Mc. c.w. notes on AP2Y (80) 1-2, CRs 4AL, 6CG (43) 22, 7AD (48) 13, 8AB (20-60) 2, 9AE (85) 7, 9AI, 10AN, CT3AB (32) 19, FF8AP (80) 1, FK8s AH (62) 4, AJ (9) 6, FU8AA, FW8s AA AB, HB1RM (50) 23, IS1AHK (3) 22, KC6AI (42) 5, KR6s AB (80) 18, AP (50) 11, LJ (40) 13, OL (55) 14, USA (10) 18, K1EXO (46) (23-0), LX1RB (100) 15-16, LZ1KAA (70) 5, SPs 1KAA (80) 22, C1 (13) 0, 9KJS (57) 12, ST2AC (5) 23, TF3MB (10) 1, VK9RM (9) 13, VP3YG (2) 0, VS1s BJ (81) 13, BL (48) 13, EI (94) 15, GI (32) (2) 0, VS1s CH (45) 16, CV (43) 15, DF (74) 1-2, DW (14) 15, VS2s CH (45) 16, DD (70) 15-16, VS6s CQ (22) 12, CT (15) 15, EI (87) 15, EQ (70) 15-16, VS6s CQ (22) 12, CT (15) 13, DC (2) 14, DD (18) 14, DC (2) 14, OD (52) 14, VS9AF (34) 23, VU2s CY (80) 16, MA (60) 19, NR (50) 20, YO3AR (50) 18, ZCs 2PJ (81) 22, 3AC (74-80) 15, 4NFD (38) 20, ZDs 2WAF, 4AQ (50) 19, 6BX (73) 12, 6RM (64) 12, ZK1AB, one 3A2AM, 4S7GE (70) 16, 4X4s AE (64) 23 and H (40) 22. So much for the Hot Slot. . . .

**15 c.w.** DX possibilities are gaied by several Novices this month. KN2KHZ's Globe Scout, NC-98 and 70-foot wire had a hot time with Gs 5FA 0, 6RC 0, GW3YR 1, KP4ZA 0-1 and LU1DFH 2. . . . . KN4BBR was delighted by LU1EK's reply. . . . . WN3ZKII made it 17 countries on four continents by way of DJ1VL, DL6s GB KF, DL7BA, FSTQ, G5CR, KG4AV, LU7s 7FAL RDDH 9DAZ, OK1IH and YN1AA. . . . . Back with the General genre, KR6LJ enjoys 21-Mc. c.w. and writes of many European QSOs, DM2ABL, FASRJ and JA1ACA. Frank was intrigued to note that DU7SV's favorite frequencies, as listed recently in "How's", jibe precisely with his own. KR6LJ lays the blame on the oodles of war-surplus SCR-399 crystals kits scattered around the globe—even U.S.S.R. hams cluster 'round 7020 and 14,040 kc. . . . . VK2GW and VP9BL make the 69th and 70th 15-meter c.w. countries for W1CTW. . . . . OA4C 14-15, PY7AN, SU1XN/ZC4 9-10, VS6s AE CQ CZ, YO3RF 15 and ZC4PB 12 show up on ZD6BX's scorecard. Vic states that ZS7C still flits about 21-Mc. radiotelegraph frequencies now and again.

**15 'phone** is going great guns. KL7ZG recommends CP5EK, OQ0DZ, VP5SC, VQ4EU, 4X4s BD and B1, to while away a Sunday afternoon. . . . . W7PEG picked up HC1RT, HR3HH, VK9DB (350), YV5AP and heard the voice of FM7WQ. . . . . W6ZZ, with 70 countries on 21 Mc. and 63 of those via A3, lists CE3QK, DL6TD, KP4WR, KV4BD, several KZ5s, YV5EW, ZLs

As VP8AQ in the bleak South Shetlands, Graham Davis whiles away long off-duty hours through contacts with ham acquaintances around the world. VP8AQ employs an RCA rig running 350 watts (250 watts on 'phone), a Marconi CR-100 receiver and radiates with a 90-foot wire on 7, 14 and 21 Mc. CR-100s do ham-band duty for many stations throughout the British Empire.

## CAUTION

Under this country's treaty obligations and on formal notice received from other nations, FCC-licensed amateurs are warned to engage in no communications with stations in the countries listed below. This is in accordance with FCC Public Notice of December 21, 1950 (p. 23, Feb., 1951 QST), and as since revised.

French Indo-China (Cambodia, Laos and Viet-Nam), Republic of Indonesia, Iran, Korea, Thailand. Prefixes to be avoided: F1S-X1S-31S, PK, EP-EQ, HL and HS.

280 4LA and these MMs: Ws 1Ks 10SF 1RZA 1UWV 30ZA and K2CIT. . . . . CT1OR, PZ1RM, ZB1CA and sundry Europeans replied to W4UWC. . . . . W4NQMI has 95 ARRL DXCC Countries List items checked off on 15 'phone after four months. E1SL, FY7YE, GD3IBQ, VP3VY and ZD9AC are among Sparky's latest. Friend W4WYM has 66 countries with a mere 35-watter and adds KT1WX and YN1LB to the 21-Mc. 'phone grab bag. . . . . CEs 2BO 2DD 3CZ 3H1 6AB, CN8s CG GL (185), CP5EQ/CP6, CR9AH, CT3AN 19, CXs 2AX 2CO 5AF 8AA, Eas 8AI (150), 9BC, FASRJ, FF8AP, H1s 2W 2X 7W (W6-style), HR1s CB LW KS, KV4BB, KW6BB, LX1BU 22, MP4KAC 22, OAs 2A 5G, OD5s AG AJ, OQ5s BI RU, TIs 2BX 2VJ 3LA, TG9AZ, SV8WO 21, VP8s 1EK 1SD (195), 2DN 2GE 4LL 4WL 5BD 5SC 6BS (198), 6FR 6GT 7NK 7NN 7NX, YS1RA, ZC4JA, ZDs 1SW 18-19, 4BK, ZPs 2CH 5CF 5GM 51B (420) 22, 5IM, 4X4s CX DK and 5A2CO are 15-meter radiotelephones spotted by NNRC's sharp ears.

**40 c.w.** gives a reasonable account of itself right through the thunderous season. K6EC recorded contacts with GR7s C1 (16) 6, CN (5) 6, several LUs, JZ0DN (10) 14, ZD6BX (17) 16 and ZE3JP (18) 7. Shipboard ops 8Ms 3AQD 6CWC and 7B1J paid Ev a personal visit when their *SMS Aelssnaben* dropped anchor in San Diego. . . . . VQ2EW, ZE2JC, ZS7D and 4S7NG broke through the W/K barrage to QSO ZD6BX on 40. . . . . 7-Mc. doings here and there, at K2HZZ: FASDA, TI2WR, XE1MJ, K2JCK: KG4AJ, KV4BK, VP7NM, YU1DYZ, W3TTH: LU1AP, ZE3, W5CAF: DU7SV and others. K6ID1: one CX1ADF (4) 2-3, W01BS: many VKs ZLS, CE7ZJ (5), LU8, W7AMA: YJ1DL (8), KL7BBV: FO8AL on Tubuai.

This is the slack season for 28- and 3.5-Mc. work but W2QHH reports catching VK9RH on 80 for his No. 113 on the band. . . . . NNRC constituents logged GT1PK, CX2CL, DJ2KG, DLs 4DS 6VM, EA7DI, FSPQ, I1THP, JA1s AGU AI, KZ5s galore, LUs likewise, OE1FF, PJ2s AC AP, TI3LA, VP8s 7NJ 9AY and 4X4DK sneaking through on 10 'phone during brief openings. . . . . Forty 'phone produced NNRC SWL cards en route VK2s AFC, AFF AIO ALL AQ AQF AVV JN LF LF LP CA SF WA, VK3s AAO ABI ALA AOA ASD ASF HK QP XI, VK4s AI AO AR BW CP DJ FT HD JR LL MO PR QR TK TS WI WR Y1 ZB ZM, VK5s JO NM RR SU, JA1s AGU AI ALR and JS, Fortv A3 has large crews performing Down Under and Up Over but the two groups seem to have an awful time getting together!

## Where:

W1WY receives assurance from ex-VK1AC, now VK3IB, that all VK1AC Macquarie QSOs will be confirmed. Chas. has been setting up housekeeping at the QTH to follow—patience, please. . . . . W4BRB wants it understood that at present he handles QSLs for no DX stations, despite recent rumors to the contrary. "When I do so I will advise in advance and in the legitimate manner." As we phrase these lines there are about six highly unusual call signs being bruited about on DX bands. Until somebody sees the color of their QSLs there's little logic in wasting much speculative space on them because there is already on hand a surfeit of solid, albeit less sensational, DX information to





An HT-9 rig and SX-71 inhaler are the nucleus of the layout with which KC6ZB passes out Yap Island QSOs on 14-Mc. 'phone. Ralph is on 20 almost daily and throws a stout signal Stardward with either a 3-element rotary beam or Vee array. (Photo via KC6AA)

disseminate. Suffice it to say that W6GAL, W3GRF, W4QV and W4BRB can't help you out with YA6GAL, 4W1AR, HJ8EW and PX1AA-4W1AB, respectively. . . . Reference the QSL-VP7NX-via-W8RVM squib in our May effort, ex-W8RVM (now W4FIQ) points out that this is true only for about 300 QSOs dating between July, 1953, through January, '54. For obscure purposes of bookkeeping long incomprehensible to Jeeves, certain licensing authorities deem it necessary to issue almost immediately a given call sign to successively different holders. In view of the importance of amateur radio's QSL tradition it should be obvious that such switching of call signs easily makes for confusion and the possible besmirching of innocent reputations. Two years doesn't seem an unreasonable length of time for a second-hand call sign to lie in abeyance while time dissociates it from the identity of its last previous owner. . . . W4QCW recommends that those still sly ZC7DO pasteboards reapply to G4CP. . . .

Stamped self-addressed envelopes are required if you accept the offers of W4ML and W5BNO to assist with FY7YE and VQ6LQ QSL matters, respectively. W5BNO's VQ6LQ logs date no earlier than May 1st of this year. . . . W6OUN earns a vote of thanks for turning out QSL stock for HK0AL, VQ6LQ, ZD6BX, YN4CB and others. Bill's homemade photo-process products are expediting rare confirmations for hundreds. . . . W6SYG, handling current QSL matters for VR6AC, will use bureau paths unless applications are accompanied by s.s.a. envelopes. . . . IIBNU of Trieste advises that the last published listing of Trieste *Call Book* addresses should be consulted while Italian licensing revisions are being completed. Likewise, then, for stations in Sardinia and Italy proper. . . . From HZ1AB: "Our QSL situation has been alleviated by the use of one of the Mimeograph machines on the base. . . . We are all caught up now and are QSLing exclusively through the bureaus. As soon as things slow down a bit, cards will be sent direct." Incidentally, HZ1AB makes use of U. S. postage. Operator W6CRV awaits reassignment and probably will draw a post in Europe. . . . For scaring up the following individual items, all hail W1s OIG OJR RDV TYQ UED VG WAI WPO WPR WY ZDP, W2BVS, W3WPG, W4s TFB YZC, W5FXN, W6s NJU UED ZZ, K6DVB, W8KAK, W9CFT, W9s CPM VFM, DL4ZC, KL7BBV, ZD6BX, NCDXC, NNRC, SCDXC and WGDXC:

AC5SQ (QSL via VU2JP) . . . . CE7ZJ (QSL via RCC) . . . . CR6AJ, A. dos Santos, P.O. Box 244, Nova Lisboa, Angola . . . . CR7CI, A. L. Figueiredo, Aeroporto DETA, P.O. Box 276, Lourenco Marques, Mozambique . . . . CR7DK, Post Box 29, Mutarara (Beira), Mozambique . . . . CX2CF, P. R. Pomeroy, Juan M. Perez 6027, Montevideo, Uruguay . . . . CX7CO, D. S. Arroqui, Ramon Anador 3108, Apzo, Montevideo, Uruguay . . . . DU7SV, V. Sotio, National Radio School, Cebu City, Philippines . . . . EA9DP, A. Perez Real, Box 213, Mellila, Spanish Morocco . . . . EL2C, % PAA, Roberts Field, Liberia (or via W1QJ) . . . . EL2P, Les Hibbert, PAA, Roberts Field, Liberia . . . . ex-ET3S, VE3RE, Box 320, Waterford, Ontario, Canada . . . . IHBs GW IV MO (QSL via USKA) . . . . HPIEH, Louis Decatrel, Box 189, Panama City, Panama . . . . IIR3HII, H. J. Holler, % Standard Fruit Co., Coyoles, Honduras . . . . IIBNU, F. de Gironcoli, via F. Venezian 5, Trieste . . . . ICWZ, Mario Giganti, Viale Regina Margherita 30, Milan, Italy . . . . JA1ATF (QSL via JARL) . . . . JZ9PS, Box 52, Hollandia, Netherlands New Guinea . . . . KA2KS, Box 31, Navy 830, FPO, San Francisco, Calif. . . . . KC6DC, Duane E. Clymer,

Koror, Western Caroline Islands . . . . KC6EE, Elmer E. Comstock, USCG Depot, Box 1, FPO 926, San Francisco, Calif. . . . . KC6SP, USCG LORSTA Anguar, USCG Depot, Box 1, FPO 926, San Francisco, Calif. . . . . KGIBO, BMS 6607, AB Wing, APO 23, New York, N. Y. . . . . KG1FR, 2004th AACs Sqn., APO 121, New York, N. Y. . . . . KG1JB, J. Barrett (W4KVM), % 1935th AACs Sqn., APO 858, New York, N. Y. . . . . KJ6BG, Warren D. Kirk, Box 441, APO 105, San Francisco, Calif. . . . . KL7BBY, F. Templin, Box 333, APO 912, Seattle, Wash. . . . . ex-KS4AW, W. F. Hancock, P.O. Box 26, Opalocka, Fla. . . . . KX6BL, L. H. Wells, APO 821, San Francisco, Calif. . . . . KX6BM, L. C. Kelsey, APO 824, San Francisco, Calif. . . . . LU8ZS, J. P. Sorochar, Destacamento Naval Luna, Islas Shetland del Sur, South Shetland Islands . . . . MP4NL, Box 40, Bahrain Island, Persian Gulf . . . . ex-MP4QAJ, R. Rimmer, G3KCE, 29 Kirkless Rd., Southport, Lancs., England . . . . OQ5PU, Box 1945, Elizabethville, Belgian Congo . . . . OX3UD, Angmagssauk, Greenland . . . . SV0WT, V. T. Sparacine, 7954th Army Unit, JUSMAGG, APO 206, New York, N. Y. . . . . TF2WAH, 932nd AC&W Sqn., APO 81, New York, N. Y. . . . . UA4KPA, Box 74, Odessa, Ukraine, U.S.S.R. . . . . ex-VK1AC, VK3IB, 75 Lloyd St., Dinuboola, Vic., Australia . . . . ex-VK1BA, B. Fiebig, 48 Blackburn St., Maddington, W.A., Australia . . . . VP6AG, A.D.A. Cottingham, Tara, Garden Gap, Worthing, Ch., Barbados . . . . VP6AG, A. G. Street, Bloomsbury, St. Thomas, Barbados . . . . VP6BG, F. Lashley, Retreat, Gun Hill, St. George, Barbados . . . . VP6BO, Jeanne M. Sugars, Chelthelme, Chelsea Gardens, St. Michael, Barbados . . . . VP6PG, P. G. Wallbridge, Ladymeade Gardens, St. Michael, Barbados . . . . VP6WR, W. A. Richardson, Wendmar, Flinthall, St. Michael, Barbados . . . . ex-VQ3EO, P. Stein, % Macalder Nyanza Mines, Private Bag, Kisumu, Kenya . . . . VQ5EL, Box 69, Kampala, Uganda . . . . VQ5FS (E19G) Box 118, Jinja, Uganda . . . . VQ6LQ (QSL via W5BNO—see preceding text) . . . . VQ8AG, Frank McLaughran, 180 Route Royale, Beau Bassin, Mauritius . . . . VR6AC (QSL via W6SYG—see preceding text) . . . . VS1AD, E. C. Yates, P.O. Box 564, Singapore, Malaya . . . . ex-VS1BQ (QSL to DL2TH) . . . . VS1EW, P.O. Box 158, Singapore, Malaya . . . . ex-VS5KU (QSL to G2KU) . . . . VU2CY, Colin Young, P.O. Box 150, Calcutta, India . . . . YU2IP, Jelencic, U1. Rade Koncara 183, Zagreb V, Yugoslavia . . . . YY9AP (QSL to YV5AP) . . . . ZC2PJ, P. J. Reeves, Direction Island, Cocos-Keeling Group, Indian Ocean (QSL via MARTS) . . . . ZD6RM, R. MacFarlane (GM3EAK), % Postmaster, Blantyre, Nyasaland . . . . ZS1PD/ZS8 (QSL to ZS1PD) . . . . 5A4TZ, P.O. Box 372, Tripoli, Libya.

## Whence:

Asia—AC5SQ puts virgin ARRL DXCC Countries List territory on the air after a move of 70 miles from his AC3SQ shack. This from VS1CZ via W6YY—how rare can a guy get? . . . . Further Asia gleanings courtesy W6YY: The first few weeks of BV1US (Formosa) activity produced over a thousand contacts with 50 countries. . . . A handy marker station for 20-meter breakthroughs to Asia is Hong Kong Cable & Wireless on 14.283 kc.; a female voice usually modulates. . . . VS2DQ, long a reliable source of Far East info, isn't expected back from Europe till next year. . . . Reminder: KAs must turn down 3rd-party traffic as of early June. . . . From W1s BDI RGY and others we're glad to hear that ex-AC4RF finally pierced the bamboo curtain. Bob had been imprisoned by Chinese Reds since the fall of Tibet in 1950. . . . W1UED advises that would-be Ham Vajapeyam Shankar Marayan Sri Nrusimha Vivas, No. D.84/839, 3rd Crossroad, Srirampuram, Bangalore 3, South India, desires correspondence with U. S. amateurs. . . . JA1ATF, probably the dean of Japanese amateurs, operated under prewar call signs J2PS, J7CG, MX3II and AC4TF. . . . Those seeking more DX-award wallpaper should write JA1UY with reference to a certificate offered by the Sugimani Radio Club of Tokyo. So advises K6DV via W1QON. . . . W6CRV of HZ1AB says incoming s.s.b. signals cut 20-meter QRM like a hot knife through butter but he has difficulty getting the local talent to tune for it properly. . . . In an interview with WGDXC newshawks VS2DW reports that a DX-station operator's pet dreams are WAS and a 60-QSOs-per-hour Test average. [How about an automatic QSL machine, Boss? A gadget that checks the log, prints the cards, makes them out, stamps them (free), signs them and mails them via rocket express!—Jeeves.] VS21DW keeps in touch with his 14-Mc. public by way of a modified BC-610E, HRO-M and dipole.

Africa—"I wish to inform you that I am going to Basutoland during August this year. I will be operating on 7 and 14 Mc. from about the 8th to 29th under the call sign ZS1P1/ZS8. I tried very hard to get a ZS8 call but was refused. The operating times will be approximately as follows: 7 Mc. from 2200 to 0600 GMT with a two- or three-hour break for sleep; 14 Mc. from 0800 to 1930 GMT. I will operate c.w. only, using 50 watts to 807s with ground-

plane antennas on both bands." This from ZS1PD who has accumulated some 103 countries at his Strand home station . . . . . ZD6BX reports that ZD6RM (GM3EAK) is helping to pass out Nyassaland QSOs with a will. "ZD6EF also is going strong with an 813 and long-wire on 14 and 21 Mc. He has clamp-tube modulated 'phone. . . . I am toying with the idea of a trip to the Aldabra Islands but obstacles are terrific! I could manage two weeks' leave for the project and I have suitable gear but the big thing is getting there, I'll do my best!" Vic closes in on the 100-confirmed mark and reports good results feeding each of his ground-planes with two sections of paralleled 75-ohm coax . . . . . ZS6VA is receiving QSLs from some unfortunate individuals who worked an n.g. ZS6VA out KH6-W6 way. —ZS1IR . . . . . WGDXC Africanograms: SV0WK departed from Greece to try ham conditions in Egypt. . . . EL2X visited Stateside and may become a W2 or K2. . . . CN8MM mentions the activity of FB8AM on Amsterdam Isle. . . . VQ5FS expects to be active in Uganda for several years and has a sharp collinear array focused on his native Eire (one way to minimize W/K interference!).

**Oceania** — W6YY's voluminous Oceanic notes make interesting excerpt: ZC2PJ writes, "Regret I'm only transient here. Returning to Ceylon in August. Hope to see you from 487 [with my 75-watt 807s rig]. Hope my relief here will take a rig so that ZC2 is still on the air. Haven't heard any ZC3s in a long time." . . . VR6AC, located on the northeast coast of Pitcairn with a 1000-foot mountain reflector behind him, expects to be active several times weekly for North American contacts. When not on the air he charges his batteries anew. . . . VS1CT closed down VS5CT in late May after 912 Brunei QSOs that included contacts with 28 states. After a few Sarawak months he'll probably return to Brunei or try his hand at ZC5 work. . . . The freshly available WIA (Australia) WAWKCA award is based on obtaining 21 QSLs, these to include one from any VK1, one from any VK9, one from Northern Territory (VK5 prefix), and three each from VK2 VK3 VK4 VK5 (South Australia), VK6 and VK7. Write WIA at Box 2611W, CPO, Melbourne C1, for full details before applying. Finding one of those Northern Territory VK5s should keep you busy for awhile! . . . Norfolk's VK9RH usually lists his DX on week ends from 0400 to 0600 GMT, 40 and 20 . . . . In the 1954 VK/ZL Test ZL1AH and VK2GV copied c.w. holders; ZL1MQ and VK2AHH cleaned up on 'phone. Peak scorers for their respective U. S. call areas were Ws IRWP 2WZ 3VKD 4KXV 5HVR 6MVQ 7PQE SJIN 9ABA and 6RSL. W6YY topped the North American field on voice. The 1955 VK/ZL affair is coming fast upon us, incidentally, October's the month! . . . .

W7HNG, we learn from W1WPO, was VR6AC's first A3 QSO since prewar days. VR6s AW and AY, though still on the island, remain inactive hamwise. VR6AC had difficulties in getting out until he tried W6MUR's suggestion and cut off some flat-top. . . . Ham and tropical paradise at KC6AA of Yap Isle: Viking I, SX-88, HQ-140X, 75A-3, and two long-wires 90 feet high, one of which is 1200 feet long and traverses a lagoon overlooked by the shack . . . . VK31B, ex-VK1AC, toils at Victoria b.c. station 3SH when not working on his Macquarie QSL backlog . . . . VR2BZ retired from RNZAF duties and no longer traipses over to the Tokelau area.

**Europe** — EDR (Denmark) has modified its OZ-CCA award rules so that amateurs outside Scandinavia won't find it such an impossible nut to crack. Write the society's Traffic Department, Diploma Section, P.O. Box 335, Aalborg, for the revised specs . . . . Early this month HB1s IV and MO (c.w.) and HB1GW ('phone) will fire up on 5000-foot Mt. Rigi, Schwyz canton, on 80, 40, 20, 15 and 2 meters. "We would be glad to meet many American stations and will listen and call each evening beginning 2100 GMT." Their climb is sponsored by the Lucerne section of USKA . . . . Attention is called to the Swiss S.W. Service's amateur DX programs broadcast by beam to North America on 6165, 9535 and 11,865 kc. each first Friday (Thursday night in U. S. A.) of every month at 0150 and 0435 GMT. HB9s CZ GI and HE9RDX are emcees . . . . Dates specified last month for the DARC (Germany) WAEDC contest are valid. This world-wide DX test is the postwar version of the old DJDC affairs and should be a real whingding. Make plans now to be around the shack from 0000 to 2400 GMT September 17th-18th (c.w.) and 24th-25th ('phone) — details next month. The



A stream of W/K/VE/VO contacts and a good share of rarer DX entities keeps coming back to CR7DK's Bandmaster. The Hallcrafters receiver sorts out the many customers who queue up on several bands for Fernand's Mozambique confirmations.

shrewd heads will get up fixed arrays for Europe because a 3-element beam will be just another antenna in this competition! . . . . From 11CWZ: "There now are very few hams in Italy because of the new regulations issued last year. All Italian hams have had to sit for examinations on theory and c.w. in order to get their old ham licenses renewed. So far the number of new licenses is around 200; before the regulations changes there were 4000 hams in Italy." Mario intersperses his own DX work on 80 through 10 meters with frequent 2-meter sorties and has a neat low-power 91/80 DX record . . . . Via KN2KHZ: OH1s RX SS and others put the Aaland Islands on the air in late May with a 200-watt 813 on 3.5 and 14 Mc, using ground-plane and Vee antennas. U. S. contacts numbered 70 out of a 274-QSO total, all contacts save one being on c.w. The Aalands make up the rarest of Finland's ten departments (states) so their QSLs will be welcomed additions to many collections . . . . SRAL (Finland) seeks inspiration along the line of a receiver for their hq. station. Those with pregnant ideas can drop OH2RY lines . . . . G3JFD, via NNRC's *Official Bulletin*, clarifies British call-sign arrangements. "Firstly, no distinction is made between the various prefixes of the British Isles (G GC GD GI GM GW), which means that if there is a G3AAA, no other British prefix can be followed by "3AAA" unless G3AAA moves to another area. Secondly, the numbers in British call signs have no territorial significance whatever." G1 G7 and G9 calls are special used by experimental stations of various kinds. The GB prefix is reserved for use by exhibition stations and the like. Only the prefixes G2 and G3 at present are followed by three letters, these being call signs issued since 1945.

**South America** — From South Shetlander VP8A: "There will only be four VP8 stations active from Antarctica this coming year. They are VP8BI who will be operating from Grahamland, VP8s AQ BF and BH who will be operating from the South Shetlands. There is a faint possibility that a VP8 will be active from my old location in South Orkney Islands but the call is not known at the moment. The VP8 stations who were active from Antarctica during 1954 — VP8s AA AO AX and AZ — already have, or will have in the near future, returned to England."

. . . . . W2BVS finds that CX7CO tunes the U. S. Novice

(Continued on page 126)



"There he is. . . . No, it's someone calling him. . . . What a pile-up! . . . Wait — he's coming back — got him!" CX2CF is shown here participating in the rapidly reviving sport of 10-meter DX chasing. Peter has a 4-250 final modulated by Class AB<sub>1</sub> 4-125s, and receives with an RME-45.



# Operating News



F. E. HANDY, WIBDI, Communications Mgr.  
R. L. WHITE, W1WPO, Asst. Comm. Mgr., C.W.  
PHIL SIMMONS, W1ZDP, Communications Asst.

GEORGE HART, WINJM, Natl. Emerg. Coördinator  
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., 'Phone  
LILLIAN M. SALTER, W1ZJE, Administrative Aide

**A Test for Handling Overseas Traffic.** Regulations prohibit the handling of communications on behalf of third parties *internationally* by amateur radio, except where special arrangements have been made between nations. Chapter 9 of the ARRL *License Manual* details this prohibition (Article 42 of the Atlantic City documents). Our operating booklet likewise mentions the restriction in the section on handling messages. Third-party traffic under certain treaty provisions and limitations is authorized between the United States and Canada, Chile, Cuba, Ecuador, Liberia and Peru. Traffic may be freely handled with outlying U. S. territories and possessions wherever amateurs are licensed by the FCC, as well as with the Canal Zone. *Message traffic for U. S. military personnel overseas is permitted only with amateur stations identified by properly authorized call signs having a one or two letter prefix beginning with a W or K.*

Traffic of an unofficial nature that comes via MARS or on a military instead of an amateur frequency is sometimes re-originated or re-filed for handling within the U. S. A. as an amateur radiogram. Since Germany has been returned to the ranks of sovereign nations Article 42 is again applicable and traffic on amateur bands may *not* be handled directly with DLs, though such MARS re-files are perfectly legitimate. The form or procedure for such re-files is detailed on page 130, June 1953 *QST*.

**Limitations Requested on Japanese Traffic.** The Far East Auxiliary Radio League is the organization of the KAs in Japan. Pointing out that their request does not concern MARS programs or amateur operation in other than their region, the FEARL has requested KAs and those they work voluntarily to limit third-party traffic to personal problems such as arrival and departure messages, family illness, deaths, assisting dependents getting ready to go overseas, etc., and to carry out a reduction in third-party traffic of all kinds. The removal of any essential traffic in KA-land from their amateur 'phone bands to either MARS (military) frequencies or c.w. transmission and limitation of all 'phone patches to cases of actual need is urged by the FEARL. Important matters of finance or personal business they point out should be filed by commercial service both to give privacy and assured guaranteed delivery. It is also requested that any unnecessary greeting, etc., messages that unduly expand the volume of work be curtailed. From the data released by FEARL it appears that quite probably in view of Japan's resumption of licens-

ing (sovereignty) the JARL and commercials operating under Japanese license have objected to the essential character of some of the communications, doubtless in the light of the conflict with treaty provisions (Art. 42) as above mentioned.

**P.A.R.E.C.** The letters stand for Portable Amateur Radio Equipment Contest and recall to mind the famous Miles Per Watt contest of the Twenties. (u8GZ using '01A's and 199's won the Jewell Contest; on 40 meters in Jan. and Feb. '26 he worked oa6N and oz2XA with inputs of 1/2 watt, something to try on VKs today!) The Field Day challenges our ability to "make under 30 watts count" but stand-by radio provisions for civil defense are far from fulfilled in the light weight, low-power equipment categories. The need for amateur hand-carried and mobile equipment, packaged for results with minimum weight, is therefore a measured objective in its own right by anybody's say so. So here's the background on how you can submit some equipment descriptions to a specialist group offering you certificates for your accomplishment in this constructional field.

To increase interest in, and encourage development of Low Power and portable equipment by radio amateurs, the *QRP Society*, an RSGB group, is running a constructional competition not to close until September 30, 1955 known as their Portable Amateur Radio Equipment Contest. This is open to all licensed amateurs and SWLs throughout the world either as individuals or in club teams. Any number of entries may be submitted, though the equipment itself is not to be shipped overseas. The *QRP Society* will give certificates for overseas entry descriptions adjudged best with its contest divided into four equipment-classes.

**Class A** — For hand carried portable receivers (up to 3 pounds), transmitters up to 5 pounds and transceivers up to 7 pounds. Must be dry battery operated, weights exclusive of batteries, phones, key, antenna. Economy of battery consumption, lightness, compactness, versatility and ease of operation will be considered.

**Class B** — For mobile transmitters, receivers or transceivers up to 10 pounds maximum weight, exclusive of batteries but *inclusive* of vibrator unit as necessary.

**Class C** — For transistor sets up to 2 pounds weight exclusive of auxiliary equipment.

**Class D** — For portable *test gear* of any type such as wave-meters, signal generators, etc. All must be amateur built, battery operated and truly portable.

A special certificate will be issued by the *QRP Society* to the *best three* American entries in each class. Submit entries before September 30, 1955 to J. Whitehead (Hon. Secy. *QRP Society*), 92



Rydens Avenue, Walton-on-Thames, Surrey, England. On page one of your entry give name, call and address of sender and name the equipment described. On page two give circuit diagram and components list. Show on page three layout sketches and photographs and on further pages give a detailed description of the gear, covering theoretical, constructional and operating aspects. Drop ARRL a QSL telling us the equipment you are reporting to the QRP Society, or an extra carbon if you can spare it. We're interested.

**DX Club Sets High Operating Standards.** The "Southern California DXER Award" is to be an engraved plaque, presented annually "for outstanding performance and meritorious achievement in amateur radio DX work among Southern California amateur radio operators." W6MUR explains that the first presentation by the Southern California DX Club will be at the joint DX clubs' meeting in Fresno in January, 1956. Nominations will be received by the club in the period November 1st to December 15th. The club stresses that the Southern California amateur who is the winning candidate does not necessarily have to be a member of the club. A club committee will be charged with weighing some of the following factors in making a choice for the plaque award. In the following, readers we think, will approve of the importance SCDXC has given in its listings of factors to the promotion of DX success in terms of positive operating courtesy and ability, with initiative in club work as well as in operating. The last item (k) spells out that the man with most power and ruthlessness does *not* necessarily win! The group considering the nominations and results for the year 1955 according to this may consider DX results obtained contrasted to the capabilities of the station. *How well an amateur performs with what he has*, if given an appropriate weighing by the award group, could give a Southern California amateur in the lower power category a chance at this one! Here are the items for objective rating of all possible candidates:

- (a) Operating ethics and courtesy.
- (b) Station quality.
- (c) Signal quality.
- (d) Observance of FCC regulations.
- (e) Contributions to Southern California DX: participation in club activities, contests and functions; attendance at club meetings; bulletin contributions, technical contributions and similar factors.
- (f) Contributions to amateur radio: helping new amateurs, or foreign amateurs in any way through expedition traffic, loans or gifts of parts or equipment, handling or supplying QSL cards, assistance with technical problems, etc.
- (g) Attitude toward fellow amateurs.
- (h) Attitude toward the public, including neighbors.
- (i) Perseverance; effort in listening for new countries; in obtaining missing QSL cards; in striving for DX goals of various sorts such as certificates or awards; in ferreting DX information.
- (j) Operating ability: copying through noise or QRM; code speed; ability to cope with confusion, etc.
- (k) Success, expressed as a qualitative ratio of DX worked to capabilities of station—how well an amateur performs with what he has.
- (l) (m) Other factors considered applicable.

—F. E. H.

## WIAW OPERATING NOTE

A slight change has been made in the WIAW General-Contact schedule effective June 1st (see page 70, May QST). The station will no longer listen for Novices after the midnight (EDST) bulletins on 3555 kc. Tuesday and 7125 kc. Friday. Instead, WIAW will listen for Novices after the midnight (EDST) bulletins on 3555 kc. Wednesday and 7125 kc. Saturday (A.M.). The lithographed WIAW schedule now available on request shows this change.

The WIAW operating schedule (page 74, July QST) is still in effect.

## BRIEF

In the Novice Round-up Results (May QST), the call of the Santa Clara Valley leader should have been shown as KN6EMO. In addition, information brought to our attention reveals that KN2IBH, not KN2ICU, was the rightful winner in N.Y.C.-L.I. section.

## BRASS POUNDERS LEAGUE

Winners of BPL certificates for May traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3WTQ	55	1271	1350	81	2757
W7BA	15	780	753	26	1574
W3CUL	111	721	352	365	1349
W9BDR	5	767	734	24	1530
W9DO	8	706	678	36	1428
W3WG	23	690	664	0	1377
W0CPL	11	651	582	69	1313
W0SCA	6	640	623	2	1271
W7PXY	39	619	580	39	1267
W8ZZZ	251	390	3	3	1029
W5DTA	35	461	483	20	999
W4COI	32	458	471	12	973
W7VAZ	10	428	406	22	866
W9YWL	32	390	413	20	855
W4PEC	6	408	390	15	819
W4PL	2	409	386	16	813
W4CHA	209	339	249	12	809
K4AKP	12	373	346	25	756
W4BLR	24	362	304	53	743
W0PZO	1	355	349	5	710
W9TTL	4	387	316	7	707
W3WV	30	342	215	51	688
W9HDA	253	199	158	7	617
W7FRI	3	285	178	103	569
W4OCG	4	288	269	3	561
W0GAR	0	274	273	1	548
W9CXY	4	272	234	37	547
W4PHC	10	261	220	41	532
K6EIT	42	190	271	27	530
W5KPB	3	260	243	18	523
W1EMG	2	271	201	45	519
W1CRW	11	248	239	7	505
W3WUE	3	289	190	23	505

Late Report:

W3WG (April)	18	330	313	0	661
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## More Than-One-Operator Stations

W6IAB	53	1602	1352	250	3257
K4WAR	987	558	546	12	2103
K5FEF	72	956	992	32	2052
K1H6AJF	761	582	424	128	1895
K5WSP	213	398	607	7	1222
K1WAB	40	530	500	19	1089
K5EFA	42	432	404	28	906
KA2GE	137	355	310	48	850
W6YDK	23	401	345	56	825
KA2MA	344	234	206	28	812
K3WBJ	36	244	246	34	560
KA2AK	134	202	184	41	558
K4FDC	127	205	185	20	537

Late Reports:

KA2GE (April)	122	442	406	36	1006
K1WAB (April)	28	315	598	12	953
K4WAR (April)	92	267	318	41	718

BPL for 100 or more *originations-plus deliveries*:

W4WOX	192	W2HKA	120	W4KKW	103
W4HDR	180	W9FFC	115	W1LYL	102
W5PHA	172	W5UBW	116	W0NXY	102
W4DDY	155	KA2HQ	115	W4BWR	100
W5IWI	121	W6USY	114	Late Reports:	
W4WVE	127	W9SAA	110	W7WUG (April)	158
W1BTV	124	W2CNM	103	W3CVE (April)	125

## More Than-One-Operator Stations

K5FEF	166	KR6KS	130
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BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: W4DRD

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies, within 48 hours of receipt, in standard ARRL form.



## APRIL 30TH RACES TEST

We use the above title with reservations. There seems to have been some question as to whether this was a RACES test or an "Amateur Test of RACES Potential." The latter is probably a better description of it, but it's too long for a title. Actually, the test included AREC organizations in all stages of RACES preparation as well as those already RACES-authorized in FCDA Region I.

A bit of background will be pertinent. As long ago as last October, FCDA by official letter requested ARRL to assist in conducting a test of RACES facilities and potential in one of its regions, to serve as a monitor or "sounding board," if you will, for the nationwide Operation Alert test to be conducted in June. Naturally, we agreed to do so and alerted our ECs in Region I by special bulletin. A preliminary meeting was held in West Hartford in early February to discuss plans with representatives of FCDA and others. In late March, a meeting of all state e.d. radio officers and all ARRL SECs in the region was held in New York to finalize plans. It was at this meeting that the decision was made to include all amateurs working in civil defense, whether they were finally authorized for RACES or not. Only in this way would an accurate idea of RACES *potential* be obtained.

As it turned out, not all RACES authorized groups participated — or if they did, they didn't tell us about it. We ran two surveys, one before the test on the basis of those who expected to participate, and one after the test on the basis of those who actually did so. Let's compare them briefly.

A total of 122 ECs made preliminary reports on their potential for the April 30th Test. Of these, only 48 reported actual results; however, 49 *additional* ECs, who did not make preliminary reports, also reported results, making a total of 97 ECs who *did* report results. Compared to the 122 preliminary, this is a mighty good percentage. To be statistically accurate, however, the percentage of participants compared to the number who expected to participate was 39.3%.

A comparison of expected with actual participation can best be summarized in the following table:

Item	Expected	Actual
Fixed Control Stations	664	216
AREC members participating	1319	671
Total operators participating	2019	873
Mobiles (total)	802	233
on 75 80 meters	42	11
on 10 meters	440	144
on 6 meters	20	18
on 2 meters	301	79
Hand-carried portables	141	22

No comment is needed on the above data. They speak for themselves. Naturally, they reflect only reports received. We have no notion of how many groups who said they intended to participate actually did so but didn't report it — or how many expected to and did take part but didn't report either time. These are just some of the imponderables about this business.

A brief rundown on statistical results of the April 30th Test and we'll be done with them. There were 671 AREC registrants participating, 89 non-amateur operators and 113 non-AREC amateurs assisting. Stations used consisted of 216 fixed control stations, 236 other fixed stations and 233 mobiles. Most of the mobiles (62%) operated on ten meters, with two meters, six meters and 75 meters following in that order. Forty-three ECs reported that CD officials were present at the test, 36 that they were not; the rest did not say. Twenty-five ECs rated non-RACES CD cooperation as excellent, fifteen as good, seven as fair, five as poor, two as "lousy" and fourteen said cooperation was non-existent.

Eastern Massachusetts section ECs contributed the greatest number of reports on the test (18), with Connecticut second (12), Eastern New York third (11) and Western New York fourth (10). Western New York had the greatest number of participating operators (192), with Eastern New York second (159) and New York City-Long Island third (132). In mobiles, Western New York was high with 65, New York City-Long Island second with 41, and Eastern New York third with 32.

The test started at 1530 and lasted until 2130 EST, in order to get the best possible cross-section of band conditions during daylight, twilight and total darkness. Many of

the participating groups kept active the whole period, changing "shifts" every two hours in order to get a better picture of operating requirements in the real thing. Circuits were kept heavily loaded with "canned" messages in order closely to simulate actual emergency operating conditions.

FCDA sent Jim MacGregor, WSDUA, into Region I to observe the test first hand. Jim visited the New York State control center in New York City, then in the company of New York State RACES Radio Officer W2BGO, he journeyed into Connecticut for a visit to Connecticut installations and ARRL Headquarters.

Our count of ECs in FCDA Region I is 440. Ninety-seven reporting results is 22%. This is about what can be expected — in fact, it's better than most of our previous reporting records; which isn't the same as saying it is *good*.

The record does not do justice to the performance of the Rhode Island gang, as reported by SEC W1TQW. Twenty recently-appointed ECs activated communications networks in 16 major cities and towns throughout the state, with 200 amateurs responding to the call — about one third of all the amateurs in the state. Each of the 16 nets, consisting of a control station controlling a mobile net, maintained contact with a two-meter substation operating at state level. Traffic originated in any locality would be picked up by a mobile, transmitted to his control, passed to the state station and relayed into state headquarters in jig time. A total of 307 messages were routed to state control in Situate by this method.

Termed a success in glowing phrases in Rhode Island, the April 30th Test was described less enthusiastically in other states in the region. The statistics show that a good showing was made in New York, as was to be expected of a well-organized state RACES establishment. Statistics fail to do justice, however, to the showing in Northern New Jersey, which was better than indicated. Connecticut maintained its standard as a pace-setter for RACES organization, although there was some misunderstanding concerning eligibility to participate which kept attendance down. This same misunderstanding occurred in Massachusetts, another well-organized state from the e.d. angle. The remaining states participated at about the expected level.

It is easy enough to be mealy-mouthed and say the test was an "overall success." Actually, whether or not it was so is a matter of individual opinion — and we have heard opinions variously from "complete flop" to "indeed a successful demonstration." Looking at it from an overall viewpoint, which probably we at headquarters are better qualified to do than most others, the test appeared to have only partially served its purpose, which was to indicate amateur radio civil defense potential. We think the potential is considerably greater than shown by test results received here.



Under the heading of "Wouldn't It Be Nice If . . ." most of our emergency net organizers and net controls would list ". . . we had clear channels for our emergency nets." We agree — it *would* be nice, and if we are going to dream, that's a good enough thing to dream about. But alas, comes the awakening and we have to face the fact that we do *not* have clear channels, and only in the direst emergency can we expect to have anything approaching them. It is common practice among many nets to request casual stations to QSY when they cause QRN to a net drill, simulated emergency test or any other AREC or RACES activity. Some of them move gladly (often only to run into another net), some reluctantly with mutterings or sarcasm, and a few stand on their rights and downright refuse to budge. All who are asked to move, even those few who might agree that what you are doing is more important than what they are doing, experience at least a slight twinge of irritation.

The average amateur will, when he realizes that he is interfering in a net drill, move off of his own accord, or QRT until the drill is over, *without* being asked. Those who do not do so are usually the type who would not do so

◆ This is the communications section of the Glencoe Mutual Aid Area auxiliary control center at Strathburn, Ont. VE3WY is Coördinator for civil defense in this area, and sent us the picture, which he has plainly labeled. Note that No. 1 position operates on 3502 kc. c.w., No. 2 on 3675 kc. phone and No. 3 on 3535 kc. c.w. Actually, the latter two are "receive only" positions, while the Viking at No. 1 transmits on any one of the three frequencies.



◆ even after being asked, and the only result of asking them will be creation of hard feelings, or exchange of harsh words over the air. So what have you gained?

The solution? There is none, really. Our amateur bands are crowded, and we should be glad they are, because if they were not we probably wouldn't keep them intact very long. Such being the case, we have to make the best of a situation in which not all amateurs are consciously dedicated to public service, and grin and bear it — and think of how much practice we are getting trying to copy traffic or emergency dispatches under adverse conditions.

◆ On February 25th, ice and water seepage broke an underground cable in La Crosse, Wisc., severing communications with CAA's French Island facility. W9OGT, a communicator working for CAA, went into action from his mobile, contacting W9GPU in La Crosse. W9GPU contacted W9OOL in Madison, who served as a delivery point for hourly weather sequence reports to USWB officials in Madison until the cable was repaired. North Central Airlines also benefited from this operation. As a result of this service, W9AZN, representing CAA, presented the two amateurs with certificates of appreciation.

◆ On May 6th, 1819 CST, tornadic winds, rain and hail hit Temple, Texas, wreaking much destruction and knocking out power. Members of the Temple Amateur Radio Club were alerted and assembled at the Police Station on a standby basis. Shortly thereafter, in answer to a call, the amateurs furnished a power generator for flood lamps at the scene of the major damage. This power unit was taken out of service at 2200 when the National Guard arrived with other power units. Communications were furnished from the scene of the disaster by W5PNP/m and W5VLF/m through fixed station W5CHF. Stations participating were W5s VLF SBS CHF JIB WDW WMX PNP UPO VHF/m DXD RDL DSG and TVA. This information furnished by W5VLF through W5VHF, EC from Waco who followed the storm into Temple.

— W5RRM, SEC Northern Texas

◆ On May 14th, while driving about 30 miles from Houston, W5GLS suddenly became ill. He contacted W5GVW/m on 75-meter mobile, and had them call his doctor, who advised W5GLS to get to any hospital as soon as possible. When GLS indicated the hospital he was headed for, the doctor called this hospital and made all arrangements. W5GVW/m also made arrangements for a police escort. The doctor stated that if GLS had not gotten to the hospital, he would have died. W5GVW, assisted by W5GWP, handled this emergency traffic like an old timer. — W5FEK

◆ A plane crash in Northboro, Mass., alerted the Worcester AREC group on May 26th. EC W1SPF started the ball rolling by firing up on ten meters as soon as he heard about the crash and calling W1UQW, who was talking with W1YPK in Holden. In less than two hours, nine other stations had reported in, completely without warning or notification of any kind, showing how frequently members of the Worcester AREC-RACES group guard their emergency net frequency. W1ZMM/m went to the fire depart-

ment at Northboro and was told an ambulance had already been sent to the scene of the crash. W1MHA was asked by the Marlboro Airport to locate the plane and get the name of the party or parties involved in the crash. W1ZMM/m and W1JWM/m proceeded to the scene of the crash, but police withheld the name of the crash victim, who was killed. The plane number was reported, however, to the Marlboro authorities by amateur radio. W1LQW handled the net activity and everybody cooperated 100 per cent. Others who participated include W1s EBU RCJ MEG MT BIA and PMZ. — W1SPF, EC Worcester, Mass.

◆ The Purgatoire River in Colorado went on a rampage on May 26th and gave the little town of Trinidad, Colo., a pretty hard time. Amateurs from throughout the area figured prominently in the communications work. W6NVU took the brunt of the load in Trinidad itself, with amateurs from all over the state and adjoining states helping out with the traffic, most of it welfare. Bob worked for 40 hours without a break. He was assisted by the Hi Noon Net and other stations from the general area in handling over 300 emergency messages into and out of the flooded district. K0WBB, with Mac operating from Fort Carson, was also very active in this work. Mac later took a mobile unit to Trinidad, leaving K0WBB operation to two other operators, Milt Moore and Dave Morset. Others known to have been assisting were W0s SUP PGX KQD ICR PGN K0ANZ W7SP1/0 Quentin Fuller, Tommy Clark.

◆ A missing person search at Amos, Quebec, required the assistance of amateurs in that area. The Molson Emergency Unit (a deluxe emergency trailer unit sponsored by Molson's Brewery) traveled from Montreal to Amos to participate in the search, but had to leave without its regular operator, VE2MW. Siscoe EC VE2FL contacted the driver as the unit was passing through town and offered assistance. Then he called Assistant EC VE2ADD at Amos, who agreed to alert local amateurs to assist in the search. Thus, when the unit arrived at Amos it was provided with a radio operator in the person of VE2AHV, who went with it to search headquarters, 20 miles northeast.

◆ The station in the unit went on the air at 1430 EST and was operated almost continuously by VE2AHV and VE2ADD (who arrived later) until 2330. VE2ADA was also on hand to help operate hand-carried units with the mobile unit. The search continued on June 8th and June 9th, with the following amateurs taking part in the action: VE2s AOF AVH ADI AEV OB HL AHU FL and VE3TX. The search was abandoned on June 10th at 2300.

— VE2FL, EC Siscoe, Que.

◆ Fourteen SECs reported April activities on behalf of 5228 AREC members. This includes a report from the North Texas SEC which was in written nonstatistical form. It also includes reports from old stand-bys in the following sections: Minn., Wash., Tenn., Western N. Y., N. Y. C.-L. I., Georgia, E. Fla., Ala., San Joaquin Valley, Wisc., S. Dak., Los Angeles and Oregon. Twenty-three SECs have now submitted reports in 1955. The April reporting record is equal to that of a year ago in number of reports, far exceeding it in AREC members represented.

## A.R.R.L. ACTIVITIES CALENDAR

Aug. 5th: CP Qualifying Run — W6OWP  
 Aug. 16th: CP Qualifying Run — W1AW  
 Sept. 3rd: CP Qualifying Run — W6OWP  
 Sept. 14th: CP Qualifying Run — W1AW  
 Sept. 15th: Frequency Measuring Test  
 Sept. 17th-18th: V.H.F. QSO Party  
 Oct. 7th: CP Qualifying Run — W6OWP  
 Oct. 8th-9th: Simulated Emergency Test  
 Oct. 13th: CP Qualifying Run — W1AW  
 Oct. 15th-16th: CD QSO Party (c.w.)  
 Oct. 22nd-23rd: CD QSO Party (phone)  
 Nov. 5th: CP Qualifying Run — W6OWP  
 Nov. 12th-13th, 19th-20th: Sweepstakes  
 Nov. 18th: CP Qualifying Run — W1AW  
 Dec. 2nd: CP Qualifying Run — W6OWP  
 Dec. 12th: CP Qualifying Run — W1AW

## RACES News

Operation Alert, 1955, has come and gone. RACES was active — more so, we dare say, than most branches of civil defense in most parts of the nation, generally speaking. Reports from participants are beginning to reach us. There will be a QST write-up on the amateurs' participation in this nationwide exercise, in September QST if we can make it. Its location in the magazine will of course depend on the material available. So send us photos if you want to make it "up front" material; otherwise it may be relegated to six point.



Recent conversations with people at Battle Creek (FCDA National Hq.) bring out numerous facts and opinions concerning the test, mostly a result of monitoring. One of the most glaring deficiencies noted from that level was the improper use of frequencies and technique, according to a pre-copy telephone conversation. The feeling is that not enough advantage is being taken of the use of c.w. for medium- and long-haul traffic in most areas. Instead, attempts (often futile, almost always frustrating) are being made to handle all this traffic on 75-meter 'phone.

The above comments are not ours; they come unsolicited from FCDA Headquarters, where monitoring indicated too much use of 75 'phone, not enough use of 80 c.w. for RACES operations during the drill. Also, no action was heard on the DCS frequencies of 1750-1800 kc., and only one network was observed operating in the 160-meter RACES segments. One station was heard using c.w. on 3993 kc., trying to cut through the QRX.

All things are relative, however. We are better off thinking our performance, generally speaking, was below standard (that is, below the standard we would like) than resting on our laurels, such as they are. Actually, the nation-wide RACES establishment compares most favorably with any other branch of civil defense in its participation in this test. In the few local control centers we visited, RACES facilities operated longer and harder than any other c.d. facility. Publicity was favorable. We made a good showing; but it could be a lot better. Next year it shall be.

South Dakota amateurs are getting after their state officials to start something along RACES lines. At a meeting in Mitchell on April 17th, W0GCP called the meeting to order and speakers included W0GCP (the SEC), W0RRN (the SCM) and several other ARRL and state officials. The governor has been contacted and has expressed himself in favor of organizing the amateurs for c.d. The group at Mitchell recommended the appointment of Myron Jones, W0QXC, as state radio officer. The meeting continued to discuss detailed plans for statewide organization under the AREC and RACES. Keep your eye on South Dakota.

In New York State, W2BGO reports that the RACES organization is assisting the Radiac (radiological monitoring) branch of civil defense by transmitting c.d. fallout weather reports twice a day except week-ends and holidays. They are received from the Weather Bureau in New York City by radioteletype and put on the air at 1600 and 1700. Radiological chiefs throughout the state have the radiac

people receive these reports, break them down and plot the winds aloft. It's good training in communication, meteorology and coordination combined.

Another state to keep your eye on is Kentucky. SEC W4CDA reports having attended a meeting on April 8th in which a great many state c.d. officials were included, including W4BAZ (Communications Director of 3rd Mobile Support Group) and W4MGT (Communications Director of state OCD). At this meeting, the discussion centered around establishing c.d. communications to the amateurs in a RACES network. It was decided that the state OCD will endeavor to get funds for equipment to establish such a network.

## TRAFFIC TOPICS

Every traffic net is an emergency net, and every emergency net is a traffic net. This is, or should be, axiomatic in our public service establishment among amateurs. It is something which we have urged many times, and it bears repeating.

Each of us has at one time seen an emergency net in which members seem to have no conception of how to handle traffic; and most of us have also seen traffic nets which not only have no plans for but disband operating in an emergency. Each group has something to learn from the other. Traffic handling and emergency preparedness are not dissociated subjects. For a traffic net which cannot effectively operate under emergency conditions is not much of a traffic net, and an emergency set-up which cannot effectively handle traffic will be an awful flop in an emergency.

Enough said? No, not quite. This is a traffic column, and we are here concerned principally with traffic nets. It seems to us that there are an awful lot of them in operation these days which have no plans to operate in an emergency. How about in your section? Do plans exist to activate your net, on its regular operating frequency, to handle both official and individual welfare messages at a moment's notice? If no, why not get together with your SEC to put such plans into effect?

As for the National Traffic System, plans for activating these nets for emergencies have existed right along. They were first promulgated in an Emergency and Traffic Bulletin dated "Spring, 1950." We think they will now bear repeating.

When an emergency situation arises, regardless of the time of day or night, the NTS net or nets in the affected area should be activated and ready to handle any and all emergency traffic, while NTS nets in surrounding areas should be activated to take care of outside communications if and when called upon. Depending upon the urgency involved and the volume of emergency traffic, official or otherwise, the net manager concerned has the duty of determining whether his net in any particular situation shall handle official emergency traffic only, all emergency traffic, or all traffic as usual. His decision should be complied with by all traffic handlers concerned.

The extent of NTS activation in emergencies depends entirely on the extent of the emergency. If a local flood, the section traffic net will probably be sufficient. If covering an area of several states, probably the regional net should be activated in addition to section nets, with "shuttle" liaison between them, and possible activation of the area circuit to provide outside contact. If the emergency is area-wide, all NTS nets within that area should be on the job, with possible activation of an adjacent area net to provide outside contact.

The above is policy now with the National Traffic System. We think it should be an over-all policy of traffic nets to be worked into their section-wide emergency organization. In some cases this has already been done. In those where it has not, don't you traffic men wait for your SEC to act. Offer your services and those of whatever net you represent. As a traffic man, you can do a world of good in any emergency.

Two miscellaneous traffic net reports: (1) Early Bird Net traffic count for May was 613; (2) The First Call Area section of TCPN registered 749 messages, with 12 stations participating, during May. The Second Call Area section reported 571 messages with 9 stations.

From an anonymous contributor: "Heard the following on 75 'phone: 'Say OM, I am short five or six messages in my tally for making BPL this month. Can you think up any

old thing and send it to me and I will make a message out of it so I can add to the score.'

"What in the world has happened? Have the young squirts turned BPL into a SS contest?"

**National Traffic System.** Ament the prospect of reactivating the Mountain Area Net. W0KQD has compiled some statistics to show that it "ain't easy." The Mountain Area (i.e., generally speaking the area encompassed by the MST zone) has a population of less than one third that of the Pacific Area, about a tenth of the Central Area and a fifteenth of the Eastern Area. Amateur population is roughly comparable. There would also be the necessity for twelve additional TCC schedules per week. To reactivate a Mountain Area Net, W0KQD concludes, would require a great many more ardent NTSers than now appear to be extant, at least equivalent to those in the Eastern Area with its much larger population.

Do they exist? If not, can they be created? Colorado alone is contributing more personnel to TCC than any other single state. If the entire Pacific Area produced TCC operators at the same rate as Colorado, that Area would have 75 TCC operators, Central Area would have 177 operators, and Eastern Area would have 323 operators. But an area organization cannot rest on the shoulders of one section. How about some of the other Mountain Area states? If you want a separate Mountain Area organization, you'll have to produce the operators. It was for lack of operators that MAN had to be abandoned in the first place.

May reports:

Net	Sessions	Traffic	Rate	Average	Representation
EAN	22	1076	—	49	94.7%
PAN	24	938	0.67	39.1	—
1RN	25	382	0.44	15.3	85.1
2RN	41	190	0.24	4.6	—
3RN	44	290	0.53	6.6	76.5
4RN	20	193	1.02	9.6	67.9
RN5	44	1026	0.57	23.3	69.7
RN6	34	231	—	—	—
SRN	35	100	—	3	64.8
TEN	64	1229	—	19.2	60.2
TRN	41	132	0.60	3.3	62.6
Sections *	400	2466	—	—	—
TCC (Eastern)		273	—	—	—
TCC (Pacific)		701	—	—	—
Summary	794	9227	4RN	10.4	EAN
Record	794	9433	—	22.1	—

Late reports:

4RN (Apr.)	20	101	0.16	5.1	61.4%
EAN (Apr.)	26	882	1.20	34	89.1
2RN (Apr.)	34	148	—	4.5	80.4
TEN (Apr.)	69	1790	—	26	70.3

\* Section nets reporting: GSN (Ga.); QKS, QKS-SS & QKN (Kans.); TLCN (Iowa); AENB & AENP (Ala.); CN & MCN (Conn.); WYN (West Va.); SCN & CVN (Calif.); NTX (Texas); KYN (Ky.); MSN Fone & MSN CW (Minn.).

Several section net managers have asked why their nets cannot get more than summary mention in this column. The reason is that there simply isn't room, fellows. Your SCM's activities column is the place for mention of any details of section net operation. The mention below of regional and area nets is included here because these nets are not within section boundaries; if they were, undoubtedly they also would receive no space here. But section nets are a very vital part of NTS, make no mistake about it. We would like to have data each month on your schedule, number of sessions, traffic handled and list of NCSs.

**Net notes:** 1RN conducted a special session on Saturday, May 21st, to assist the Cranston, R. I., YMCA drive, at which amateur radio was a feature. The net was active from 1300 until after 2000 that day, handled 86 messages. A 3RN certificate has been issued to W3IYC. Heavy QRN is hampering operation of 4RN, but new manager W4BVE is showing progress. RN5 is handling more traffic than ever before in its history. Much of this is due to the efforts of old-time-traffic-man W5IGW, who is QNI almost every session and on May 21st NCSd the net for six hours, clearing 204 messages. RN6 expects to have a KH6 representative soon. Many sessions of SRN were not reported in May. TRN is now operating two sessions nightly, at

1845 and 1945 EST Monday through Friday, the early session on 7070 kc. and the late one on 3535 kc. TRN certificates have been issued to VE's 1OM 1HJ 2DR 2CP 3BUR 3AVS 3TM 3AJR and 3ACU.

TCC Area Directors are having a tough time keeping their rosters full during the summer. W8UPB reports for Eastern Area that eight TCC stations made 25 reports in May, with W1EMG passing the most traffic. W6HC reports for Pacific Area that nine TCC stations reported, with W0EKQ handling the greatest amount of traffic. Harry is also desirous of relinquishing his TCC job, now that he has taken over as ARRL Director. Any takers?

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are required on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested: (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]  
38 La Salle Road, West Hartford, Conn.  
We, the undersigned full members of the .....  
..... ARRL Section of the .....  
Division, hereby nominate .....  
as candidate for Section Communications Manager for this  
Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— F. E. Handy, Communications Manager

Section	Closing Date	SCM	Present Term Ends
Yukon *	Aug. 15, 1955	W. R. Williamson	Mar. 17, 1949
West Indies	Aug. 15, 1955	William Werner	Aug. 15, 1952
Utah	Aug. 15, 1955	Floyd L. Hinshaw	Feb. 18, 1954
Colorado	Aug. 15, 1955	Karl Brueggeman	Feb. 16, 1955
Vermont	Aug. 15, 1955	Robert L. Scott	Oct. 15, 1955
South Carolina	Aug. 15, 1955	T. Hunter Wood	Oct. 15, 1955
San Diego	Aug. 15, 1955	Don Stansifer	Oct. 15, 1955
Western Florida	Aug. 15, 1955	Edward J. Collins	Oct. 15, 1955
East Bay	Aug. 15, 1955	Guy Black	Resigned
Western New York	Sept. 15, 1955	Edward Graf	Nov. 21, 1955
Eastern New York	Oct. 14, 1955	Stephen J. Neason	Dec. 14, 1955
Ohio	Oct. 14, 1955	John E. Siringir	Dec. 14, 1955
Alabama	Oct. 14, 1955	Joe A. Shannon	Dec. 14, 1955
Quebec *	Oct. 14, 1955	Gordon A. Lynn	Dec. 15, 1955
Illinois	Oct. 14, 1955	George T. Schreiber	Dec. 15, 1955
Alaska	Nov. 15, 1955	Dave A. Fulton	Jan. 15, 1956

\* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

## ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Nebraska	Floyd B. Campbell, W0CBH	April 15, 1955
Saskatchewan	Harold R. Horn, VE5HR	April 15, 1955
North Dakota	Elmer J. Gabel, W0K7Z	June 15, 1955
New York City		
Long Island	Harry J. Dannels, W2TUK	July 31, 1955
San Francisco	Walter A. Buckley, W6GGC	Aug. 14, 1955

In the New Mexico Section of the West Gulf Division, Mr. Einar H. Morterud, W5FPB, and Mr. Travis W. Andrews, W5B1H, were nominated. Mr. Morterud received 100 votes and Mr. Andrews received 69 votes. Mr. Morterud's term of office began May 4, 1955.

In the Wisconsin Section of the Central Division, Mr. Reno W. Goetsch, W9RQM, Mr. Lloyd D. Watson, W9LXA, and Mr. Elton L. Miottel, W9BVG, were nominated. Mr. Goetsch received 303 votes, Mr. Watson received 83 votes, and Mr. Miottel received 81 votes. Mr. Goetsch's term of office began May 12, 1955.

In the Maine Section of the New England Division, Mr. Allan D. Duntley, W1BPI/YA, and Mr. Carl E. Watson, W1LJA, were nominated. Mr. Duntley received 113 votes and Mr. Watson received 52 votes. Mr. Duntley's term of office began May 16, 1955.

In the South Dakota Section of the Dakota Division, Mr. Les Price, W0FLP, and Mr. John W. Sikorski, W0RRN, were nominated. Mr. Price received 75 votes and Mr. Sikorski received 61 votes. Mr. Price's term of office began July 2, 1955.

## CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from WIAW will be made on August 16th at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,010, 52,000 and 145,600 kc. The next qualifying run from W6OWP only will be transmitted on August 5th at 2100 PDST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions will be made from WIAW each evening at 2130 EDST. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy.

Date	Subject of Practice Text from June QST
Aug. 1st:	A Broadband Antenna for 75 meters, p. 11
Aug. 4th:	Parallel 6146s . . . p. 14
Aug. 9th:	Better Selectivity . . . p. 18
Aug. 12th:	Elementary TV Trouble Shooting, p. 23
Aug. 17th:	Modifications in the Viking II, p. 27
Aug. 23rd:	Board Meeting Highlights, p. 32-A
Aug. 26th:	A 5-Over-5 for 50 Mc., p. 36
Aug. 30th:	21st ARRL Sweepstakes Results, p. 48

## NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C.W.: 3550, 7100, 14,050, 21,050, 28,100.

'Phone: 3875, 7250, 14,225, 21,400, 29,640.

## DXCC NOTES

In accordance with the DXCC rules, "Confirmations from additional countries may be submitted for credit each time ten additional confirmations are available." The large number of cards currently being submitted in batches smaller than the required ten is resulting in a tremendous amount of extra work and consequent delay in handling. These can be reduced if DXCC members will adhere to this rule. Endorsements (and subsequent QST DXCC box men-

tion) are issued only when sufficient cards are submitted to increase a total from one bracket (110, 120, 130, etc.) to another. There is, therefore, no point to sending confirmations that increase a total from 135 to 137, for example. In such a case, a member may, of course, submit only five cards, to bring his total to 140.

In order that the Honor Roll listings and W/VE/VO Call Area and Continental Leader listings may be maintained from month to month, three exceptions to the rule are allowed: (1) If you already have credit for 235 or more countries (c.w./phone), or can bring your total above 235 by submitting fewer than the ten cards required by the rules, we invite you to do so. (2) If you already have credit for 200 or more countries on 'phone, or can bring your total above the 200 mark by submitting fewer than ten cards, you are similarly invited to send in the additional confirmations. (3) If a W/VE/VO can bring his total above, or tie, that of the leader in his call area, or those outside of W/VE/VO can tie, or bring their totals above the leader on their continent as shown in the DXCC box.

## DX CENTURY CLUB AWARDS

### HONOR ROLL

W1PH. . . . .258	W6SN. . . . .249	W3JTC. . . . .247
W6VFR. . . . .254	W8NBN. . . . .249	W3KTC. . . . .247
W6AM. . . . .253	W3YCK. . . . .249	W3KJN. . . . .247
W6ENV. . . . .251	W3GHD. . . . .248	W2AGW. . . . .246
W8HGW. . . . .251	W6SYG. . . . .248	W6MEK. . . . .246
W3HES. . . . .250	W2BXA. . . . .247	W6MX. . . . .246
W0YXO. . . . .250		W7AMX. . . . .244

### Radiotelephone

W3YCK. . . . .242	W1JCN. . . . .218	W8HGW. . . . .214
W6AM. . . . .230	W1MCO. . . . .216	W3KJN. . . . .212
W04ER. . . . .230	W1NWO. . . . .216	W0RBA. . . . .210
Z86BW. . . . .226	XE1AC. . . . .215	W9NDA. . . . .209

From May 15, to June 15, 1955 DXCC certificates and endorsements based on postwar contacts with 100- or more countries have been issued by the ARRL Communications Department to the amateurs listed below.

### NEW MEMBERS

H9EPT. . . . .147	KZ5DG. . . . .105	D14ZC. . . . .101
W5PZL. . . . .123	W7FB. . . . .104	G2WQ. . . . .101
W3KVB. . . . .118	H9BMO. . . . .104	ZD2DCP. . . . .101
W8OGV. . . . .117	SM3BIZ. . . . .104	W4PYD. . . . .100
W1JDE. . . . .116	W0GDI. . . . .102	W4TFB. . . . .100
W2HO. . . . .112	OE13USA. . . . .102	W5QKZ. . . . .100
EA5AF. . . . .108	OH5OP. . . . .102	W5ZCK. . . . .100
W6NDF. . . . .107		ON4HB. . . . .100

### Radiotelephone

W3KVB. . . . .116	W6CO. . . . .107	KZ5DG. . . . .101
EA6AR. . . . .109	W4EBO. . . . .104	VP6WR. . . . .101
W8RVU. . . . .108	W9WHM. . . . .102	K2CJN. . . . .100
11AHW. . . . .108	W2CGP. . . . .101	W9ABA. . . . .100

### ENDORSEMENTS

W0DAE. . . . .229	W0BQE. . . . .170	W5UG. . . . .140
W5BFL. . . . .225	ON4PA. . . . .170	W5KBU. . . . .137
W1B1H. . . . .220	W0AZT. . . . .168	W8DUS. . . . .137
W7GUV. . . . .220	DL1QT. . . . .161	K2BZT. . . . .133
W5ADZ. . . . .215	W1ALO. . . . .160	W4BQY. . . . .131
W8JBI. . . . .212	W1BLO. . . . .153	W5UX. . . . .130
W40M. . . . .210	W6DBP. . . . .153	W7HQC. . . . .130
W7HXG. . . . .201	W7KVU. . . . .153	W4AJD. . . . .130
W1BLF. . . . .200	W8YHO. . . . .152	W8HDS. . . . .127
W2TXB. . . . .200	CR6AI. . . . .151	ZE3JP. . . . .126
CN8MM. . . . .196	W3AYS. . . . .150	W9EUC. . . . .120
W5ALA. . . . .190	W0NLY. . . . .150	W9VP. . . . .120
W9GRV. . . . .190	W9MQK. . . . .142	W9UKG. . . . .116
G3DFC. . . . .172	W9JFP. . . . .141	K2EDL. . . . .111
W5FXN. . . . .171	W1HLL. . . . .140	W5UUK. . . . .111
L66U. . . . .171	PA0LR. . . . .140	W2CR. . . . .110

### Radiotelephone

W8BF. . . . .200	W1BLF. . . . .167	F8SK. . . . .131
W8GZ. . . . .200	W5ALA. . . . .167	W5KBU. . . . .130
CN19A. . . . .192	W4KLL. . . . .162	W7HXG. . . . .113
CN8MM. . . . .191	W1HX. . . . .151	LU8BS. . . . .113
W3GHD. . . . .181	W4GMC. . . . .150	W4EEE. . . . .110
W5ASG. . . . .173	W8BKP. . . . .150	W4GJ. . . . .110
W7BMX. . . . .170	W5KC. . . . .143	HP1BR. . . . .110
	W8VDJ. . . . .140	

### W/VE/VO Call Area and Continental Leaders

W4BPD. . . . .241	VE3QD. . . . .210	VE8AW. . . . .160
W5MIS. . . . .231	VE5QZ. . . . .140	W6EP. . . . .190
W9NDA. . . . .243	VE6GD. . . . .108	X4FRE. . . . .210
VE1HG. . . . .150	VE7HC. . . . .209	Z86AW. . . . .233
VE2WW. . . . .181		ZL1HY. . . . .238

### Radiotelephone

W2APU. . . . .202	W6DI. . . . .205	VE2WW. . . . .102
W2BXA. . . . .202	W7HIA. . . . .181	VE3KF. . . . .163
W4HA. . . . .180	W0AIW. . . . .179	VE7ZM. . . . .140
W5HGP. . . . .207	VE1CR. . . . .120	OD5AB. . . . .170
W6AM. . . . .205		ZL1HY. . . . .196

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

## ATLANTIC DIVISION

**EASTERN PENNSYLVANIA** — SCM, Clarence Snyder, W3PYF — SEC, NNT, RM: AXA, PAM: TEJ, E. Pa. Nets: 3610 and 3850 kc. New club officers announced by the Harrisburg Radio Amateur Club are VDA, pres.; YAH, vice-pres.; TMN, secy.; ADE, treas. Delaware-Lehigh ARC new officers are CBN, pres.; ZOM, vice-pres.; ZBE, secy.; QBF, treas.; and NF, act. mgr. The North Penn Amateur Radio Club reports PNL, pres.; VST, vice-pres.; WN3ZXV, secy.; and VTR, treas. This new club now boasts 98 members and still is growing. WUE made BPL for the first time. TEJ is the new E. Pa. PAM. NNT is the new SEC. BAC is now General Class and an OES. TTW has a new B&W 5100. ABT, at U. of P. ARC, had closed circuit TV and message-handling at the Annual Engineers and Architects Day. UKJ and her dad, UKF, are on a three-month vacation in Chile. The Eastern Pennsylvania C.D. Phone Net had a dinner at Bethlehem on May 7th. UA, State Radio Officer, was the main speaker. TEJ is looking for new members for PFN. The Net meets Mon. through Fri. at 1815 EDT. YDX was very active during the Mother's Day message rush and used a wire recorder to copy messages to speed up air time and transcribed them later. YA, ADF, BN, and MLY were present at the signing of the license plate bill by Gov. Leader. May I take this opportunity to thank Bill, BIP, for the good job he has done as SCM and for the cooperation he has given me in this new job. QOL is building a new kw., rockbound on 3850 kc., the PFN frequency. UQJ worked AJD on 220 Mc. for AJD's first contact on that band. BIP, now in retirement, is building a new shack and will be running high power by fall. Philadelphia received approval of the State Plan for RACES on May 10th. UA reports that the Cumberland County Plan also has been approved by FCDA and FCC and will be used as a model plan by other counties. The Tamaqua ARC holds code instruction every night at 7:00 p.m. PLY was elected manager of the AN Net for the fourth year. The Pennsylvania Phone Net will picnic at Hershey Park on August 14th. E. Pa. C.W. Net will picnic on the same day at a place to be announced. Traffic: W3CUL 1549, WUE 505, YDX 412, OK 214, TEJ 139, OZV 115, BNR 95, VVV 81, AXA 77, DUE 66, PLY 47, UWP 46, ABT 37, TAW 35, ELI 26, VOI 18, PLY 16, EAN 14, TTW 14, QZL 12, YGX 12, JNQ 3, ADE 2.

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA** — SCM, John W. Gore, W3PRL — WG and his family more than likely would take first place as a ham family in this area. The members of the family holding Novice calls are NYL, Peggy, ZQF; Freddie, 17, ZQL; Margat, 14, ZTE; Candy, 12, ZVE; Mike, 10, ZVD. It is expected that general calls will be acquired during the school holidays. The only other member of the family, Chris (6), has been subjected to all the di-dahing around the house by his brothers and sisters and has inhaled half the Morse alphabet and may be ready for a Novice ticket by the time he starts school in the fall. Governor McKeldin proclaimed the week of June 19-25 "Amateur Radio Week" for the State of Maryland. MTE describing "Wavemeters" on May 9th and JCI advising as to "Some uses for O-1 MA Meters" on May 23rd were the programs of the CARC, Baltimore. EQK presented film showing his Florida and Havana trip at the BARC meeting May 2nd. QZC is headed for Emory University in Georgia to study medicine and acquire a W4 call. UCR, at Aberdeen, acted as NCS for communications for the Convoy from Aberdeen to Baltimore on Armed Forces Day. ZOG-M/3 was stationed at Sheridan Armory; SCFN-M/3 and 90KI-M/3 were at Turner Armory; NNX and 5HOE-M/3 also participated. NNX acting as relay between the mobiles and Aberdeen. EQK was operated upon on the Tuesday after Easter. His convalescent period provided ample time for hamming, checking the transmitter, renewing tubes, with time out for a week's visit to

Ocean City, etc. RV reports the AEA Windbay Net started operation on 50.4 Mc. June 15th, shifting from 7240 kc. BKE would like schedules. He can handle traffic into Washington. ECP reports that the Washington TVI Committee shortly will release a film project which uses the REA film "Typical Television Interference Patterns" with an introduction by George E. Sterling, DF1AE, a former member of the FCC. The Washington Radio Club code class, which held its last meeting May 26th, resulted in Novice license qualification by 100 per cent of the group that completed the course, 60 per cent of which started the course last October. K3WBJ, Walter Reed Army Medical Center, now has two operators assigned full time, 1-SDO and 1-RKB. COK has at last worked his first JA and needs only two more cards to make DXCC. OYX, OXL, AKX, TJV, YRK, and VAM I participated in the CD Test "Operation Frederick Fireball" held May 15th. ZGN and AKC, of Frederick, have graduated to General Class. ZGN with perfect copy for his 5-minute code test. Traffic: (May) W3WVG 1377, WY 438, K3WBJ 500, W3UE 319, COK 155, RV 96, PKC 66, ECP 43, PG 29, BUD 8, NNX 6, OYX 4, BKE 3, WKB 2, (Apr.) W3WVG 661, CVE 238, TMZ 22, UCR 12, NNX 8, MCD 6, CDG 2.

**SOUTHERN NEW JERSEY** — SCM, Herbert C. Brooks, K2BG — SEC, W2ZVW, PAM, ZI, YRV now is manager of the Delaware Valley 2-Meter Net. Was also set up amateur equipment at the Philadelphia Electric Co. Hobby Show and handled traffic from the visitors. New Jersey Net (80-meter c.w.) members are planning a picnic for this summer. EAS is net manager. K2H2R is working hard trying to make WAS on 40 meters. Congratulations to K2CPR on having received the BERTA (British Empire DX Award), also WBE, Jack also is an Official Observer. ZVW is rebuilding between skeels. The Camden County (Area 11) RACES station has been put into operation and tests have been made with the Burlington County (Area 10) station. RG is Radio Officer of the Camden station and UA is RO of Area 10. Congratulations to the Tri-City Amateur Radio Club on becoming an ARRL affiliated club. We look forward to reporting the Club's activities each month in this column. K2CEF, reporter of the Southern Counties Radio Assn. news, is being transferred to the Naval Air Tech. Training Center, Memphis, Tenn. SDO recently erected an NJK antenna. 380B expects to be a W2 soon. K2BWG is headed for Japan. Good luck, Cliff. Scuttlebutt, the Hamilton Twp. Radio Assn. news, reports plenty of building. Special mention is made of BDA, BDK, EWS, CEP, and BMX. A Section Net certificate has been issued to SUG, Milford. UKS is Chief RO on the SS *North American*. Look for Bill operating NIM. K2INQ is operating 2-meter mobile. We wish HAZ a speedy and complete recovery from his recent operation. Traffic: W2RG 168, YRW 112, ZVW 80, K2H2R 55, BG 19, W2ASG 9, ZI 9, K2CPR 7.

**WESTERN NEW YORK** — SCM, Edward G. Graf, W2SJV — Asst. SCM: Jeanne Walker, 2BTB. SEC: UTH/FRL, RM: RUF, PAMs: NAI and TEP. NYS meets on 3610 kc. at 6 p.m. and 6:30 a.m.; NYSS on 3595 kc. at 5:30 p.m.; NYS on 3925 kc. at 6 p.m.; NYS C.D. on 3509.5 and 3993 kc. at 9 a.m. Sun.; TCPN 2nd Call Area on 3970 kc. at 7 p.m.; SRPN on 3970 kc. at 10 a.m.; ISPN on 3980 kc. at 3 p.m. The W.N.Y. Hamfest, sponsored by the RARA, was one of the most successful with 476 in attendance. The AREC meeting was addressed by RUF, mgr. NYS C.W.; AQY, asst. mgr. NYS Phone; ZOL, representing TCPN; with UTH, the SEC, as M.C. At a meeting in Syracuse, called by the Onondaga Co. EC, CYD, a Red Cross Amateur Radio Net for Central New York was organized, comprising the counties of Cortland, Cayuga, Oswego, Jefferson, Oneida, Madison, and Onondaga. The following were in attendance: BCK, RIP, JNM, VQV, RUT, CNO, ZHU, K2s DXP, DYB, CNR, FAA, FCD, and DUR. CYD, SZG, JPO, YEU, and K2KGQ represented CRD, the amateur station of the Red Cross. More stations are needed, especially in Jefferson Co. The Net will operate on 3925 kc. at 8:00 p.m. the 1st Mon. of each month. Officers of the Batavia Area are HJN, pres.; JIE, vice-pres.; K2DVC, secy. and comm. ch.; TON, treas. YGW has the call K2LSF for a second location. K2EVP reports K2GNG now is located at Fort Meade, Md. The power now is 60 watts at K2CLA. The RAWNY board meeting was held at the QTH of K2DJN. NYS Phone Net Mgr. TEP compiled the first issue of the Net sheets *Zero Beat*. EMW's DX now is 202 worked and 193 confirmed. Erie Co. C.D. issues a monthly bulletin edited by DVD. HVZ will continue to manage the a.m. session of NYS C.W. from Lake Placid for the summer and from college in the fall. The Elmira Area meeting was devoted to FD planning. RZP, PPY, and HXG renewed as EC. Thanks to IEP for



issuing the FB roster of the NYS 'Phone Net. Officers are TEP, net mgr.; AQY, asst. mgr.; NJL, net secy. QLI is busy rebuilding glass-melting units at Corning. After an absence of 18 years, ex-ICJ is back on as SSJ at Niagara Falls using a Viking II and an SX-96. Officers of the new Radio Amateurs of Greater Syracuse (RAGS) are RWJ, pres.; KUD, vice-pres.; ZCZ, secy.; TEB, treas. Former Rocky Mt. Director now is located at Potsdam with the call BB. The Otsego Co. AREC Net on 29.6 Mc. is monitored and/or operated 15 hours daily with one or more guard units on duty. AREC C.D. of Oneida Co. was very active in the April 30th test. The Rome Radio Club emergency unit, which is a converted school bus, now is in operation with 6 operating positions, a Viking II, 2, 6-, and 10-meter units. The net frequency is 3905 kc. Congrats to the Watertown Club, now an ARRL affiliate. CXM has been appointed OPS. Net Certificates were issued to EEB, BWK, DYB, and K2s DIO and HOS. Traffic: W2RUF 409, K2CLA 362, W2ZRC 304, HKA 251, K2IDJN 177, W2CXM 131, K2DSR 123, LSF 84, W2OE 61, OZR 57, K2IVZ 48, W2EMW 42, ZLT 39, DSS 26, RUT 21, SJV 14, FEB 13, UTH 7, K2AHM 6.

**WESTERN PENNSYLVANIA**—SCM, R. M. Heck, W3NCD—SEC: GEG. RMs: UHN, NUG, NRE, and GEG. PAMs: AER and VKD. Altoona items courtesy of KQD: The Muleshoe Radio Club class members under KQD produced the following new hams: WNs ZUF, BMU, CHO, and W3ZKM, ZUG, ZVA, and AFH. ZVA has a kw, and ZUG is mobile. The Horse Shoe Radio Club class members produced the following new hams: WN3s BKV, BSR, BVE, BZN, BTX, and AUD, with LQD as tutor. KFD, the president of HIRC, has gone mobile. LQD has loaned out 5 transmitters to Novices. UHM, almost mobile, and OUA are working on Scott Township c.d. outfit. ZDW is working 20-meter DX, OKU is s.s.b. on 40 meters. UUH is working 10 meters and putting finishing touches on mobile installation. The SCARC station now has 2- and 6-meter beams up. WHI is on 10 meters. VEF is mobile. 1MCA, formerly 3TMA, is on 3525 kc. week ends, TCP is radio-activating model airplanes. PTU is on the Commuters Net with RMX and others. On 10 meters we find RLH, SUL, and IIX. TYC still is with YLRL *News and Nets*. The Penn Central Radio Club of Falls Creek is an ARRL affiliate. The Breeze Shooters Hamfest was enjoyed by all. The SHIBPM outfit was at South Park for Field Day. New rigs: RYK has a BW 5100, KILL a Heath DX100. We find WN3CGP, MWG, KYC, BDW, and UJP working on antennas. UVD says the Weather Net now has 15 members. However, he could use help from Warren, Pa., and Olean, N. Y. If interested contact him via W. Pa. Net 3585 kc. at 6:30 p.m. The Indiana Amateur Radio Club operated on Field Day using club station call BMD. VKD says the 20-meter band is giving the DX fellow a break these days. Ed Balogh, formerly of Indiana, now is 6VHC. The West Alb. C.D. Net is getting regular attendance from those using State-owned power plants. The West Charlie Net is getting off to a good start. KA2DV/W3WIW is back in the States. VKD received first place award for W3 in the VK/ZL 1954 Fall Contest. VKD was visited by SDQ, of Akron, who now is on all bands using a new Johnson KW. At a recent Radio Association of Erie meeting a pocket-sized 10-meter receiver was demonstrated by MED. YWL says his son YMW, Grove City College, has been working back home on 75 meters. NXX has a new Elmac for mobile. Recently visiting in Erie were 8BQO, 4BHN, and 8BKM. The untimely death of GV comes as a shock to his many friends. The newly-elected directors of the RAE are Doc Sheldon and Bart Geer. WDK and YKE now have DX100 kits. OIH now has new Morrow converter. Mercer County Radio Association members who turned out in the recent nationwide Civil Defense Test were QHS, VK, SYZ, YEW, and GEG. Traffic: (May) W3W1Q 2757, LXQ 96, YA 49, UHN 42, TAW 35, NUG 24, KNQ 19, VKD 11, NCD 10, KUN 3. (Apr.) W3NUG 15. (Mar.) W3NUG 26.

## CENTRAL DIVISION

**ILLINOIS**—SCM, George T. Schreiber, W9YIX—Section nets: ILB c.w., 3515 kc. Mon. through Sat.; IEN 'phone, 3940 kc. RAE: BUK and MRQ. PAM: UQT. EC: HOA. EC Cook County: HPG. Congratulations to LOY and YBC, elected respectively to the national presidency and vice-presidency of the YLRL. Only three made BPL this month: DO, c.w.; and IDA and YWL, 'phone. YWL made it for the third month in a row. Nice going, fellows. Incidentally, there are new grandsons for DO and VHD. And while the congratulations are being passed out, flowers to HYK, who celebrated his 82nd birthday, and to WPY, who is a young 76. A new ORS this month is ZMJ. EC for Schuyler County is BH; for Rock Island and Mercer County RYU; Mason, VBH, and Hancock OXS. The Nonand Net of MARS has been reactivated with the following reorganizing members: YEZ, JGL, KHL, MRK, QAO, ZGX, LSQ, DEI, RHN, EXG, and SH. The Net meets on 27,994 kc. Wed. at 10 p.m. Central Time. ITM and QMO now are members of the U. S. Coast Guard Auxiliary. Lightning struck the antenna of HUX and caused severe damage to both the transmitter and receiver. USI is pleased with the increasing activity on 6 meters. CSW

tells us the North Central 'Phone Net completed two years on the air in May and rolled up a traffic total for the month of 531 messages. NIU is mourning the storm damage to a tree that held his antenna and moans the fact he now will have to put up a stick. Congrats to OQI and his XYL, UXL, on their new son, Stephen; and additionally to UXL, who finally worked her 48th state, Wyoming. The OM has only 47 at this writing. CLH tells us he is on all bands 160- to 10-meter 'phone and c.w. PCF plans a cubical quad as a summer project and also a three-band vertical to try and snatch some of those rare ones from GD1, his neighbor. New calls heard are Novices UGA, YN1, and ZOR; Technical NAX; and General FCC. No, he is not an R.I. The Kankakee Novice Net meets at 2100 Daylight Time Mon. through Sun. on 3735 kc. Present members are WNS, OUS, NAX, YN1, ZOR, TBX, and TXH. The St. Clair County Amateur Radio Club issued 10-contact certificates to KUJ and Novice OAN. UWP has an Elmac in his car and enjoys mobile. RSY and RSZ, father and son, have a new NC-125 on their operating table. BPU spent a well-earned vacation in the Southland visiting some of the ham friends he has worked these many years. The summer slump in news seems to have set in, fellows; send in your items by the fifth of the month. Watch for the announcement soon of the Illinois QSO Party. Traffic: W9DO 1428, YWL 855, IDA 617, CSW 250, AA 149, YIX 55, VHD 50, BUK 47, VXS 43, SMI 41, CEE 38, STZ 35, USI 34, QQG 31, ZMJ 31, CZB 28, CTZ 26, VEY 25, LXJ 19, OVH 18, OR 17, FRP 14, PHE 13, MRQ 10, LL 8, BA 2, UVM/9 2, KLD 1. (Apr.) W9UVM/9 7.

**INDIANA**—SCM, George H. Graue, W9BKJ—Communications for the Armed Forces Parade in Evansville were handled by RACES members. FJI, ABW, and LBD assisted in a Boy Scout Camporee radio demonstration at Garvin Park. BKJ and EOG furnished communications for Anthony Wayne Council, Boy Scouts, at its annual Camporee at Columbia City. PMT and FMJ assisted in Ft. Wayne. More than 1500 boys made up the tent city. Code practice was sent by FMJ and several boys made perfect copies. ZIJ has joined the Marines. NTR is leaving for Texas for the summer. WUH is the new Vanderberg County EC. New at Vincennes are N9RFA, NSN, VSD, YSH, and VZK. DIR received appointment to the Air Academy at Denver. 6PKM, ex-N9EC, visited Evansville. EHU again was winner of the hidden transmitter hunt. TARS will award a DX-100 transmitter at the annual hamfest Aug. 28th. MOC/KL7 and SCX/VO6 can be contacted on 20-meter 'phone. EGQ, EQO, and NTA are the proud possessors of the A-1 Operators Award. CAEN reports 22 sessions with a traffic total of 41. WWT reports for RFN with a traffic total of 175. IFN Net, as reported by NTA, had 53 sessions and traffic total of 239. MARC members SIHW, DDA, BRM, NAR, EZS, and YRF assisted in the Armed Forces Day Parade in South Bend. SMW has a DX-100. ZHJ has a new Viking Ranger. ZDS is being transferred to New Orleans. MAM overhauled the club's 2½-kw. power plant. TT has a new telephone pole for a mast. BKJ's old rig is no more. VNV and KDV are taking a two-month cruise on the Mediterranean Sea. EQO is building an s.s.b. exciter. CEA is a new ORS. NTR has a new 75A-4 receiver. EHU made DXCC. DKR finally is on 3.9-Mc mobile. UTL won the 'phone SS award for this section. NH is rebuilding again. AYD has a Viking mobile installation. JUJ's report was received after making BPL 48 consecutive times. Traffic: W9NZZ 1029, TT 707, WWT 420, UQP 182, EHZ 142, BKJ 131, ZYK 116, STC 85, WBA 85, DHJ 83, CTF 81, NTA 70, QYQ 62, TQC 58, VNV 48, PQA 47, SKP 42, HRY 39, DOK 36, SVL 29, AZF 24, CMT 24, WRO 24, WUH 20, ALL 19, CEA 18, TG 17, EQO 16, CC 14, GDL 13, ZIB 13, BDP 12, YVS 11, QR 10, HSG 5, NTR 5, FGX 4, PIN 4, DKR 3, KDV 3, UTL 3, NH 2, PPI 1.

**WISCONSIN**—SCM, Reno W. Goetsch, W9RQM—SEC: OVO. PAMs: ESI and GMY. RMs: IXA and RTP. Nets: WIN, 3685 kc., 7 p.m. daily; BEN, 3950 kc., 6 p.m. daily; WPN, 3950 kc., 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile and c.d. frequency: 29,620 kc. CXY participated in Armed Forces Day with QSOs with WAR, AIR, and NSS. FFC received his 20-w.p.m. Code Proficiency certification. DVM worked 8 states with his Ranger loaded up to his screen window! CCO received a QSL from ZL2FI. CHD is on 14 Mc. IIDQ, GZS, and CDD are going to give 50 Mc. a whirl. ZLD is president of UW Ext. Club. HAT is mobile on 4 Mc. AJU's dad WN9VFO and sister WN9VFP are new calls in Ashland. AJU takes over as WPN mgr., replacing SAA, who is QRL with other duties. DIK has a new Heathkit VFO. IJU reports the Polecats well represented at the Monroe Hamfest. IAL has a new NC-240D. KKK is shopping for a new 20-meter beam since a wind-storm blew down his old one. ECs KTE, REQ, and IYF are promoting activities on 29,620 kc. IDH is rebuilding. ONY has worked 14 countries from mobile. GHG has a Viking II and an S-76. After an absence of 20 years, KNP is back in Milwaukee on s.s.b. with an 813 and HRO-50T w/slicer. LDH and DJE are active on RTTY. FAF and VYO are active on 7-Mc. 'phone. YZA worked WAC in 4 days using a Viking II and a 44-ft. vertical. Congrats to IIQT, who has a new baby girl. OLV is on with a Viking

(Continued on page 78)



## Tee-Notch Filters



MANY times in a ham shack or in the laboratory, occasion arises for the need of a simple circuit which can be used to "null out" or "notch out" a very narrow band of frequencies. For example, at audio frequencies if an amplifier were fed with a 400 C.P.S. input signal, if at the output we could trap out the 400 C.P.S., the remaining audio power present would be the harmonics of the original 400 C.P.S. and thus would be had a simple and effective distortion factor meter.

A BRIDGED tee network that performs this function has been available for a number of years and has been used at audio and also r.f. frequency to at least as high as 50 Mc.

WE at Hallicrafters prefer to call it a tee-notch filter and we use it for all sorts of trap circuits around the plant and in the laboratory and also find it very effective to trap the fundamental output of a transmitter to measure the remaining total harmonics.

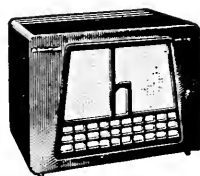
ONE fine feature of this network is that its insertion loss is reasonable, about 3 db at 50 kc., and also, its suppression of the desired frequency may be as much as 60 db. It's simple, stable, and normally does not require any tubes if the circuit to which it is added has 3 db. of reserve gain.

WE feel that this tee-notch filter has many advantages in receivers and for those of you that want more detail a data sheet has been prepared. A postal or QSL card addressed to me will insure that you will receive one of these sheets.

—Fritz Franke

*Buell Halligan, Jr.* W. J. Halligan W9AC

for **hallicrafters**



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# SSB SUPERIORITY-*Collins*

Collins 96 Amateur distributors throughout the country are selling the finest in SSB gear, assuring you of the *best* performance, the *most* for your money. The KWS-1, most versatile kilowatt Transmitter ever offered, features greatly reduced distortion, selectable sidebands and operation on SSB, AM and CW. The 75A-4 Receiver features passband tuning, a mixer-type SSB detector, rejection tuning, and AVC on SSB, AM and CW. For complete information on this brand new line, write or visit the distributor nearest you.

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# New

## Heathkit VFO KIT

MODEL VF-1

**\$19.50**

Ship. Wt. 7 lbs.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard 1/4" crystal holder. Construction is simple and wiring is easy.

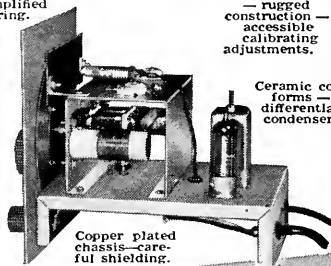
- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OAZ voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

Open layout—easy to build—simplified wiring.

Smooth acting illuminated dial drive.

Clean appearance—rugged construction—accessible calibrating adjustments.

Ceramic coil forms—differential condenser.



Copper plated chassis—careful shielding.

## Heathkit AMATEUR TRANSMITTER KIT



MODEL AT-1

**\$29.50**

Ship. Wt. 16 lbs.

### SPECIFICATIONS:

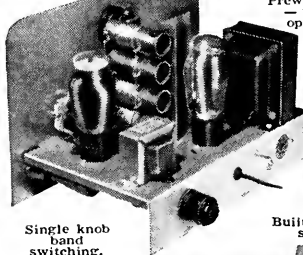
Range 80, 40, 20, 15, 11, 10 meters.  
6AG7 ..... Oscillator-multiplier.  
6L6 ..... Mixer-oscillator.  
504G ..... Amplifier-doubler.  
105-125 Volt A.C. 50-60 cycles 100 watts. Size: 8 1/2 inch high x 13 1/8 inch wide x 7 inch deep.

Crystal or VFO excitation.

Prewound coils—metered operation.

52 ohm coaxial output.

Rugged, clean construction.



Single knob band switching.

Built-in power supply.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

## Heathkit COMMUNICATIONS RECEIVER KIT

Four band operation 535 to 35 Mc.

Stable BFO oscillator circuit.

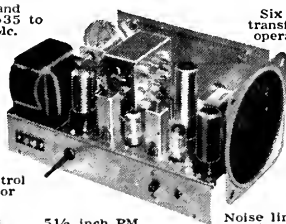
RF gain control with AVC or MVC.

5 1/2 inch PM Speaker-Headphone Jack.

Six tube transformer operation.

Electrical bandspread and scale.

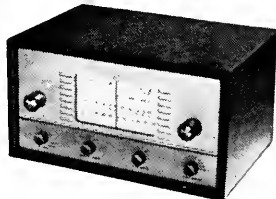
Noise limiter—standby switch.



### SPECIFICATIONS:

Range.....535 Kc to 35 Mc  
12BE6 ..... Mixer-oscillator  
12BA6 ..... I. F. Amplifier  
12AV6 Detector—AVC—audio  
12BA6 ..... B. F. O. oscillator  
12A6 ..... Beam power output  
5Y3GT ..... Rectifier  
105 - 125 volts A.C. 50-60 cycles, 45 watts.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.



MODEL AR-2

**\$25.50**

Ship. Wt. 12 lbs.

### CABINET:

Proxylon impregnated fabric covered plywood cabinet. Shpg. weight 5 lbs. Number 91-10, \$4.50.

**HEATH COMPANY**  
BENTON HARBOR 9, MICHIGAN

# New HEATHKIT DX-100

# PHONE AND CW TRANSMITTER KIT



MODEL DX-100

Shpg. Wt. 120 lbs.

**\$189.50**

Shipped motor freight unless otherwise specified. \$50.00 deposit with C.O.D. orders.

- R.F. output 100 watts Phone, 125 watts CW.
- Built-in VFO, modulator, power supplies. Kit includes all components, tubes, cabinet and detailed construction manual.
- Crystal or VFO operation (crystals not included with kit).
- Pi network output, matches 50-600 ohms non-reactive load. Reduces harmonic output.
- Treated for TVI suppression by extensive shielding and filtering.
- Single knob bandswitching, 160 meters through 10 meters.
- Pre-punched chassis, well illustrated construction manual, high quality components used throughout—sturdy mechanical assembly.

This modern-design Transmitter has its own VFO and plate-modulator built in to provide CW or phone operation from 160 meters through 10 meters. It is TVI suppressed, with all incoming and out-going circuits filtered, plenty of shielding, and strong metal cabinet with interlocking seams. Uses pi network interstage and output coupling. R.F. output 100 watts phone, . . . . . 125 watts CW. Switch-selection of VFO or 4 crystals (crystals not included).

Incorporates high quality features not expected at this price level. Copper plated chassis—wide-spaced tuning capacitors — excellent quality components throughout—illuminated VFO dial and meter face—remote socket for connection of external switch or control of an external antenna relay. Preformed wiring harness—concentric control shafts. Plenty of step-by-step instructions and pictorial diagrams.

All power supplies built-in. Covers 160, 80, 40, 20, 15, 11 and 10 meters with single-knob bandswitching. Panel meter reads Driver Ip Final Ig, Ip, and Ep, and Modulator Ip. Uses 6AU6 VFO, 12BY7 Xtal osc.-buffer, 5763 driver, and parallel 6146 final. 12AX7 speech amp., 12BY7 driver, push-pull 1625 modulators. Power supplies use 5V4 low voltage rect., 6AL5 bias rect., 0A2 VFO voltage reg., (2) 5R4GY hi voltage rect., and 6AQ5 clamp tube. R.F. output to coax. connector. Overall dimensions 20 3/4" W x 13 3/4" H x 16" D.

## Heathkit GRID DIP METER KIT



MODEL GD-1B

**\$19.50** Shpg. Wt. 4 lbs.

with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

The Invaluable Instrument for all Hams. Numerous applications such as retuning, neutralization, locating parasites, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1 1/4 meter Ham bands. Complete frequency coverage from 2—250 Mc, using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at \$3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial

## Heathkit ANTENNA COUPLER KIT



MODEL AC-1

**\$14.50** Shpg. Wt. 4 lbs.

Poor matching allows valuable communications energy to be lost. The Model AC-1 will properly match your low power transmitter to an end-fed long wire antenna. Also attenuates signals above 36 Mc, reducing TVI. 52 ohm coax. input—power up to 75 watts—10 through 80 meters—tapped inductor and variable condenser—neon RF indicator—copper plated chassis and high quality components.

## Heathkit ANTENNA IMPEDANCE METER KIT



MODEL AM-1

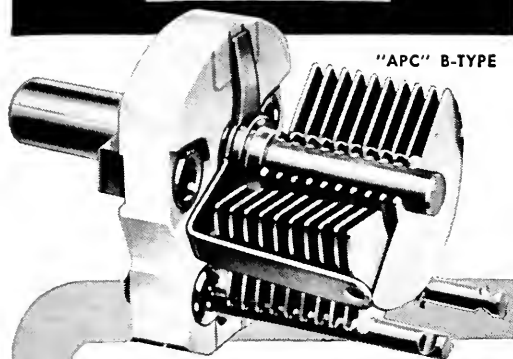
**\$14.50** Shpg. Wt. 2 lbs.

Use the Model AM-1 in conjunction with a signal source for measuring antenna impedance, line matching purposes, adjustment of beam and mobile antennas, and to insure proper impedance match for optimum overall system operation. Will double, also, as a phone monitor or relative field strength indicator.

100  $\mu$ a. meter employed. Covers the range from 0 to 2000 ohms. Cabinet is only 7" long, 2 1/2" wide, and 3 1/4" deep. An instrument of many uses for the amateur.

**HEATH COMPANY**  
A SUBSIDIARY OF DAYSTROM, INC.  
BENTON HARBOR 9, MICHIGAN

## AT YOUR DEALERS



## APC Capacitors With E-X-T-E-N-D-E-D Shafts

In response to many requests from amateurs, experimenters and electronic equipment builders, Hammarlund is now offering APC — B Type, and MAPC — B Type Capacitors as standard items through Hammarlund Authorized Dealers.

These are extended-shaft versions of the well-known APC and MAPC capacitors. They permit knob-control or shaft coupling.

The original APC trimmer was designed and first produced by Hammarlund more than 20 years ago, and is used in all classes of equipment where a compact high-quality air dielectric trimmer is needed. The MAPC type is similar to the APC except that it is a miniaturized version.

Range of the APC series is from 3 to 140 mmf and for the MAPC, 2.3 to 100 mmf.



For your free copy of the Hammarlund Capacitor Catalog, which gives listings of the complete line of standard capacitors, write to The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1. Ask for Bulletin C8.

# HAMMARLUND

(Continued from page 72)  
II and an HRO-50T. IXA put out another FB issue of *WIV* News. The Polecat Net picnic was held June 12th near Green Lake. RACES facilities were given a good workout during the National Test June 15-16. A preliminary meeting of RACES net operators was held in Wausau May 30th. On May 31st NUV was operated on emergency power from Rib Mt. for 12 hours as NCS on 29,620 kc, dispatching mobile units over a radius of 60 miles to time the State Endurance Motorcycle run. Those participating were VHA, JBF, RQM, OVO, RLB, FCF, QJB, and CFT. Traffic: W9CXY 547, SAA 275, FFC 143, DVM 101, IXA 101, CCO 42, RTP 41, BVG 37, YZA 33, AJU 28, RQM 23, GMY 20, SZR 16, KWJ 10, DIK 8, OVO 5, IU 4, RKP 3, UIM 3, IAL 2.

### DAKOTA DIVISION

**NORTH DAKOTA** — This report is being made by W0EOZ in the absence of an SCM. PAM: GZD, PHR. Dakota Division Director, has appointed GZD and EOZ as Assistant Directors for the State. The Jamestown Amateur Radio Club is building an 813 rig. NPR reports he will be QRL this summer working and will not be able to keep up NCS on the phone net. OEL has a Collins now and expects to put up an all-band skywire soon. EOZ has been QRT rebuilding for TVI, and is back on the air after hanging the skywires that came down in the May winds. YIZ is rebuilding. QJP has gone to Camp Grafton for two weeks with the National Guard. AVT has accepted a position with the CAA at Jamestown, but still commutes to Fargo week ends. The Bismarck gang reports the ham-boree is shaping up well. NOTE — In case a new SCM has not been elected by July, please mail or relay your reports to EOZ before July 6th. Traffic: W0VCQ 84, UVH 67, NPR 11, EOZ 2.

**SOUTH DAKOTA** — SCM, J. W. Sikorski, W0RRN — Asst. SCMs: Earl Shirley, 0YQR, and Martha Shirley, 0ZWL. SEC: GCP, PAMs: GDE, BNA, NEO, and PRL. RM: SMV. YQR started out as Pennington-Meade County EC with a bang — signing up ten new AREC members. Bob Mitchell, 1SWX, formerly of Ellsworth AFB, has returned from Europe and has been discharged. He can be reached at his home QTH. SMV stuck up a vertical and his first two contacts were KH6 on 7 Mc. and his first VK in 18 years on 14 Mc. KYL is moving to Sioux Falls. After many months, RRN is mobile with Viking and 3BR. O0Z engineered the job. Net reports: NJQ, QNI 433, traffic 83; 75-net, average daily QNI 35, average daily traffic 6; C.W. Net, 13 sessions, 87 QNI, traffic 45. Since you will have a new SCM next month, I wish to thank you all for your cooperation during the last five years. Traffic: W0GDE 71, PHR 67, SMV 42, SCT 27, BQH 16, RRN 13, RSP 4, O0Z 2, GWS 1.

**MINNESOTA** — SCM, Charles M. Bove, W0MXC — Asst. SCM: Vince Smythe, 0GGQ. RMs: KLG and DQL. PAMs: JIE and UCY. TUS has been appointed OPS. The Minnesota Junior Net, MJN, needs members. The Net meets on 3690 kc, on Mon., Wed., and Fri. KJZ and IRD, both members of the YLRL, attended the YLRL Convention at Milwaukee. Lydia was appointed as Tenth Regional Chairman by that body. She also was instrumental in bringing to the Twin Cities the 1956 YLRL Convention to be held next May 25th, 26th, and 27th. UCE has a six-element beam on 20 meters. Yes, six elements. SFC has a new 500-watt rig on the air. SLH and his XYL were visitors at GWJ's home. It seems that GWJ and LEH were former members in the same Air Force Fighter unit in communications during World War II. They recently set up a 40-meter schedule to continue old friendships. CO is getting a new Collins KW for s.s.b.c. QNY is working on some ARC-5 gear for emergency and mobile. QDP now is ORS. The Stillwater High Radio Club is now officially an ARRL affiliated radio club. Anyone wishing to attend meetings should contact VOC, who lives at 1022 So. 4th St., Stillwater, for information on the time and place. SZJ now has a new Ranger which he assembled. UGV, of Appleton, and RSP, of Marvin N. D., both on 2 meters, held a fine round table with four other stations. SZJ was on 75 meters working cross band. ZSJ was surprised to find that 2 meters is so active in the rural communities. IRJ had a nice visit with EYH at camp. Traffic: W0KLG 183, KFN 143, KJZ 139, WDW 131, WMA 101, TUS 95, QDP 78, DQL 74, IRJ 59, RLQ 43, MVJ 40, UCY 40, MBD 38, WVO 38, RVO 36, GTX 32, FCU 27, LST 26, LUX 24, TKX 22, NTY 20, OPA 20, OSJ 14, VOA 14, WAA 13, MXC 12, BUO 7, HAH 6, AFP 5, QNY 5.

### DELTA DIVISION

**ARKANSAS** — SCM, Owen G. Mahaffey, W5FMF — Your SCM lost out on some of the State activities by having the flu for two weeks. The Union County Amateur Radio Club soon will be on the air with a Viking II and an HQ-140X. The Club is conducting code classes each Tue. and also is working on a civil defense set-up. A new ham at El Dorado is AXQ. ECs for the month are ZBX and ZJL. We are all sorry to hear of NDH's illness and hope he has a speedy recovery. Traffic has picked up on both the c.w. and

(Continued on page 80)

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**HAMMARLUND**

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'phone nets. We hope we can continue to improve and think we can as several members are new at handling traffic. Those having appointments, take note of the expiration dates and mail them in for endorsement, please. Traffic: W5WUN 64, SXM 47, VAA 29, JZL 22, DAG 16, FMF 14, EXN 10, HEE 7, RPB 6, VAN 6, SYQ 4, ZJI 2.

**LOUISIANA** — SCM, Thomas J. Morgavi, W5FMO — The Mansfield ARC has become affiliated with ARRL. VRO should be on the air soon with his new Globe King. GFA is going s.s.b. APH has a new mobile rig. SWQ, discharged from the AF, now is living at Vinton. BSR, CCD, ZJS, SKW, and TVH, all mobile, furnished communications for the c.d. police in the Armed Forces Day Parade. The Westside ARC's DX Contest was won by INL, with BUK and KOQ second and third. K5FFA makes BPL again with 906 messages handled. YSN is active on RN5 and MARS. HEEJ resigned as PAM because of poor health and MAV has taken on the job. The Monroe Hamfest was a huge success with an attendance of about 275. New EC's are TKV and RRO. EYF, new OBS, sends Official Bulletins on Mon., Wed., Fri., and Sun. at 8:00 p.m. CST on 7180 kc. New OP's include FKA, SUM, and UGJ. ZAB is going s.s.b. KC had his beam spinning around like a top during a severe windstorm but it was not damaged. He is ORS and DXCC. The Mayor of Buena Park, KSI, met Virginia (the NYL of TIBX) at the New Orleans Airport en route to San Jose, Costa Rica, to meet her OM. EA is looking for 'phone patch traffic into Alexandria. FKA, active in the Baton Rouge Emergency Net, reports HKZ is building a new transmitter. UGJ has a new mobile in operation. Thanks for the reports. Keep them coming. Glad to have met a lot of the fellows at the Baton Rouge and Monroe hamfests. Traffic: K5FFA 906, W5NG 98, NDV 95, MXQ 92, EA 48, UGJ 10, FKA 2, EYF 1.

**MISSISSIPPI** — SCM, Julian G. Blakely, W5WZY — SEC: PFC. PAM; JHS, RM: WZ. This has been a season of hamfests and the "eye-ball" contacts made should carry us through until next season. Don't forget the next big 'fest is at Jackson on the last Sunday in August. JHS won an Elmac Rec. at the Mobile Hamfest. The Centreville Amateur Radio Assn. (CARA) has been organized with W5GIF, pres.; KN5ALP, vice-pres.; Jimmy Templeton, secy.-treas.; GDW, PIO; KN5BAI, act.; FCB, advisor. YAR has been appointed OBS for N. Miss. Listen for the latest League and FCC information on 3935 kc. at 8 p.m. Mon., Wed., and Fri. DRP has General Class license and is our first OES appointee. YFJ has increased power with a BC-610. IGW is running a cool 300 watts on the Mississippi Rebel Net as NCS. Traffic: W5VME 260, IGW 177, YFJ 136, JHS 123, YBH 75, EIDE 54, EWE 36, KYC 27, RIM 17, WZY 16, OTD 14.

**TENNESSEE** — SCM, Harry C. Simpson, W4SCF — SEC: RRV. PAM: PFP. RM: WQW. Congratulations to PVD on the certification of his DXCC. He sends a breakdown on Tennessee DXCC members: TM 213, NNH 182, AZD 170P, MKB 167P, AAW 133, QT 124, AQR 120P, MB 120P, NBV 116, DPE 110, NDE 109P, KKK 102, IIB 101P, GD 101, PVD 100. PL suffered a severe heart attack in mid-May but says he is doing OK. Send him a card, fellows. PFP reports the Mid-Tenn. group has chosen 50.41 Mc. as its 6-meter Net frequency. WQW sends roses to WQT and WOX for their origination of such fine traffic on Armed Forces Day. In turn, they send thanks to those who cooperated with them so nicely. VNE and WQW have been fixing up their shacks. DMU announces that the Davidson County 10-meter Emergency Net meets Sun. and Wed. at 7 CST, 29.6 Mc. He also advises that the Old Hickory Club will send a certificate to any ham working five members. OEZ reports from Nashville that AEE, AY, VFC, and RFR are now on 6 meters; he also says the RACES plan has FCCDA approval. The Middle-Tennessee 2-meter Net shows 14 members on its current roster. ZBQ, on 6 meters, worked 1 Minnesota, 2 Texas, and 2 South Dakota stations and heard a CO2. FLW reports that the Tri-County Club operated on Field Day from Paris Landing State Park. The Memphis Club again is sponsoring a ham school at Memphis State College, under the able direction of DCH. WQT reports the Clarksville ARC operated on Field Day from Howard Petus Park. WOX and YRI are being transferred to Italy. SCF visited OIW, PFP, and WQW and has been modifying an RCA KW, courtesy of the 3rd Army. K4FEU is being transferred to KW6-Land. WIJ is leaving Cookeville, headed for DX-Land, too, says UWA, who is going back to Kentucky for the summer. WXL will be in North Carolina for the summer. Traffic: W4PL 813, K4FEU 246, WIOGG 238, WQT 236, WOX 197, WQW 183, PFP 142, POP 125, IIB 103, SJ 76, YMB 74, JV 57, SCF 53, HIH 18, VJ 31, UWA 20, ZBQ 20, CXY 17, VNE 17, FLW 9, PAH 8, HLR 7, DCH 2, HUT 2, LRO 2, NDC 2, DMU 1, HXS 1, OEZ 1, PVD 1.

## GREAT LAKES DIVISION

**KENTUCKY** — SCM, Robert E. Fields, W4SBI — SEC: CDA. RM: KKW. Acting PAM: NIZ. The Acting PAM reports the following statistics for May: 30 sessions of KPN, 550 total call-ins, 18,333 stations per session, 201 traffic total, 6.7 messages per session. He also reports that traffic is on the increase in spite of the very poor receiving conditions. RM KKW reports for the KYN c.w. nets: 62

sessions, 43 active stations, traffic total 320, 7.4 per session compared to May 1954, with 56 sessions and only 30 active stations. June will have come and gone when you read this, but I am sure you will have enjoyed every minute of it with picnics, hamfests, c.d. test, and last but by far not least, Field Day. OMW has been working some choice DX lately: OE3JIE, 4X4FO, YU3IG, GW3FYR, LA3BD, YN1KK, and H1BLF/T. His DX now totals 85 stations. JSH, chairman for Field Day activities in Lexington, is getting c.d. organized locally. He also is Deputy Communications Director for the 5th mobile support group. ZIB has a walking power mower. We know. We just had a QSO with Moose, ZDA, Doc's NYL, in which she stated that ham radio was much more fun than mowing the lawn. We agree. Traffic: W4KKW 225, K4FAV 112, W4SBI 81, RPF 82, ZDA 69, ZIB 56, QCD 39, HSI 29, BZY 25, KRC 18, JSH 11, BAM 13, SUD 13, WBD 9, IAY 6, JUI 2.

**MICHIGAN** — SCM, Thomas G. Mitchell, WSRAE — Asst. SCMs: Joe Beljan, SSCW (c.w.); Bob Cooper, 8AQA, ('phone). SEC: GJH. It is a real pleasure this month to thank all contributors for the news items received. Keep them rolling in. The one new appointment this month went to WJP as OES. Cliff, formerly 9OC of South Bend, now is residing in Shepherd. DAP is building a new receiver and expects much from it. WVL visited 3MIE after seven years of QSOs and QSPs. FX currently is rebuilding a Traf-He Master. Ex-SCM HKT, the country squire, is "frosted" over his frosted strawberries. HSG is justly proud (and so are we) of his revised ham license plate bill which passed both branches of the Legislature without a single dissenting vote. Cos still is pitching for us and getting the support of his colleagues. PHA is QRX for summer duty at Ft. Campbell, Ky. FSZ reports that SCW admits possession of a microphone, TIJ and RXY have towers back up after a wind storm, and Skutt is QRL painting and fishing. New officers of the Motor City Radio Club are YDR, pres.; PJD, vice-pres.; SKJ, secy.; NBF, treas.; and FWW, custodian. TBP and the Muskegon group still are plugging c.d. work on 29.06 Mc. The Niles Club members are working on common 144 Mc. portable-mobile transmitters and receivers as a club project. These are planned for use in RACES work. UKV introduces NYL UFZ, who used to be 2RTZ. QKQ says that his move threat is over and he expects to stay in Saginaw. MGQ has new 8005 modulator and 4E27s cooking on 75 meters. FGB is wrapped up in 160-meter DXing. He has worked G, VP7, YV5, KP4, and has a heard report from ZL3I! For the rest of us, TIC sums it up pretty well by saying that this warm weather is fine for outdoor work. Traffic: (May) WSNOH 238, PHA 242, NUL 234, ILP 133, FX 119, ZLK 85, SWG 84, DAP 69, SJF 61, SCW 58, IJ 56, QIN 30, QQQ 28, TBP 28, RAE 23, NTC 21, WVL 21, HSG 13, COW 11, DLZ 11, AUD 8, TQP 8, HKT 6, PHM 6, WJO 6, INF 5, FSZ 4, MGQ 4, PDF 3. (Apr.) WSIXN 45, SIB 34, OQH 21, TBP 16, TQP 10, QKQ 8, OT 4. (Mar.) WSTQP 15.

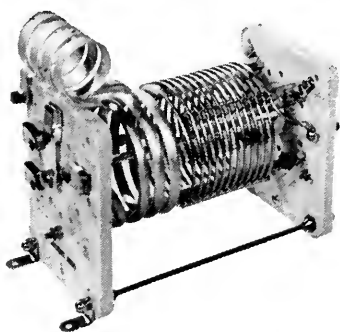
**OHIO** — SCM, John E. Siringer, W8AJW — Asst. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8JNF; and O. V. Bonnet, 8OVG. SEC: UPB. RMs: DAE and FYO. PAMs: EQN and HUX. New appointments made during May were ZCV as OES and 5BRM/8 as EC. The Wright-Patterson AFB Club used KP as its Field Day call. The Club station call is K8FAD. MGC has installed a V-37 vertical. PBX won first prize at the Madison, Ind., Hamfest. On May 1st the Findlay group had a timed emergency run, (13 minutes for 5 miles), which they feel is mighty good. New Findlay Club officers are QP, pres.; UN, vice-pres.; and QKO, secy. JDN has joined MARS. GDC has installed an emergency-power unit. The Medina Co. Club now meets at the Lodi State Bank Bldg. the last Tue. of each month. WE's NYL has made WAS. BAI is a new Novice in College Hill. Ohio has been well represented in 8RN sessions, according to DBX/SG, net manager, with NVJ, a relative newcomer, carrying much of the load. We have learned that FYO's mother has been seriously ill. We wish her a speedy recovery. WNSVLL, MBE, and MNR finished one-two-three in the Toledo mobile hidden transmitter hunt of May 15th. New Van Wert Club officers are DIIIG, pres.; ASL, vice-pres.; OWC, secy.; AGL, treas.; and PIZ, act. mgr. On May 14/15 the Toledo amateurs had an amateur station set up at the Explorer Scouts Exposition. New Toledo Radio Club officers are BJQ, pres.; BN, vice-pres.; RZQ, rec. secy.; RBX, corr. secy.; and RZM, treas. The CACARC has abandoned the summer picnic but is lining up a technical session for early fall and also planning a county-wide QSO party. We congratulate the Cincy Mike & Key for publishing the Radio Amateur's Code. This should appear more frequently in more publications! OVARA's *Ether Waves* states that BQT, BRA, CGY, EV, GY, KBJ, and WBY all were transferred to Cincinnati as a result of A.T. & T. relocating its central office. The Dayton R. F. Carrier informs us that the Hobby Show of May 12/13 came off with a "bang." The DARA Field Day committee established awards for high-scoring groups and outstanding operators during the Field Day activities; and FPZ has been made director of the W3/S call areas for the TCPN. The Early Bird Transcontinental Net (3845 kc.) roster includes Ohioans AMH, FJV, GDB, FPZ, and K8FCJ. Springfield's Q5 mentions that IKB, HBJ, HOL, and HTE will be featured monthly speakers during monthly meetings, starting with

(Continued on page 84)

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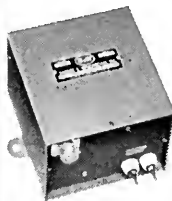
Model 2Q4 splits any audio signal from 300 to 3000 cps into two equal amplitude components  $90^\circ \pm 1.5^\circ$  out of phase with respect to each other . . . for SSB operation.

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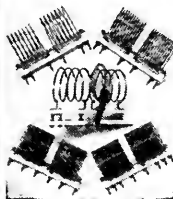
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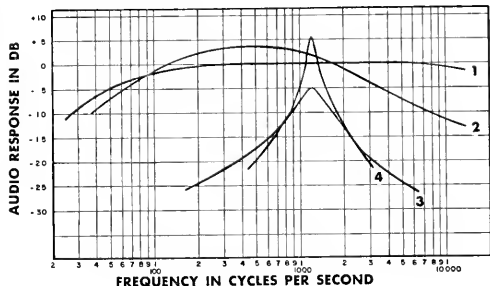
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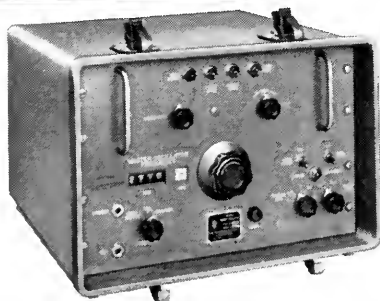
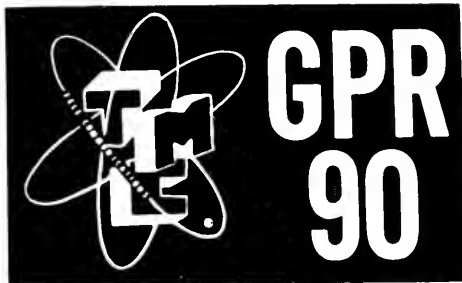
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6BA6 IF Buffer Amp.	OA2 Regulator
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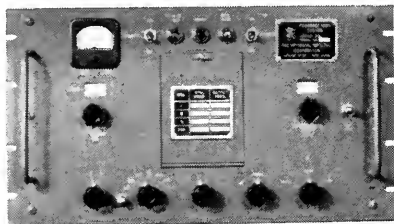
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(Continued from page 80)

June. The Columbus *Carascope* relates that EA is on 40-meter c.w. with 25 watts; HUE has a new 50-foot tower; ZCK has a new 20-meter antenna; and DWG is a senior in physics at Ohio State. Toledo's *Shall Gossip* lets it be known that HCN and QCT are now mobile; VPZ has a new jr. operator; WMO and WTW are new Toledo Novices; and the Toledo U. Radio Club has a home-built 500-watt transmitter on the air. Eastern Ohio's *Ham Flashes* reports that KYL, of Cortland, is the first RTTY station active in the area; NXK was elected president of the Salem Lions Club; 0MPQ has moved to Youngstown; TDD, of Alliance, passed his General Class exam.; DXO has changed QTH; and new Novices in Warren are WHV, WAF, and WRP. FRY, editor of *Ham Flashes*, recently had a paralytic attack. Speedy recovery. Don! Traffic: WSNVJ 288, HR 236, ARO 180, UPB 174, DAE 153, RO 112, AL 61, HNP 59, FJV 51, HPP 41, AJW 39, AMH 36, JHH 30, IUX 28, QXH 25, EQN 24, IJH 24, ZAU 23, LYD 14, OPX 12, AJH 11, PBX 11, CZ 10, LMB 10, TLW 10, HFE 9, NZC 9, KDY 8, RN 8, PJ 7, APC 6, AQ 6, ET 6, MGC 6, LGR 5, VUS 5, BLS 4, DG 4, IAY 4, KIH 4, WYL 4, THJ 3. (Apr.) WSNZC 7.

## HUDSON DIVISION

**EASTERN NEW YORK** — SCM, Stephen J. Neason, W2ILI — SEC: RTE. RMs: K2BJS and TYC. PAMs: GDD and IJG. The Ladies' Auxiliary of the AARA is to be congratulated on a job well done in sponsoring a recent dinner party held at the Shadow Box near Albany. The affair was well attended and many guests, including your SCM, were present. The Club soon will celebrate its 45th anniversary. Congrats to K2BJS, who earned a BPL medallion plus a Public Service Award. The HHRL will stop publication of *Zerobeat* for the summer. K2EUF will attend R.P.I. in the fall. Congrats to TEP, manager of NYSEPN, and those responsible for the publication of *Zerobeat*, the new net bulletin. Look for this net on 3920 kc. Mon. through Sun. at 1800. From all indications and reports, our Eastern New York clubs have enjoyed a very successful season. The coming season looks even more promising, since many are planning more activity and social events. Yes, there is a club located near your home. A card or message to the SCM will bring information. K2CQS finally has gotten his s.s.b. signal on the air. AWQ is getting out FB on 144 Mc.; the rig is a Gonset. K2HXR dropped the "N." Our best wishes for a safe and enjoyable trip go to our busy SEC, RTE. Ted will visit France and Germany while on a trip lasting several weeks. All AREC matters will be handled by Assistant SEC LEL during Ted's absence. The Eastern New York Council of Radio Clubs extends a cordial invitation to ALL of the Eastern New York clubs to take part in our council activities. For full information, please contact EFU, secy. TYC still is on 7 Mc. but claims conditions unfit for QTC work. Don't forget your endorsement date. Traffic: K2BJS 82, EHI 76, EDH 31, BE 22, EKE 17, W2EFU 15.

**NEW YORK CITY AND LONG ISLAND** — SCM, Carleton L. Coleman, W2YBT — Asst. SCM: Harry J. Dannels, 2TUK. SEC: ADO. PAM: NJL. RMs: VNJ and LPJ. ZAI has found it necessary to resign as SEC and ADO has taken over this important post. Thanks to Jim for his fine work and let's all cooperate with Mike in his new position as SEC. All ECs report to M. Mulligan, W2ADO, Box 134, Westbury. VNJ reports that the NLI Net is now on summer schedule (Mon., Wed., and Fri., 3630 kc. at 1930 EDT.) KGN resigned as EC for Brooklyn and K2CRH took over. HDV has taken over as Radio Officer for Brooklyn. K2GMC is EC for Manhattan and OQI is EC for Brookhaven. K2HYK had his best traffic total to date. New appointments: WFL as ORS K2s EQH and IDO as OBSS. All ORSS, OPSS, and stations handling traffic are urged to report traffic totals regularly. KN2LGR is on 80 meters with 807 and ARC-5 receiver. ELK installed 2-meter mobile rig in his new car after a battle with 12-volt conversion. The Eastern Suffolk RC now has over 50 members and is still growing. New officers of the NYU RC are K2EOF, pres.; GHH, vice-pres.; KN2JHM (M), secy.-treas.; and FSO, trustee. The Order of Boiled Owls RC placed 9th in the country in the SS Contest and 2nd on a points-per-man basis. K2AMP is building an electronic keyer. AEF discontinued major station activities for the summer. VDT built a secondary frequency standard. PF would like to see an s.s.b. traffic net. Anyone else interested? IN has a new 30-foot telescopic mast for 2-meter antennas at Brewster QTH. We regret to report that CZV has joined Silent Keys. LGK's jr. operator is now KN2OFO. K2KXZ dropped the "N." Ditto for K2IAD, who plans to use a BW5100 with his HQ-140X. K2HSZ is going on 2 meters. K2KNA has a new Vizing Adventurer. The NYU RC station, DSC, has a new BW5100. New officers at Columbia U. RC are KN2IKI, pres.; OLA, vice-pres.; KN2LQN, secy.; K2IDUY, treas.; DAL, tech. dir.; and K2CUI, comm. mgr. K2AUM started a 50-Mc. mobile rig. K2BAH has a new beam for 144 Mc. New officers of the NYRC are CMM, pres.; UWG, vice-pres.; ATT, secy.; and OGX, treas. YBT is back on the air with 100 watts. New officers of the Fordham RC are K2CWQ, pres.; PRR, vice-pres.; IGS, treas.; HVC, corr. secy.; and K2CCN, rec. secy. Club directors are IVG, IN, ZYC, IGS, and K2s BRK and CQY. The Club now boasts

of more than 100 members. K2HII soon will be in W6-Land. BTA is on 220 Mc. with a QST-brewed rig using 6360 final. DLO has crystal converters for 6, 2, and 1 $\frac{1}{4}$  meters. K2IDO expects to start handling traffic soon. K2CQP/2 can be heard from summer camp at Andes, N. Y. New officers of the Nassau RC are MDM, pres.; VL, vice-pres.; K2GQA, secy.; K2HEA, treas.; and PC, GLU, and K2BMD, trustees. ONG keeps skeds with his son, HUW, in Plattsburg, N. Y. Keep the reports coming during the summer! Your reports are needed prior to the fifth of each month in order to meet the schedule. Traffic: (May) W2VNJ 256, K2HYK 207, W2OME 108, K2ABW 87, W2GXC 75, MUM 72, WFL 68, K2AMP 67, W2AEE 60, VDT 33, PF 23, K2CRH 20, W2IN 19, LGK 18, OBU 17, K2HID 15, W2TUK 13, K2KXZ 6, W2MDM 5, EC 3, IVS 3. (Apr.) W2AEE 426, JGV 95, K2HID 45.

**NORTHERN NEW JERSEY** — SCM, Lloyd H. Manamon, W2VQR — SEC: IIN. PAM: CCS. RMs: NKD, CGG, and EAS. DXD is off on a round-the-world business trip and will be away from the home QTH for about three months. K2BWQ has new Collins KWS-1 and 75A-4. K2EQD is back from a Naval Reserve cruise to Florida. Network activities in NJN are slowing down a bit because of summer activities. JKH is off the air until the fall season rolls around. K2HXP has built a new rig and would like to get in touch with W2HXP. If W2HXP could arrange a sked it would be appreciated. KN2KHZ is burning up the air these days. So far he has worked 31 states. K2CHI is active in RACES nets. CVW is QRT for a few weeks because of a moving job which has to be done. K2GAS received a G. E. certificate for participation in emergency traffic nets during the past hurricane season. K2IKS is going mobile. John has just been discharged from the Army and plans to attend school in Potsdam, N. Y., in the fall. NYI still is QRL work. K2IBC was on with nine half-hour code practice transmissions last month. The Windblowers V. H. F. Society has a new banner designed by ISK's XYL. KN2MPE is a new station in the Livingston Area. NIE is the new Civil Defense Comm. Officer for Interlaken. At this writing all hands are hard at work preparing for "Operation Alert 1955." From all indications RACES activities in the section will reach a new high during the period of the test. State Civil Defense authorities are counting very heavily on amateur radio to carry the bulk of traffic which will flow from the bombed-out areas where land lines have been destroyed. New Jersey State RACES networks have accepted the challenge and are ready to take over. Our thanks go to the County ROS who have made the program possible. A late news flash has brought the good news that the new amateur license plate bill has just passed both branches of the State Legislature and is before the Governor for signature. NUI has done a fine job in following this project to the bitter end. There have been many adversers along the road but he has stayed with it. He has appointed a new committee to meet with the Director of Motor Vehicles to pave the way for the Governor's signature to the bill. The new committee is composed of ZI, IIX, and your SCM. We hope by the time you read this column the bill will have been signed into law. The State Director of Civil Defense and Disaster Control has promised to lend a hand in putting the importance of this bill before the Governor. K2ICE has a new horizontal array on 144 Mc. NIE is mobile on 144 Mc. from his yacht, the *Jane K*. Traffic: W2EAS 216, K2GFX 75, BWQ 58, W2CCS 42, K2DSW 29, W2FPM 19, K2IKS 17, HLA 8, W2NIY 3, CFB 2, CJX 2.

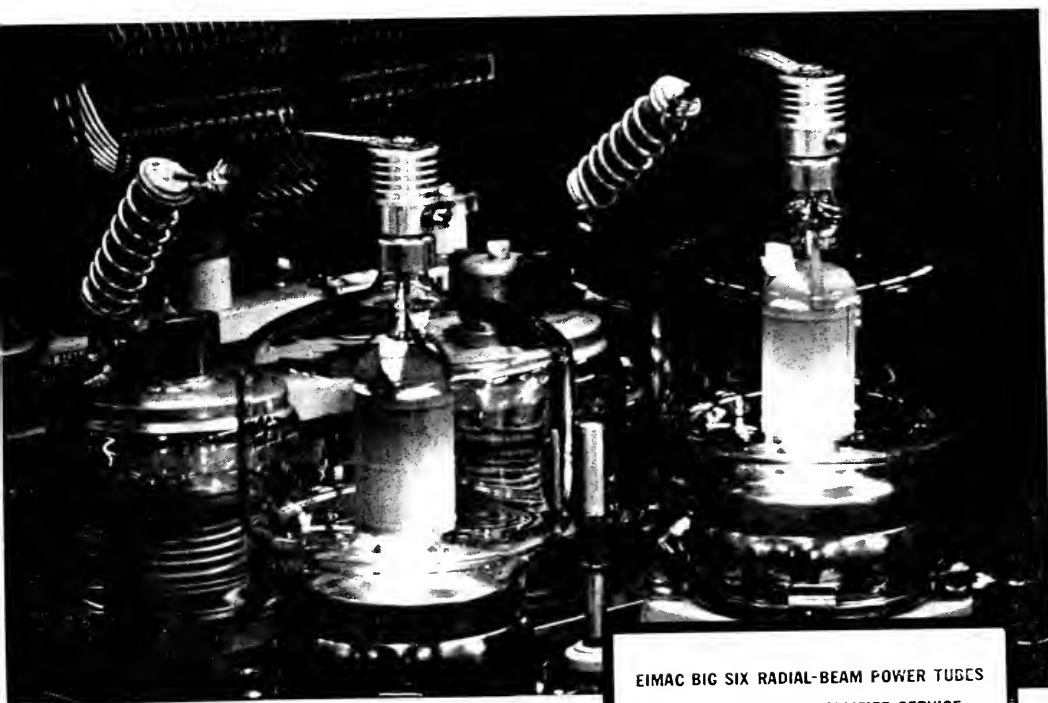
## MIDWEST DIVISION

**IOWA** — SCM, William G. Davis, W6PP — Well, this is my swan song, fellows. It's been a great satisfaction to serve you these many years. Please give your full cooperation to your new SCM. He can't do his job without it. New WNs in Humboldt are ZPM and ABE. LJW reports the Davenport Club was in there on Field Day. CGY has a new NC-125 and is active on TLCN. DST is scraping the bottom of the barrel looking for DX. HMM has an active class. SCA finally made the 'phone net. He reports his lowest monthly score in 18 months was 1117. QVA reports that NWX (FOSAJ of Clipperton fame) gave a talk to the Clinton Club. BDR addressed the Waterloo Club. KVJ had to curtail his TLCN activity on account of his work. QVA converted his Ranger for grid-block keying and likes it very much. SCA fixed his new Ranger likewise. TLCN members at the Quad City Hamfest were BLH, FDL, HMM, LJW, PKT, and QVA. Two new hams in Burlington are Novice BKL and Technician ASX. SEF again is active on the net. Well, that's it, fellows. Thanks for all the notes. I shall miss the job but I'll never forget the experience and the fine bunch of fellows I've worked with. So long, and 73. Traffic: W6BDR 1530, SCA 1271, FZO 710, CZ 321, QVA 124, LJW 113, SQE 97, BLH 48, LGG 35, KVJ 33, NGS 18, PAN 14, PKT 13, SEF 9.

**KANSAS** — SCM, Earl N. Johnston, W0ICV — SEC: PAH. PAM: FNS. RM: KXL/NYI. The SCM's new address is 1100 Crest Drive, Topeka, Kansas. The Udall tornado disaster is top news this month. REP, of Mulvane, found out from Mulvane Police at 2350 May 25th that the town had been leveled. He fired up his fixed station with his XYL ZTH at the mike and took out for Udall in his mobile

(Continued on page 86)

# How to select a tube for single sideband



To realize the advantages of Single Sideband operation, there are two important points to keep in mind when selecting a final amplifier tube. First, since there is no continuously running carrier, high peak powers may be reached when a signal is put on the air. And second, because it is easier to produce an SSB signal at a low power level, it takes more than an ordinary tube to build this valuable low power signal from the modulator to high power in a single amplifier stage. Eimac tubes offer these extras. Their reserve supply of filament emission, lack of internal insulators and widely recognized ability to handle high peak power has been proved over the years. And high power gain is inherent in all Eimac multi-grid tubes. When planning or building an SSB rig, remember these two important points and consider the Big Six of Amateur Radio—Eimac 4-65A, 4-125A, 4-250A, 4-400A and 4X250B radial-beam power tetrodes and the 4E27A radial-beam power pentode.

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4-125A	2500	555	100	300
4-250A	3000	600	110	630
4-400A	3500	750	135	980
4X250B	2000	350	50	500
4E27A	2500	600	110	325

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arriving at 0025 the 26th. ZTH called SIG on the land line and SIG and YMG took off for Udall. At 0045 BAH called in and at 0220 UCS arrived at Udall with his mobile. Then the portable rig was set up at 0600 under the call of ULR 0. Participating thus far were BIX, ULR, UCS, ZMY, MAR, BIX, CLK, IAL, and BVQ. At 0900 OZN took over the NCS and SOE the Wichita Red Cross station and emergency traffic was handled throughout the day! Hats off to those who did such a wonderful job. PAH, our SEC, reports that YUQ M and he used their mobiles to keep Manhattan posted on the tornado activity May 27th from 2130 to 0030. PAH was on Blumont Hill and YUQ at Police Hq. UAR, KPE 0, and NFX assisted. Christy's picnic and the CKRC picnic were well attended. Traffic: (May) W0BLI 472, N1Y 321, REP 269, MXG 210, OHJ 187, UAT 115, FNS 101, SQX 86, ABJ 60, WWR 59, RKO 55, EOT 37, FIDJ 32, NFX 31, SVE 27, BET 24, YFE 21, SAF 19, KAJ 18, ICV 15, LOW 12, UAU 12, IFR 11, CET 6, KSY 6, KXB 6, PAH 6, YVM 6, QGG 4, RXM 3, YJU 3, KN0ADV 2, (Apr.) W00LJ 382, KFS, 9, KN0AHW 3.

**MISSOURI** — SCM, James W. Hoover, W0GEP — SEC: VRF. PAM: BVL. RMs: OUD and QXO. OMGP has a new 750-watt final. VRF reported that RVG, the Kansas City Red Cross station, handled tornado traffic from Kansas and Oklahoma. The Northwest St. Louis Radio Club received a station call, K0AXU. An emergency drill was held in Kansas City on May 29th and was very successful. GAR's line noise let up during May, and his traffic total is back up. The Suburban Radio Club held its annual dinner-dance. The Club is 100 per cent ARRL again this year. VWZ is a new member of MON. QXO traveled 4500 miles on his vacation. YQJ visited OUD and DE in Joplin. SCV helped CPI raise his 75-meter antenna another ten feet. YHL has a new mobile. SPU has installed a 95-amp. generator in his car for mobile work. New officers of the Bandhoppers Radio Club are LTT, pres.; JNK, vice-pres.; ENN, secy-treas. MON will continue the morning and evening schedule for the summer. Traffic: (May) W0CPI 1313, GAR 548, GBJ 366, OMM 244, YTF 194, RTW 93, CKQ 92, SAK 77, YPQ 51, IIR 45, QXO 32, BVL 25, KIK 17, EBE 16, GEP 14, MRQ 9, IJO 8, VWZ 8, MFB 6, TCF 5, ECE 3, BUL 2, (Apr.) K0FCT 262, W0VPQ 47, KA 5, ECE 3J.

**NEBRASKA** — SCM, Floyd B. Campbell, W0CBH — Asst. SCM: Tom Boydston, W0YX. SEC: JDJ. The Union Pacific Amateur Radio Club has been organized at North Platte. NET is chairman, KWQ vice-chairman, CBH secretary. KN0AKW was incorrectly reported recently as having a Globe Scout. He is using a Heathkit AT-1 and an S-40-A. It should have been KN0AKV instead of KN0ARV. Two new calls at Scottsbluff are KN0BBC and KN0BBD. A new call at Mitchell is KN0BJT. RHL has been processed for overseas duty, with Greenland as the intended assignment. DQN is working very hard on the 2-meter rig. GDZ is mobile. WN0V KQ and WN0V KE are on 2 meters. A code and theory session is held on 2 meters every Tue. at 7:00 P.M. CST. A 30-minute discussion is held on theory. Code is sent tone-modulated and lasts almost an hour. The following are ECs: MTL, YQR, UFZ, COB, DQN, GDZ, RYG, LRK, and URC. We are very much in need of ECs in the eastern part of the State. LRK is working on something for more selectivity on mobile converter. A new call at Orchard is KN0AMY. COB and his XYL stopped in for a very nice chat and informed us that a TVI committee has been formed in Sidney. COB is the chairman. KQX and GDZ can be heard operating from Estes Park for the summer. The North Platte Club meets the 1st and 3rd Tue. at the Fire Station. Traffic: (May) W0ZJF 310, DDT 153, AEM 48, ORW 47, MAO 29, KVM 26, NIK 22, FRS 21, HTA 14, K0WBF 13, W0PUT 12, VGH 12, ERM 11, SEZ 9, PPT 8, FMW 7, LEF 7, BEA 5, QOU 5, UJI 5, BTG 4, CHH 4, DJU 4, DQN 4, KFY 4, ZNI 4, K0AFO 3, W0CBH 3, THX 3, DDP 2, KLB 2, NGZ 2, OCU 2, (Apr.) W0DQN 12.

## NEW ENGLAND DIVISION

**CONNECTICUT** — SCM, Milton E. Chaffee, W1EFW — SEC: LKF. PAM: LWV. RM: KYQ. MCN and CN 3640 (0645 and 1845), CPN 3580 (1830), CTN 3640 (Sun. 0900), and CEN 29,580 kc. Traffic for CN reached 192, averaging 7.3 messages and 9 stations per session. MCN traffic hit 97, with 3.89 and 7.08 as the same type averages. QNI leaders were CN, RGB, LIG, ZDX, and YNC; MCN: IBE, RGB, and RFJ. MCN discontinued the Sat. schedule because of lack of traffic and interest. We seem to have hit new '55 lows for traffic all around. New General Class licenses are reported by CLD and CKA in Bristol. ODW reports RACES activity from DUL plus his own DX, which totals 151 worked and 135 confirmed. The Redding Radio Club meets the 4th Tue. and seeks ARRL affiliation. Real response to your SCM's plea for EC nominations came from the Middlesex RA to cover that area. Meriden has added several Gonsets to the mobile c.d. fleet to divide the group between 10 and 2 meters. FYG reports the club was active on Field Day from West Peak. RGB reports for the TIJ gang, which holds regular c.d. drills and has the following active: YFG, QGV, IWY, ZVJ, QMB, EBO, LF, DIT, and IJD. The TIJ crew includes RGB, STT, WHR, and PIP. ZKK is racking up DX using a Viking II on 20 meters, the

same for ZTQ with less power. BVB is using 40 meters only these days. A new Stratford Novice is FPX. The Stratford Club meets Wed. and welcomes visitors. OO reports came in from GIX, BVB, and RFC. Traffic honors again go to YBII who gets 'em all on the 'phone nets. More news from the clubs would be especially appreciated so how about loading me with stuff, fellows? Passage of the license plate bill made a lot of the gang happy but we wonder what it will do for the police — one more combination for them to figure out. Anyway, don't try to get them before 1956 renewal time. Traffic: W1YBH 245, RGB 180, LIG 112, KYQ 102, CUB 84, AYC 76, AW 75, EFV 75, UED/1 52, YYM 49, ZDX 28, YNC 26, LV 25, KV 20, BDI 18, TIJ 16, HYF 11, DXI 6, BVB 5, GIX 5, GVJ 5.

**MAINE** — SCM, Allan D. Duntley, W1BPI/VYA — The Pine Tree Net meets 5 nights a week on 3596 kc. at 7 P.M. The Barn Yard Net meets Mon. through Sat. at 0800-0930 on 3960 kc. The Maine Phone Net meets Mon. through Sat. 1700-1800 on 3940 kc. The Teen Age Forest Net meets Sat. and Sun. 1000-1100 on 3900 kc. As this is my first report as SCM, I want to thank all who supported me. I will pledge myself to carry on the work of the fine gentlemen who have held the position before me. Your continued support of the League is solicited. EFR, of Portland, has been appointed RM. I am sure that under Earle the Pine Tree Net will continue to do its usual good work to serve the people of Maine. Congratulations to the UAQs on a new pink harmonic. WRZ is on the air with a new mobile rig. TWR is forsaking his YLs on 75 meters to work new and greener fields on 20 and 15 meters. NXX now has to share his rig with the XYL, who is WN1FNJ. Look for these new WNs: FKJ, Maynard Bray; his XYL, Shirley, FKK; FHG, Ed Tarbox. DEA is now in the Air Force and looking for contacts back home. Let's not forget Stevie's (BOK) Hamfest Aug. 14th at Dexter. DEG now is K4CYC and is keeping daily skeds with LHA. AZQ has changed jobs and is missed on the Barn Yard Net. YGO and YGP are heard operating portable 3 in Hartley, Md. Traffic: W1WTG 180, TVB 70, NXX 54, ZME 52, UDD 40, LKP 36, LYR 22, EFR 19, SDW 14, TGW 8, BAD 7, YVN 7, BDP 6, BBS 3, TKE 3.

**EASTERN MASSACHUSETTS** — SCM, Frank L. Baker, Jr., W1ALP — Appointments endorsed: JNV, MKW, LQQ, VHH, and BGW as OOs; ISU, Hlbrook, PJ Everett, SS Lincoln, LQQ Hamilton, VYI Topsheld, CLF Norfolk, HKG Malden, MFI Barnstable, TJW Falmouth as ECs; LQQ as OBS; LQQ and GDQ as OPSS; MEG as OES; WU as ORS. Sorry to have to announce the death of LET of Everett. PYZ, RCA, EHY, FCJ and LJJ are on 2 meters. EHJ is new in Lynn. Heard on 75 meters: GYZ, LBH, and LQ. SKIH visited hams in this section. FIR, Medway, and FNM, Quincy, are new Novices. REG is Radio Officer for Mass. Area 2 and AYN for 2B. MON moved to Derry, N. H. Area 1 Radio Comm. held a meeting with KTG, AR, CQ, DWY, ZYX, AWA, ALP, TQP, and QQL present. The Middlesex Radio Club code class has turned out the following new Novices: EZU, FAV, FQB, FGS, FTY, FIO, FIM, FIL (a YL), FJE, FJE, FMW, FOG, FOC, FOL, FRY, FFT, FFV, and ETB. JNV has 163 countries and is working on a new beam. Radio Amateur Open House held a meeting and TON spoke on the benefits of ARRL affiliation. CTR writes Division news for the National Union magazine, *The RR Telegrapher*. The South Shore Club had a talk by MME and an auction with AKY. YLV reports that the gang at the AFRC mostly 2 meters are PYT, QBT, JOJ, JBU, IRF, AFE, YLV, and RFB. ABJ has 20-meter two-element, cubical, quad and raised ground plane. BGW still is RTTY. EPE is NCS of 1RN on Tue. UKO has a new SX-96. IBE has a new antenna for 80 meters. DFY now has General Class. QLT has a Viking Adventurer. The T-9 Radio Club elected WNK, pres.; MVQ, vice-pres.; KON, secy.; CVM, treas. TJP is a new member. EK has a 500-watt power plant. VYS is on 6 meters. QMU is building a 10-meter converter. SXD is working on a crystal converter for 2 and 6 meters. PIW is trying stacked dipoles on 10 meters. HOL has a 6-meter Gonset. UH is on 20 meters with a new beam. LMU visited W8-Land. The Bedford Radio Club had an exhibit of amateur radio two-way communications at the annual Lions Club carnival. WKM has two Gonset 2-meter rigs. AEC has a new 10-meter ground plane, also one for 20, 40, and 80 meters; with a rhombic in mind on the 3½-acre club grounds. New Novices in New Bedford are FJI and FJQ. VRK had ½-kw. on all bands. JLN has a Viking Ranger and Maritime Mobile certificate No. 108. MTG is running kw. to grounded grid 304-TH. MGP is working the world on 15 meters with 25 watts. OGG has a new Telerec 20-meter beam and a coax ground plane. NLU has a new Viking KW. EQP and FAO are father-and-son Novices in Marblehead, also ELA and ELB. The North Shore Amateur Radio Assn. for C. D. has a new TBS for the club station. JEL has a new kw. bandswitching rig. CMM, JEL, TRE, MTG, and MGP met KZ5GD and KZ5DG at JLN's QTH. SHV is Radio Comm. Officer for Lynn C. D. AXA used a helium-filled balloon for a sky hook in the DX Contest. JLN is operating from his New Hampshire summer QTH as FOE. The Winthrop drill had 22 stations on with DLY, EAJ, DQF, BDU, CMW, DEL, DJ, OIR, DPN, DRP, DUV, IIFJ, MQB, NMX, TTH, BOX, UOC, VIS.

(Continued on page 88)



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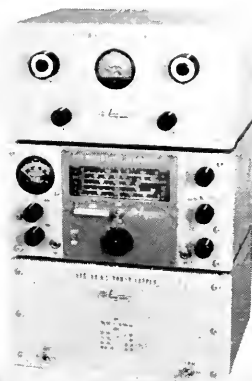
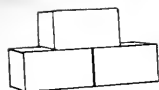
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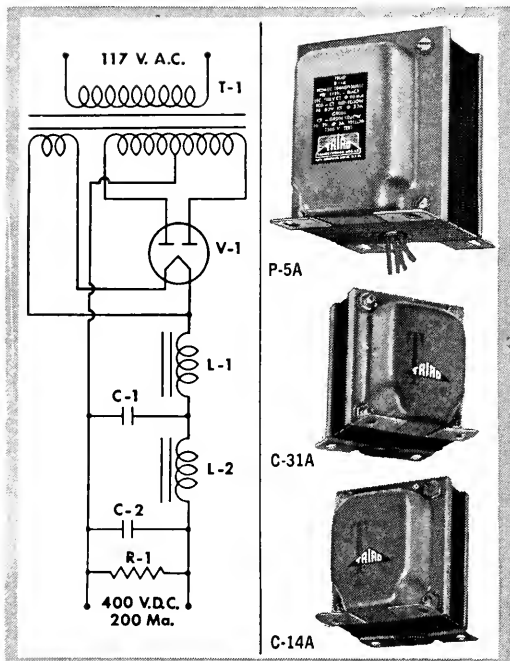
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4055 Redwood Ave., Venice, Calif.



ZVO, TEO, QA, and BB reporting in. A new Novice in Winthrop is FHE, a YL. The following members of the Section 1-B Net were on in the monthly test: DUO, SH, FWS, GNK, IPE, YFA, DW, KWD, WUW, CLF, MGL, ISU, ALP, AJU, VTT, MME, WFQ, ZWQ, VJD, MD, and KPX. Traffic: (May) K1WAB 1089, W1EMG 519, UKO 254, LYL 233, EPE 173, IBE 132, AVY 81, CLF 62, LM 37, WU 8, DFY 6, CAM 2, BB 1. (Apr.) K1WAB 953, W1BGW 52, QLT 8, ABJ 2.

**WESTERN MASSACHUSETTS** — SCM, Osborne R. McKeraghan, W1HRV — SEC: RRX, RM: BVR, PAM: QWJ. The WM C. W. Net meets on 3560 kc. Mon. through Sat. at 1900 EDST. The WM 'Phone Net meets on 3870 kc. Wed. at 1800 EDST. The 'Phone Net is coming along fine with SYX as net control and MNG liaison to the C. W. Net. A Section Net certificate was issued to WEF. VNH is a new EC. BYH, Fitchburg, is a new OPS. COI's OPS certificate was endorsed. AJX received a WANE certificate. YCU made WAS on 'phone with a Viking I. TVJ passed the 2nd-class commercial radiotelephone exam and will try for 1st-class soon. BVR had a visit from KH6AR. BYH and CKC have their General Class tickets. WN1DGL and CMS expect General Class tickets soon. ICW is C. D. Area 4 Radio Officer. QLZ has built a mobile rig. NPL is holding code practice for several SWLs. DPY is going s.s.b. with a 10-B. The Montachusett Amateur Radio Club, Fitchburg, is newly affiliated with ARRL. SPF reports hams in the Worcester Area did a fine job helping to locate a downed plane. The HCRA group of 30 enjoyed a visit to ARRL Hq. with BDI and CUT as hosts, followed by a trip to W1AW. The Amateur Radio Assn. of the University of Mass. has new officers: VSX, pres.; UAN, vice-pres.; San Soucie, treas.; URI, secy. The Worcester C. D. 'Phone Net drills Mon. at 1700 on 28.72 Mc. WPW, formerly of E. Mass., is active on the 75-meter traffic nets with a Viking II and a 5X99 from Athol WN1ZBA and DOI have their General Class tickets. LRA is in charge of RACES communication in Westfield. A new Novice in Springfield is WN1FKP. ALL, LIW, TAY, OUI, and WXF are very active with mobiles. Traffic: W1HRV 146, BVR 112, RRX 85, WEF 78, MNG 48, ZUU 34, ABD 26, TAY 22, AJX 16, YCU 14, BYH 10, HRC 10, DVW 8, DPY 4, WPW 3.

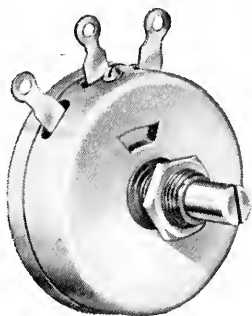
**NEW HAMPSHIRE** — SCM, Harold J. Preble, W1HS — SEC: BXU, RMs: CRW and COC, PAM: CDX. Note that COC has been appointed an additional RM. He and CWX will divide the State between them. Contact either one for information. CDX is PAM and wants more OPS for the traffic net. CCE has been appointed OPS. The Concord Brasspounders held an initiation May 14th. Ten candidates were made members. W1QGU/K2BH is back at Snowville for the summer. CWX made BPL in May. APIK's son Bruce is now N1E2C. DAE has his General Class license. IP says traffic is slack and he is chasing DX. Welcome to Novices N1FTZ and N1ELW, father and son, also N1ECB, N1ECC, N1EEQ, N1EET, N1EFY, N1EJB, N1ELW, N1FCU, N1FDC, and N1EHE. The Great Bay RA held its annual clam chowder May 21st at the Hampton Beach Fire Station. Seven radio clubs from Massachusetts and New Hampshire were represented. Many old-timers will be grieved to learn of the sudden death of ex-W1CMR, formerly of Manchester but later New York. ARR is working VKs, ZLs, and KH6s on 40-meter c.w. during the early morning hours. Traffic: (May) W1CRW 505, ARR 217, WUU 45, CCE 24, COC 19, HOU 16, FZ 9, CDX 7, IP 7. (Apr.) W1CRW 422, GMH 22, ZIW 13, WBM 12, YHI 7.

**RHODE ISLAND** — SCM, Walter B. Hanson, jr. W1KKR — SEC: TQW, PAM: VXC. RM: BTW. The PRA Dinner Dance was attended by more than 250. AEI received the "outstanding ham" award, and there were prizes galore. CRA's new officers are BTV, pres.; ZPG, vice-pres.; POP, treas.; BQH, secy. The CRA also set up 2-meter gear at the YMCA and handled over 100 messages for the public, relaying to BTV and the First Regional Net. VXC reports RIIN on 29.260 Mc. really is rolling with more cities reporting in at 1930 EDST. YAO checks in on the Newport County Net on 29.530 Mc. and is working on an ARC-4 for 2 meters. There is much more activity on 10 meters since the band has shown signs of life. Heard regularly are MK, CEW, HJB, VWR, SBP, HEH, KKE, YYQ, and mobiles YKQ, BTV, OAV, and RVO. A report was received from 4CVO/1, via Rawlins, Wyo.; who needed a vacation after a teaching course at NCRC. YNE is back on and racking up log time. He says the W4s are the best for QSLs. Lots of new gear is going in at the Situate Control Center. NZR can be found there almost every Saturday afternoon and could use a hand now and then with the equipment. Traffic: W1BTV 376, VXC 102, UTA 55, ZXA 31, ZPG 25, CEW 12, W4CVO/1 12, W1ZDS 8, YNE 6.

**VERMONT** — SCM, Robert L. Scott, W1RNA — Nets: VTN meets on 3520 kc. Mon., Wed., and Fri. at 1830 hours; VTPN on 3860 kc. Sun. only at 0930 hours; GMT on 3860 kc. Mon. through Fri. at 1200-1300 hours; Vt. C. D. Nets on 3993 and 3501.5 kc. Sun. at 1000 hours. Several of the boys have sent me AREC applications. Thanks for the new applications. They have been forwarded to our SEC, SIO, of Brattleboro. Ann, OAK, our RM, is working on net certificates for the c.w. gang. You would have had them sooner if it hadn't been for yours truly. I have been kind of lax in getting some of the things done I should have. Various

(Continued on page 90)

# MALLORY HAM BULLETIN



Type "M" 4 Watts

For every amateur  
or professional application . . .

## MALLORY Wire Wound Controls

The year after year continued preference for Mallory wire-wound controls, in amateur handbook and magazine "how to build it" articles, is a wonderful testimonial to the technical skill and ability of Mallory engineering. Continued amateur patronage, plus enthusiastic acceptance by professional users, has made the production of small wire-wound controls at Mallory a highly controlled and uniform process.

The manufacture of high quality wire-wound controls has been a specialty at Mallory almost as long as such controls have been used by radiomen. As a result, practically every style and resistance value needed for amateur or professional application will be found listed in the latest Mallory catalog. There is a style or value for use in just about every circuit around the ham shack—"S" meter circuits, bias control in the cathode of RF, IF, and modulator tubes, excitation level adjustment in crystal oscillators, "T" and "L" attenuators, and all sorts of test equipment circuits, to mention only a few.

For your information and possible help the next time you require a wire-wound control, a few of those available in the latest Mallory catalog are listed and described below.

**"C" TYPE 2 WATT WIRE-WOUND**—This control is one of the smallest capable of dissipating a full 2 watts. It measures only  $1\frac{1}{4}$ " in diameter, and as a result it is a handy control for many bias, "S" meter, and other low voltage applications where physical size is a factor. It features a grounded rotor arm, screw driver slotted shaft, and a full  $266^\circ$  of electrical rotation. Resistance values from 6 to 15,000 ohms are available.

**"R" TYPE 2 WATT WIRE-WOUND**—The "R" control has many amateur applications. Its 1500 volt AC insulation between shaft and resistance element, and its dust proof phenolic case, make this control safe for amateur circuits where high potentials may be encountered. The shaft is a thumb knurled and screw driver slotted stub  $\frac{1}{4}$ " in diameter to which a special 3" extension shaft may be added when desired. The "R" control is made in resistances from 20 to 5000 ohms.

In addition, the Mallory catalog lists a variety of resistance values in "T" and "L" pads. Center-tapped wire-wound controls and units with tapered windings for special service are all available through your nearest Mallory Distributor. See him today for Mallory wire-wounds, power resistors, carbon controls and those other Mallory components you need to keep your equipment in good operating condition.

*In the meantime, watch for the announcement of new Mallory power controls from 25 to 500 watts.*

**"M" TYPE 4 WATT WIRE-WOUND**—This control is the old stand-by used by more amateurs than any other made. Wherever variable resistors of 4 watts or less are required, the "M" control should be the logical choice. With resistance values of 0.5 to 70,000 ohms available it is universally acceptable for voltage division, bias control and test instrument circuits of all kinds.

**"E" TYPE 7 WATT WIRE-WOUND**—The 7 watt "E" control fills the gap between the low power "C", "R", and "M" controls, and the higher power and more expensive units of 25 watts. This control is particularly well suited for use in screen grid and similar circuits where voltage division or adjustment is desired. Nine resistances are available from 5,000 to 150,000 ohms.

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P. R. MALLORY & CO. Inc.  
**MALLORY**

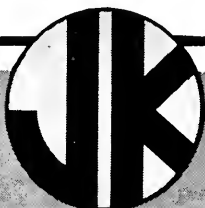
## PRECISION GLASS ENCLOSED CRYSTALS

Crystals of extreme stability, over a complete range of 800 cycles to 5 mc.



(Actual Size)

JK  
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## TEMPERATURE CONTROL OVENS

Small, compact, light, uniform, to complete the environmental control picture. A wide variety available.



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## MILITARY TYPES

Hermetic sealed, metal cased, in frequency ranges from 16 kc to 100 mc.



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- Custom Oscillators, Crystal Filter Networks.
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- Complete customer engineering service provided for quartz crystal applications.



Write for technical catalog

THE JAMES KNIGHTS COMPANY  
SANDWICH, ILLINOIS

certificates sent me for renewal, as well as new appointment certificates, should be in your hands by the time you read this — I said should be! My apologies to all. Traffic: WIOAK 125, AVP 100, RNA 50, 1T 38, BJP 30, KJG 13.

## NORTHWESTERN DIVISION

**IDAHO** — SCM, Alan K. Ross, W7IWU — Kellogg: EC RQG reports that WHZ has dropped the "N" from his call. RSQ's XYL is now WN7ZPP. Ririe: LQU had a nice vacation at Victoria, B. C., visiting VE7s SW, WL, and YU. Gifford: VWS knocked off contacts at the rate of 4 per day during May, with a little 1X like KG1AA, VE8CG, and Greenland on the side. A nice letter was received from FIS, now in Missoula, formerly from Hayden Lake. The rig still is a Bendix TA-12 and an SX-24 receiver. The Hammond organ also is competing with ham radio. Emmett: HOV is the new EC for Emmett and Gem County. TYG still is doing FB with the "Hambone." Boise: DOH is the new EC for Boise. SUZ has a new Ranger and also is working on a radio-controlled model plane. SHN moved to Burley with the CAA. You fellows with QTHs and calls not listed above, please drop me a line. Traffic: W7RQG 25, IWU 6, VWS 2.

**MONTANA** — SCM, Leslie E. Crouter, W7CT — The Billings Emergency Corps is continuously monitoring 3920 kc. from 9 A.M. until 9 P.M. daily except Sun. and holidays. MVN has moved to Glendive to take a new job in the radio phone service for the Mountain States Telephone and Telegraph Co. CT has started construction on his new home in Helena. Les will have a 15- by 20-foot room in the basement finished suitable for his radio shack and also is going to put up a center-fed 80-meter antenna on 60-foot poles. MOF recently moved to Billings and is sporting 160 watts mobile. YLH now is operating s.s.b. GFV is using his new recently-built mobile rig. SMY has a new vertical 44 feet high and is working 40 and 75 meters with it. RDN has a new 2-meter rig. TTC is working for the Yellowstone Park Forest Service this season. LBK is building a new garage 32 by 24 feet. KGF, GFV, and YZQ are redesigning and rebuilding the club rig for the Billings gang. OQI will have the amateur radio booth at the Yellowstone County Air again this year and will have a rig on the air hoping to impress the public by conducting an emergency drill from the fair grounds. Traffic: W7LBK 9, MQI 2.

**OREGON** — SCM, Edward F. Conyngham, W7ESJ — The OO reports indicate many 80-meter Novice operators have not checked for second harmonics — outside the band. ISP advises that the Medford 10-meter Net is drilling each week for AREC work. QCL, MAO, KAB, QVY, SCF, and TMF are all busy building 160-meter rigs. PRA has a new HRO-60 and tape recorder. VBF graduated from high school and now is QRL building a 2-meter rig. TIR reports his dad has dropped the "N" from his call, UXR. VLE still has 12 feet of snow, which is preventing him from doing antenna work. EZR reports the Grants Pass Radio Club held its annual picnic with an estimated 25 mobiles and an attendance of about 95. YET and LNG, from Medford, and FRO, ULR, and DBZ, from Ashland, attended. APF still is battling Tennessee Valley Indians. UZU now has a new 50-foot mast for a beam to go with his one-quarter-mile antenna. UJ and FKS are off for vacation. RIM is off to summer camp and more school. UNY has completed installation of K7WBL. JRU and SBU are heard on 160 meters often. Traffic: W7ZFD 456, APF 252, QKU 129, WLL 114, WAT 75, BVH 39, PRA 33, THX 33, TIR 31, BDU 29, OMO 21, HDN 15, LT 8.

**WASHINGTON** — SCM, Victor S. Gish, W7FIX — SEC: RCM. RM: RXH. PAMs: EHH and PGY. YJE advises that 21 of the boys now are checking in on 6 meters. State Civil Defense is attempting to enlist the services of net members to round out the radio relay system. BA visited 6NCP on a trip to W6-Land. TMO is putting up a 50-ft. Trylon tower and 20-meter beam. PHO still is chasing DX and the boys are razzing him about his fist. WAM is adding lines to his agency representation — Ray and the XYL "Henry" (WN7YQS), regulars at the North Seattle Club. K6BDF/7 is asking about underground antennas to get away from summer QRN. VI is handling traffic on UTL 40-meter schedule. PGY has a new Morrow receiver and converter for his mobile. JPH has a new QTH north of town. CBE built a new "Q" multiplier that really does the work. TWQ reports for the Marysville High School Club. Club equipment was loaned out for the summer to YGL and YHR. The traffic boys are worried about the ban on KA traffic. A new 'phone traffic net is in the offing, covering RN7 territory. FRU is griping about military stations accepting Armed Forces Day traffic for the Far East when traffic was not accepted overseas. OE has the shack completely remodeled with a Ranger, SX-99 and control panel all within easy reach. AIB still is experimenting with antennas. ULK found her Viking trouble. FZB copied 60WP for 35-w.p.m. CP certificate. GAT, as with all publishers, is QRL. RHD is completing the 813 rig, modulated by 811s. LVB is building a big rig with parts from the OM, 6HTN. AVM still is waiting for a break in the weather to get up his 2-meter beam. JEY has a new mobile on 75 meters. UZB is starting a 2-meter net, 145.8 Mc., 8 p.m. Tue. UKI is working on 420-Mc. gear. CWN is DXing on 20 meters. PKR is uranium hunting. ULA built a new

(Continued on page 92)

The **Mosley**  
"Vest-Pocket"

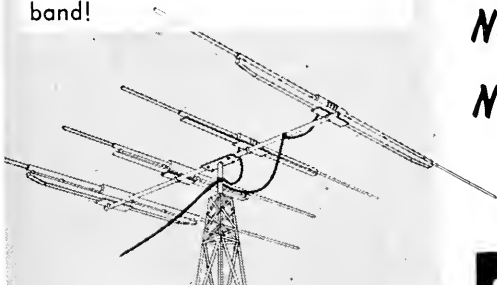
# TRI-BANDER ROTARY BEAM

with **\*AUTO-LECTRONIC** Change-over

✓ **ONE Beam**

✓ **ONE Coax Line**

\*All you do is tune your rig for operation in the band desired. The MOSLEY TRI-BANDER automatically selects the right combination of elements to give True Beam Performance on that band!



The Tri-Bander is a compensated type beam with four elements mounted on one 15' boom. Two elements function for 20 meter operation and the other two for 15 and 40 meter. Because the latter two bands are not in direct harmonic relation, the beam operates at somewhat reduced efficiency at 21 mcs. but gives maximum performance at 7 mcs. and 14 mcs. Forward gain on these bands is 5 db. and front-to-back is 20 db. SWR is 1.1/1 at resonant frequencies. The Tri-Bander is complete with coils, Auto-Lectronic Coupling Yoke and all necessary hardware. Element sections are pre-drilled and color coded for fast assembly.

Model VPA-3B. Amateur Net \$135.00

## **3 BAND OPERATION!**

*No Switching!*

*No Stacking!*

*No Adjusting!*

*just one*

**MODEL VPA 3B  
TRI-BANDER**

*Pre-tuned!*

**15 METER**

**20 METER**

**40 METER**

Hams owning a 20 or 40 Meter MOSLEY "V-P" Beam are invited to write for conversion data. Address Engineering Dept.

Write for your **FREE** copy of MOSLEY Catalog H-55. Describes other popular "V-P" Rotary Beam Antenna Models and products of interest to Hams.

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# NEW for VHF



Operate any frequency in the two meter band! Replace those 8 mc crystals with this compact, easy-to-assemble VFO kit

## JOHNSON TWO METER VFO

Temperature compensated and extremely stable, this compact Two Meter VFO kit is designed to replace 8 mc crystals in most existing two meter transmitters, including types using overtone oscillators. The easy-to-read, edge-lighted lucite dial is calibrated from 144 to 148 mc with 7 to 1 vernier tuning provided . . . output frequency range is 7.995 mc to 8.235 mc and a separate 7.995 to 8.235 mc dial calibration is provided to facilitate calibrating the unit with 8 mc crystals. Power requirements are only 6.3 volts at .3 amp and 250 to 325 volts at 10 ma and may be taken from the transmitter with which the VFO is used. (Power cable and octal power plug are furnished with the unit.) Tube line-up: 6BH6 series tuned oscillator and an OA2 voltage regulator. Dimensions, only 4" x 4½" x 5".

Cat. No. 240-132 Viking Two Meter VFO Kit including complete assembly instructions, tubes and pre-calibrated dial

**\$2950**

Amateur Net

Cat. No. 240-132-2 Viking Two Meter VFO, wired, calibrated and tested with tubes

**\$4650**

Amateur Net



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antenna-tuner which licked most of his BCI. HDT is trying out 2 meters. TIQ is de-bugging the rig, but is active on c.d. and MARS. Traffic: W7BA 1574, PGY 1267, VAZ 866, FRU 569, OE 107, USO 99, APS 89, UYL 59, RXH 51, UIN 46, FIX 21, K6BDF/7 18, W7EHH 16, FWD 16, AIB 14, PQT 14, HDT 10, LVB 10, GAT 9, EVW 6, FZB 4, ULK 4, AVM 3, JEY 2, RHD 2, YJE 2, UZB 1.

### PACIFIC DIVISION

**HAWAII** — SCM, Samuel H. Lewbel, KH6AED — Here is the call for the c.w. gang. Get in touch with your SCM and we'll get an all-islands c.w. net going. Once that is rolling we will arrange for scheduled outlet into the transcontinental system for deliveries into all the states. With 2-meter activity on the upswing 3 OES appointments were made: KH6LD Henry Loo, KH6ZD Lawrence Ching, and OS Tom Hori. LD, mobile on Maui, and AED, on Oahu, made 2-meter history with an inter-island contact. LD is running less than 2 watts output to a ground plane on the roof of the car. Who will be first with the Hawaii-Oahu contact? Traffic: (May) KH6AJF 1895, KA2GE 850, MA 812, AK 538, KR6KS 331, KA2HQ 232. (Apr.) KA2GE 1006.

**SANTA CLARA VALLEY** — SCM, R. Paul Tibbs, W6WGO — SEC: NVO. ZRJ tuned up his antenna and is getting out very well now, thanks to George Grammer's advice. Doc and Ann attended the Pacific Division Convention at Fresno. K6CRN is working on MARS under the call AA6CRN. FON received his license renewal. AIT finished power supply for a new final using a pair of 811s. YHM returned from the East Coast in time to attend the Convention at Fresno. Don left for KL7-Land a few days after returning from the Convention and expects to be in Alaska for about three months. On his return he will be back on the traffic nets again. KIN just finished a 20-meter beam using inductive coupling rings. Others at the Convention were K6BBD, W6HC, WGO, SHK, APV, YPM, FYM, and BPT. ZRJ now is Manager of RN6. Doc should have the net operating on a five-night basis again by the time this is read. NCN needs more stations in Northern California so as to be truly NCN. Stations are needed in Sacramento and up Redding way. Anyone in the Mt. Shasta Area will be welcome. There also is need for a station from the 'phone nets to work on RN6. Traffic, both outgoing and incoming, would then be handled much faster. How about it, gang? Let's make this section again a leader in traffic-handling as it was in the "good old days." Traffic: (May) W6YHM 138, HC 135, ZRJ 67, FON 61, K6BBD 52, W6AIT 39, UTV 36, K6BAM 33. (Apr.) W6HC 95.

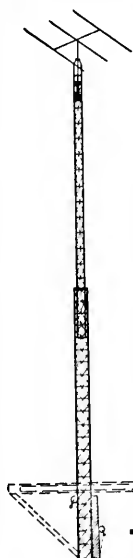
**EAST BAY** — SCM, Guy Black, W6RLB — Asst. SCM for V.H.F.: Ollie Nelson, 6MXQ. Asst. SCM for TVI: Harry Cameron, 6RVC. SEC: WGM. PAM: LL. RMs: IPW, EEF, and JOH. JZ reports he is looking forward with pleasure to a period of relaxing from the duties of office. Maybe he will get some of that equipment built. US now is permanently in Los Angeles. EE is at Zephyr Cove, Lake Tahoe. One of our old-timers, Bud Stedinger, CX, passed away suddenly. LHJ is a very active new Novice in Centerville. The *SARO News* is one of the better and more complete club papers published in Northern California. The East Bay section was well represented at the Pacific Division Convention in Fresno, and assisted the Fresno gang in many ways with the programs. "Operation Alert 1955" saw amateurs participating fully. Several civil defense leaders have gone out of their way to express their full appreciation. ITH has been traveling through a fascinating bunch of DX countries. The Albany Hi-Hi CQers club station, K6EPE, is now an Official Bulletin Station. The East Bay Radio Club heard talks by Walt Serniuk, K6HQE, formerly W2JAR, and Ray Renaudo, W6KEV, in May and June. The V.H.F. Party in June was highlighted by the activity of the V.H.F. Expeditionary Society, which set up equipment at a spot on route 88 known as Ham's Station, California. Traffic: K6GK 125, EPC 24, W6YDI 2.

**SAN FRANCISCO** — SCM, Walter A. Buckley, W6GGC — Asst. SCM: William T. Nakahara, 6GHI. The Sonoma County Radio Club had ALF as guest speaker for its May meeting. Frank gave an interesting demonstration and talk on the tune-up procedure of his beams. LOU's XYL, Mae, is waiting for her Technician Class ticket and K6ITY's XYL, Joan, is awaiting her Novice Class ticket. K6BWQ moved from the Bay Area and has settled down in Eureka, Calif. He is one of the telephone company's salesmen. Members of the San Francisco Naval Shipyard Club held their annual dinner at the El Portal Cafe May 21st. Your SCM had to miss it as the family had tickets for the Fresno Convention. HAMS (the Red Cross Club) had Field Day business and a 6-meter discussion at its May meeting. SDN, KFS, URA, TTB, JAA, CAN, ULA, OJT, PBC, GCG, VWK, VJI, BAZ, YQI, AJF, VSV, BHR, JKN, MXQ, K6s ELV, EGU, ELU, HHL, NCG, APB, BAO, HEZ, and GGC are all listed as 6-meter boys locally. K6ELV now is mobile on that band. Net control for 6 meters is URA, who sports an unhooked-up 829B Tripler final and a four-element beam. Neighbors can't blame him for TVI. Many of the local 29ers Club showed up at Fresno but the 10-meter transmitter hunt signal was not loud enough to be heard by the gang. The 75-meter transmitter

(Continued on page 94)

# Towers! Towers! Towers!

**CRANK UP and DOWN • TILT OVER • HURRICANE PROOF**



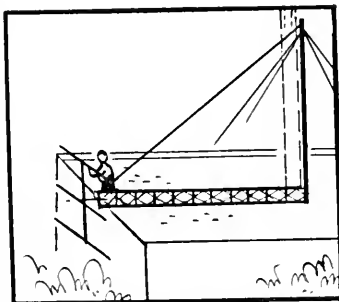
## TILT OVER Ground Post

The E-Z Way Rotary Beam Tower is the answer to a Ham's dream! Tilts over, cranks up and down — and so easy to install. Antenna adjusted in a wink. Ground post is included. You'll find E-Z Way Towers the sturdiest and most versatile towers in the sky.

Six types made from 40 to 65 feet. Each designed for different antenna loads at specific heights. Cranks down and tilts over for easy adjustment. No guy wires needed. These towers are also available with brackets for attaching to building wall at lower prices. No ground post necessary when attached to building.

## FOLD OVER

Three types of Fold Over with gin poles in 40 and 50 foot heights. Cranks up and down. No guy wires needed on tower.



Gin Pole mounting is 20' galvanized structural iron pipe with double hinged base and crank, pulley, cable to crank to perpendicular position. V bracket locks to tower.



Provisions to mount rotor inside top of tower. Bearing at A and B relieves all strain from rotor.

## BUILD IT YOURSELF

20 foot lengths for easy assembly to any heights desired. 320?



### C-10

Width 10"  
Maximum Height 120 ft.  
Guy Spacing 27 ft.  
Weight per ft. 4.5 lbs.



### C-15

Width 14"  
Maximum Height 200 ft.  
Guy Spacing 40 ft.  
Weight per ft. 8 lbs.



### C-25

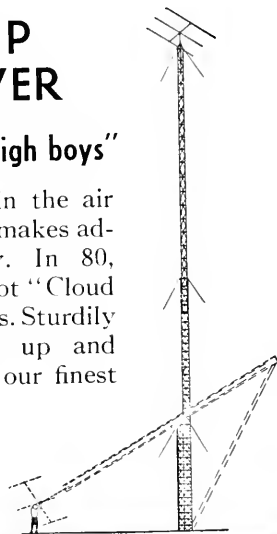
Width 25"  
Maximum Height 320 ft.  
Guy Spacing 80 ft.  
Weight per ft. 20 lbs.

Used extensively for VHF and UHF communications antennas. Two other sizes available. When maximum height and guy spacing are not exceeded, tower will withstand 60 lb. wind load.

## FLIP OVER

"for the mile-high boys"

Gets you up in the air but Flip Over makes adjustment easy. In 80, 100 and 120 foot "Cloud Buster" heights. Sturdily made, cranks up and down. One of our finest towers.



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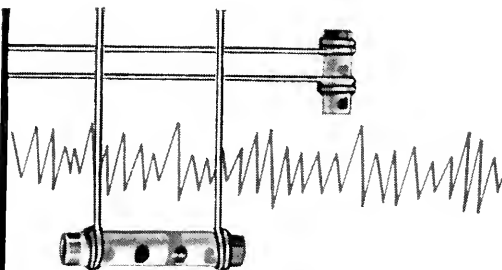
When writing, please specify type of tower in which you are interested, height and expected antenna load.

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hunt was a huge success, though. Wrong-way CTH was last in; they almost sent a search party out to find him. IDF spoke on modern trends in amateur receivers at the U. C. Campus on May 24th. Sorry he couldn't stop over longer and give the same talk to some of the local radio clubs. Sixty-nine members of the Mobilizers held Sunday morning breakfast at the Belmont Motel at Fresno. Mr. Morrow, of the Morrow Co., gave a very interesting talk after breakfast and told the boys how to eliminate some of the mobile transmission noises. OPL's XYL won the main prize at the YL's luncheon. GGC and family enjoyed the Friday night dinner with the Buzzards. There was a grand entertainment after dinner. Dr. Lester Reukema, of U.C., spoke at the May meeting of the SFRC on "Industrial Application of Atomic Energy." The fellows kept him busy answering questions after a very interesting talk. Thanks to ATO for obtaining such a wonderful speaker. BIP was a very busy man in May getting rigs and manpower in line for the SFRC Field Day. YL *Splatter*, the local YLRCSP Club paper, notes new members as K6AIU, W6DHV, and K6BMQ. K6EEE operated her home to YLs, OMs, and jr. operators on May 14th. Even the OMs admitted that they had a grand time. Rae, the 17-year-old YL of GGC, made a "writing date" with some of the boys at Litchfield Pk. and said she should have studied code because Gordon's dad was sending c.w. FVK came back via 'phone so she only heard a one-sided conversation. PHS, the OM of QMO, promises to write some short articles about radio theory for the YL Club. OMO is checking in again with MTN but stays on the American Legion frequency most of the time. AIH lost his way and couldn't even make it in last at the May 29ers hunt. KN6HIW completed a custom-built console for her rig. GQA sent in a most interesting OO report. He gave a frequency check to one of the Mexican stations. He says he expects a lull in activity for the summer months. CBE noted that he had very pleasant visit with the Headquarters gang in Chicago during the recent Elect. Parts Show. Sorry to have to list Dr. Turkel, OVM, on the Silent Keys list. Condolences to his family. Traffic: W6QMO 309, GGC 43, GHI 42.

**SACRAMENTO VALLEY** — SCM, Harold L. Lucero, W6JDN — ASI finished a pair of 4-400As in Lin amp. for his s.s.b. 20-A. JEQ is having trouble with his mobile in the new station wagon. HSB is counting the days until his retirement in August, when he will have full time for ham radio. LLR has his BC-610 TWed and puts out a whale of a signal on 75 meters. MIW has a new Viking Ranger and is planning an amplifier for it. ILZ has another call at his business location, K6KPG, and is running a full gallon. ESZ, master craftsman with a lathe, should see his equipment on all bands. DBA has the TCS mounted in his car and is active on MARS. ROO has the GO-9 on with vertical antenna and is DXing on 40 meters. RNR assumed the prexy job of SARC and is busy on 75- and 20-meter 'phone. QDT, having moved to Modesto, reports he is active on MARS now with 250 watts and a temporary horizontal antenna, and is going on 144 Mc. GDJ is DXing on 20 meters with a new antenna system. AK has returned from an extended trip to Detroit for a new Cadillac and brought back an SSB-20A and a new 75A-4 receiver. GKW is active on 75 meters. MYT is active on MARS and in frequency measuring work. TYC, with CMQ and approximately thirty mobilizers, on June 5th mobilized to Pollock Pines on Highway 50 for a picnic, transmitter hunt, and family day. WUE, new operator at the McClellan MARS station, is active on the American Legion Net on 3975 kc. K6LCY, a ham of years ago, returned to the amateur ranks with a new call. Welcome back. DEO is active in c.d. work. The Convention has passed so now let's look forward to the National Convention that is coming to the West Coast. Traffic: W6CMA 82.

**SAN JOAQUIN VALLEY** — SCM, Edward L. Bewley, W6GIW — SEC: EBL. RM: K6EVM. PAM: WJF. The Pacific Division Convention held at Fresno was a huge success, with an attendance of 752. The gang at Fresno is to be congratulated for a swell job. Word has been received that WJF and FEA are leaving this section and moving to San Francisco. I received a letter from TFD. Eldon is on an LST in the Japanese waters. K6BMM has a Gonset converter and a new dynamotor in the car. ADB has converted a BC-453 to an s.s.b. exciter. Very few reports were received this month, and as this will be my last report as SCM I wish to thank all the gang who have helped me and the section in the last two years. The San Joaquin Valley section has made great strides in organization and activity, and it is all because of the splendid cooperation of the whole gang. K6EVM announces a change in CVN time to 8:00 p.m. Chuck is working hard to keep the section net operating, and would like to see more stations take a part in the net. The section nets are the heart of the National Traffic System, and offer a wonderful opportunity for those interested in c.w. to get in some pleasant operating time. There is room for the beginner as well as the old-timer on the net, and the section net is ideal for the slow operator who wants to increase his speed. Check in on 3525 kc. at 8:00 p.m. Traffic: W6FAE 314, ADB 220, K6EVM 64, W6EBL 21, K6BMM 5, W6WJF 2.

(Continued on page 96)

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Boom Length	16 Feet	16 Feet	12 Feet	12 Feet
Longest Element Length	16 Feet on 20 16 Feet on 10	16 Feet on 20 13 Feet on 15	13 Feet on 15 16 Feet on 10	33 Feet on 40 33 Feet on 20
Forward gain reference to full size dipole	4.8 db on 20 8.8 db on 10	4.8 db on 20 4.8 db on 15	4.8 db on 15 8.8 db on 10	4.4 db on 40 5.6 db on 20
Front to Back Ratio	20 db on 20 25 db on 10	20 db on 20 20 db on 15	20 db on 15 25 db on 10	15 db on 40 20 db on 20
Approx. Weight	30 lbs.	35 lbs.	28 lbs.	48 lbs.
Impedance match	52 ohms on both bands	52 ohms on both bands	52 ohms on both bands	52 ohms on both bands
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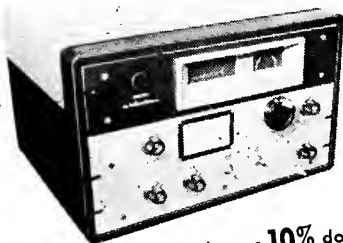
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## ROANOKE DIVISION

**NORTH CAROLINA** — SCM, Charles H. Brydges, W4WXZ — SEC: ZG, PAM: ONM, RM: VHH, CVX has a new HRO-5 receiver and has completed WAC-phone on 20 meters. SOD has a new Viking Ranger and Viking KW plus vertical. The Roberson Emergency Net meets on Wed. at 4:30 on 28,800 kc. ACY reports 22 members on 14 Mc. in the Greensboro Area. The Greensboro 2-meter Net meets at 1800 on 146.88 Mc. BDU reports that his new Vertical worked swell in the CD party. BUA put up a new Windom antenna and had some surprising results on 75 meters. EZ11 is getting his antenna working well on 75 meters with his Globe King. GHQ has his modulator working again plus a new antenna and is having lots of fun. I received only a few reports about a North Carolina traffic net. If any more of you are interested, please drop me a line and maybe we can organize a good net. SOD reports that the Tarnetto Amateur Club has received its notice of affiliation with ARRL. CEN is working Gs and handling messages on 20 meters. The Confederate Teenage Net is meeting on 3950 kc. at 4:00 p.m. for the duration of the summer. YPY is working 40-meter c.w.-phone with good results to W6-Land. ZKE has a new SX-96 receiver and Charlie also is working on a 20-meter beam and a 35-ft. pole for support. BDU, VHH, and WXZ were on for the CD Party and a good time was had. FNV finally got his Globe Scout working and is back on 75 meters. VFK was in the hospital but now is back in the swing and doing FB. FHH has a new single 813 and is doing a good job on 75 meters with about 300 watts. Thanks to all for the fine reports. Traffic: W4BDU 36, DRC 20, WXZ 18, YPY 8, ACY 6, ZKE 6, BUA 4, BUW 4.

**SOUTH CAROLINA** — SCM, T. Hunter Wood, W4ANK — 9JBN/4 reports that K4ADO has a new Globe Scout on the air from Myrtle Beach. YAA has graduated from Clemson and will be on 'phone soon with a BC-696 using screen modulation. LXX reports from Florence that he plans to bandswitch his transmitter, that FGX is receiving rare DX cards and needs only two for WAS, and that AUL, TSU, and LLH were erroneously reported as planning high-power mobile. They are planning high-power home rigs. TSU has almost finished his kw. rig. AUL soon will be on the low end of 20 meters with his half-gallon. On May 13th the Governor signed into law a bill authorizing full-size license plates for South Carolina hams. The amateur plates with calls will be displayed in lieu of regular plates. Regular plates must be obtained but the amateur plates will be displayed. Cost of the amateur plates is \$1.00 in addition to the regular license fee. Novice or commercial vehicles are not eligible. NJG, GQV, HDR, and HMG deserve special mention for successful efforts in facilitating passage of this bill. Principal supporters in the General Assembly were Senators Grant of Chester, Spigner of Columbia, Wallace of York, and Representative Cushman of Aiken. Mr. John Denny, Esq., Columbia attorney, also deserves special mention. Traffic: W4HDR 303, AKC 123, FFI 89, ANK 82, K4ADD 38, W4FML 22, YAA 17, W9JBN/4 3, W4YAA 2.

**VIRGINIA** — SCM, John Carl Morgan, W4KX — SEC: RTV. Reports are gratifyingly plentiful this month. Thanks, gang. PFC and BLR made BPL, Kay's second leg on that medalion. We enjoyed meeting so many at the VFN picnic at HQN's. Details on the Virginia QSO party will appear next month. New clubs include the C. & O. Ry. Employees ARC in the Richmond Area and the Southwestern Va. ARC, with headquarters in Radford. The Tidewater Mobile Club did the usual fine job on the Marathon Outboard Races. The Shenandoah Valley ARC has a fine new club house. The Central Valley ARC is operating an active local net on 29,456 kc. K4NCP is the club station at FADTC Dam Neck. New VFN mgr. YVG is QRL tooting the sax at Virginia Beach. The new VFN asst. mgr. is KZS, ONV continues as secy.-treas. PXA is keeping VN boiling five nights a week through the summer, with newer members "breaking in" as NCS. The younger contingent, including APM, WDZ, TFX, ZFV, and others, say they'll be more active now that school is out. K4ASU is making a net directory of VN/VSN and wants the complete dope on all. There are complaints aplenty on QRM on 4RN's frequency. Welcome to ex-Minnesota SCM, 0EPJ, now 4EPJ. KVM is now KG1JB in Greenland, according to KFC, who snagged MP4QAL for No. 227. ZZL is taking portable to his summer job at Shrine Mont. Squirrels KN4BBR and KN4CAX snagged LU1EK in the Novice band! K4BNI/BNG report activity in the Warrenton Area. K1CQZ and 2JWD/4 are readying 2-meter gear on the Eastern Shore. JUJ is back chasing DX on 20 meters. AAD finally is taming the 833-A final. CWB's big vertical is amusing passersby, who stop to ask if he is "knocking off their ball games." Fortunately he can say no. Traffic: W4PFC 819, BLR 743, AMZ 128, CGE 57, YVG 43, K4ASU 39, W4YKB 33, PXA 29, EPJ 27, WYC 15, K4NCP 14, W4AAD 10, APM 8, TYC 7, WDZ 6, KFC 5, JUJ 4, LW 4, IF 2.

**WEST VIRGINIA** — SCM, Albert H. Hix, W8PQQ — SEC: YPR. PAM: GCZ. RMs: DFC, GBF, HZA, and JWX. The Princeton Club had a good turnout at its recent picnic. It is requested that all hams in the State who can

(Continued on page 98)

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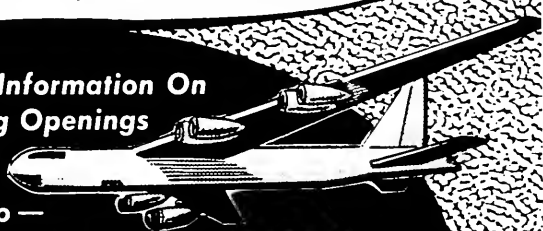
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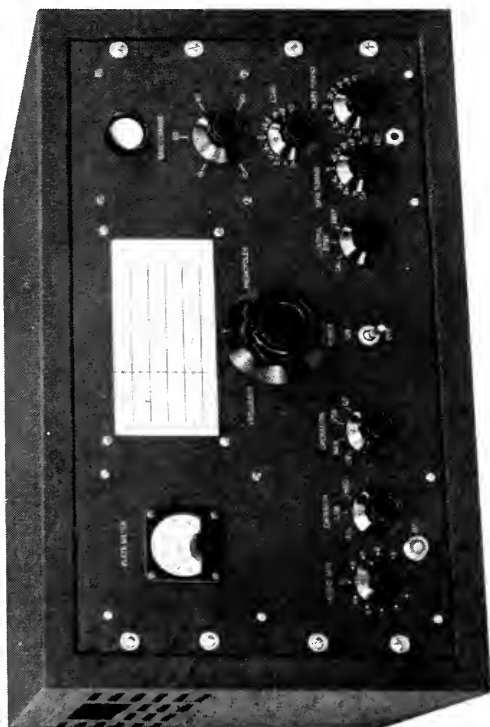
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assist in emergency work, register as AREC members with the SEC and ECS. Please take time now to drop YPR a card in reference to this. IRN just completed a new kw. rig. The Clarksburg Club is enjoying an increase in activity. JWX has a new VFO and rig. BWK is in the process of putting up a new 60-ft. antenna pole. NYH is very QRL now but manages to keep on the air. The West Virginia C.W. Net will operate a summer schedule on Mon., Wed., and Fri., at 7:00 p.m. EST through the month of August. OIC plans to increase power soon. GCN is doing a bang-up job with his s.s.b. rig. TMI also is on with an s.s.b. rig and is becoming quite active after moving from W4-Land. 3LEZ, president of the Frankfort Club, visited PQQ. TDG is very active on the various bands. BDD is heard on 20-meter 'phone often. I would appreciate having more activity information from all the hams throughout the State. CHP and LSG both have Minibeams on 20 meters which work out quite well. Traffic: WSJWX 163, HZA 130, GEP 115, LYN 65, IXG 58, DFC 22, PZT 21, NYH 20, BWK 15, SEV 12, PRT 8, PQQ 7, UYR 4.

## ROCKY MOUNTAIN DIVISION

UTAH — SCM, Floyd L. Hinshaw, W7UTM — The UARC of Salt Lake City is faced with replacement of its president because of the resignation of UKB. Burns advises he has to be out of town too much to do justice to the club. We are sorry to hear he has to leave at this time. SAZ says that Eric has passed his Novice examination but has not received his call as yet. WQC has a new antenna. BED is living in Cedar City but is not on the air yet. QWH is giving the DX boys a chance at a Utah contact, spending about 30 per cent of his time in the DX activity. QDM operated portable from the National Guard's Camp Williams site during the summer-camp period. MWR is trying to work DX but his results include mostly JAs, VKs, and ZLs. QDJ is having modulator trouble so has been on c.w. more than usual. Traffic: W7MWR 14, UTM 3, QWH 2.

WYOMING — SCM, Wallace J. Ritter, W7PKX — DXV is keeping things going on the YO Net on 3610 kc. in fine shape. LPP is doing lots of mobiling on a new job that keeps him traveling. YSF, SDA, TZK, and TZH assist in keeping the Pony Express Net going on week-day mornings. HDS missed on 3920 kc. while on her vacation to the West Coast. ACG/IDO are trying to decide where to operate the rig from, in their new hobby shop or in the front room. Welcome to YJG and his XYL WN7YWY, who swear their jr. operator already is saying his name in c.w. UFB is mobiling in W9-Land while on vacation. AMU recently was promoted to a full colonel in the CAP. LKQ has moved to a new location. NVI moved out of QRM and now has nothing but ducks and chickens to QRM. NVX is attending school in Chicago. IDO and WN7YWY now are members of the YLRL. IWF is getting acquainted with the boys in the eastern half of the section by holding a hamfest of their own. The Sheridan gang still is working on the new c.d. communications site while getting things rolling for the coming Annual Wyoming Hamfest in Buffalo. PMA, new EC, is learning the ropes about antennas the hard way. Your SCM again requests more news and traffic reports via the nets, cards, or letters. Traffic: W7PKX 191, MNW 27, TZK 23, PAV 3.

## SOUTHEASTERN DIVISION

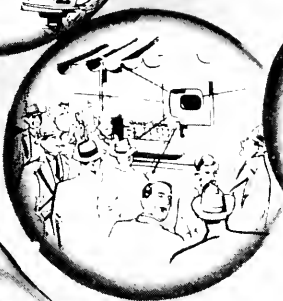
ALABAMA — SCM, Joe A. Shannon, W4MI — SEC: TKL RM: KIX. PAM: WOG. Two-meter activity is increasing around the State with PRS and TLV DXing with super antennas and high power. Reports show that more 2-meter rigs are being built, with indications that before long we will have a section net on 2 meters. COU hopes to have medium power on 2 meters soon and will be joining the ranks. TKL met with the Cocoa Club while on a two-week visit to Florida. The Section Novice Net, which meets Mon., Wed., and Fri. at 1830 on 3720 kc., is well on its way under the guidance of EJZ. How about more Novices calling into AENA? The more the merrier. Welcome to KN4DFU, in Sheffield. A new club is being formed in Cullman with plans being made for final organization. BMM says they have five with advanced tickets and seven Novices as a nucleus. WOG made a trip to east Texas and visited with W6s JMIN, W1J, KPR, and K5AEJ. HKK was voted "NCS of the month" on AENP, while ZSQ took honors as outstanding net member. CAH spent two weeks in Florida and MI and RLG attended the convention in St. Petersburg. Traffic: (May) W4COU 973, UHA 809, WOG 348, HKK 245, KIX 113, YRO 112, ZSQ 106, ZSH 56, K4ACO 48, W4EJZ 46, RLG 21, TKL 19, HYI 12, PWS 9, BMM 8, OR 7, CAH 2. (Apr.) W4YRO 77, OAO 29, PWS 10.

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — Typical of Armed Forces Day activities was that at Jacksonville. UHE, UHY, DSC, WEO, TRN, NKC, HKR, YNY and others plus help from WMBR, WPDQ, and WJHP/TV, accounted for a successful day for the special station in a downtown park. JOCO 2 was great under the direction of IM, our SEC, plus IYT, LFL, EHW, DRD, PZT, BWR, ZBA, HPT, PPH, GFF, DER, KN4CVB, KN4ARV, KN9CYY/4, W8OFX/4, PPR,

(Continued on page 100)

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JZB, PM, and others around the lake area. The State RACES plan is approved. State Radio Officer is UHY and alternates are FWZ and WEO. Lake County: FE reports he and VDY, SXJ, IQJ, and GYB, mobiles, assisted in the Annual Watermelon Festival Parade by shaping it up via radio. The LARA has a Heathkit DX-100. The club call is YKY. Patrick AFB: Armed Forces Day was handled at K4FDC by K4AZA and K4AYX over a 144-Mc. link to the base station. Other operators at the base are IAL and YQC. Equipment includes a BC-610, Collins 32V-2, Collins 51J2, and HRO-50, Ft. Lauderdale: JZB is on 144 Mc. with sixteen elements, Lettine plus Techeratt. YOX runs code classes. IM is on vacation. Lakeland: SCY on 144 Mc. has sixteen elements, Cardwell MOPA, 3E29 final, home-rolled converter into an AR-77, and worked KN4CVC, YZP, and EQN. Lake City: KN4BOS uses a Globe Scout; K4NCS is on at the USNR unit; K4BKV dropped the "N," but KN4DIHK is new. Thanks to YNM at the high school, Miami: New DRC officers are VGT, ERK, WYR, and QLC. Miami wants the ARRL Southeastern Division Convention in '56. Let's help 'em do it, LVV now is DXCCx2! Bird Sparks says the Flamingo Net again will furnish communications for the famed Gold Coast Marathon on July 2nd and 3rd. The Net now has 71 active. Umatilla: AYW uses a Viking II and also is on 50 Mc. with three elements plus 25 watts into a 2E26. Who else is on 6? Traffic: (May) K4FDC 537, W4PUJ 532, WEO 172, BWR 120, YJE 106, IM 85, TRN 84, LAP 74, ELS 71, WS 64, LMT 49, TJU 40, YOX 40, ZIR 40, LVV 35, DSC 33, IYT 33, LFL 33, FSS 31, BZI 26, FE 19, SVB 15, TYE 12, DES 9, EHW 9, WHK 8, FWZ 5, PBS 3, WEM 2, YNM 1. (Apr.) K4FDC 142, W4TJU 122, BWR 113, TRN 6.

**WESTERN FLORIDA**—SCM, Edward J. Collins, W4NS/RE—SEC: PLE, ECs: MIF and HIZ. K4AKP makes BPL for the third month in a row. The Pensacola Hamfest was a huge success. KN4CLJ and KN4CLK are giving the Novice bands a workout. AXP has the big rig perking again. The Crestview Club (CARS) reports the following active: W4CQX, K4BIMQ, K4BNA, KN4BAQ, K4ADM, and KN4BQY. BGG still is looking for room for his antennas. GMS is home from college for the summer. KN4ADY is getting married. KN4AEP is going up for General Class. DAO/DEF is busy helping new hams. CCY is planning a big steel tower for DX. PQW is planning all commercial gear in the shack. PTK-TTM keep their hand in the local nets. NOX still moves the traffic. BFD keeps wee sma' hours. FHQ is QRL work. ACB visited the Pensy gang. UUF is the 144-Mc. DX station for the south. SOQ has gone to LU-Land. W6UQZ is getting on locally. EAR wants more power. HJA has the mobile gear going in the new 12-volt system car. JPD is getting interested in s.s.b. K4BZX is leaving us. KN4AGM is making the hamfests. PLE and his XYL have an FB jr. operator. VR stays loyal to 7 Mc. PAA operates on 7 and 21 Mc. UCY is happy over 10 meters opening up. ZFL does his operating at the PARC Club station. ZPN is teaching a code group. OOW has renewed his ticket. MS is enjoying 5100-51SB unit on 4.0 and 14 Mc. with s.s.b. ODO, JBJ, and EQR all work in the same lab. ZFL is mobile on a bicycle. MUX is in G-Land. RZV still is the big signal in the Dagwood Net. K4ABN has an FB mobile set-up. OKB is working at Saultey Field. Traffic: K4AKP 756.

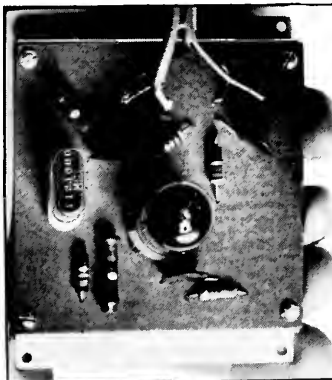
**GEORGIA**—SCM, George W. Parker, W4NS—SEC: OPE. PAMs: ACH and LXE. RM's: MTS and OCG. Nets: Georgia Cracker Emergency Net meets on 3995 kc. Sun. at 0830, Tue. and Thurs. at 1900 EST. Georgia State Net (GSN) meets on 3590 kc. Mon. through Fri. at 1900 EST. More than 425 attended the annual Atlanta Hamfest. YWP carried off the main prize, a Heathkit DX-100. An organizational meeting of the Rebel Net, a state teenage net, was held at the Hamfest. ZPS was selected NCS for the 'phone section, which meets on Sat. at 10:00 on 3885 kc. EDB is NCS for the c.w. session on Sat. at 12:30 EST. WKP presided at the meeting. YRX reports that he will be off the air for a few weeks—he is acquiring a new XYL. The Georgia State Net needs outlets in Columbus and Valdosta. How about it, some of you brass pounders? BWD is working on a mobile rig. MA is back on the air after a slight illness. MNJ has been in the hospital at Ft. Benning. BXV now has Vermont for his 48th state on 40-meter c.w. with 50 watts. HAO and OPE are now mobile. Among those from the Atlanta Area attending the Southeastern Division Convention in St. Petersburg were ZD, NS, OPE, WKP, MV, and TO. A new club is in the making at Ft. Benning. Officers will be announced later. Traffic: (May) K4WAR 2103, W4OCG 564, BVE 379, PIM 279, DDD 228, HYV 73, CFJ 56, YTO 44, MTS 28, NS 28, BWD 26, IMQ 24, ZD 22. (Apr.) K4WAR 718, W4ZUF 68, IMQ 36.

**WEST INDIES**—SCM, William Werner, KP4DJ—AAB received OES appointment and is putting up a 6-meter beam. ACF is on 3736 kc. ABA has obtained his General Class license. UY, transferred back to KP4 by the Navy after a year's absence, uses Viking II and VFO. UT is transferring to the States in August. MV's ART-13 changes tone on c.w. Amateur emergency communications were praised by the c.d. chief and space in the Rio Piedras Building was offered and accepted by PRAC. At present

(Continued on page 102)



**HOW TO ORDER:** In order to give the fastest possible service, crystals and oscillators are sold direct. Where cash accompanies the order, International will prepay the postage; otherwise, shipment will be made C. O. D.



## FO-1 PRINTED CIRCUIT OSCILLATOR

For Generating Spot Frequency Signals with Guaranteed Tolerance  
1000 KC to 15,000 KC fundamental operation

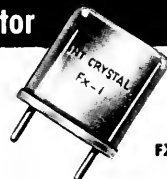
Since the operating tolerance of a crystal is greatly affected by the associated operating circuit, the use of the FO-1 Oscillator in conjunction with the FX-1 Crystal will guarantee close tolerance operation. Tolerances as close as .001 percent can be obtained.

FO-1 —Oscillator Kit (less tube and crystal)..... \$3.95  
FO-1A —Oscillator, factory wired and tested  
with tube (less crystal) ..... \$6.95

## FX-1 CRYSTAL Companion to the FO-1 Oscillator

The FX-1 Crystal is designed for use only with the FO-1 Oscillator. For tolerances of .01% and .005%, any FX-1 Crystal can be used with any FO-1 Oscillator.

For tolerances closer than .005% the oscillator and crystal must be purchased together. The oscillator is factory wired, and the crystal custom calibrated for the specific oscillator.



FX-1

Tolerance	1000-1499 KC	1500-1999 KC	2000-9999 KC	10,000-15,000 KC
FX-1 .01%	\$5.25	\$3.75	\$2.50	\$3.25
FX-1 .005%	\$6.00	\$4.50	\$3.00	\$4.00
( .0025% and .001% tolerances are available only by purchasing the FO-1 Oscillator and Crystal together )				
FX-1 .0025%	\$6.75*	\$5.25*	\$3.75*	\$4.75*
FX-1 .001%	\$8.00*	\$6.50*	\$5.00*	\$6.00*

\*Prices are for crystal only. To insure this tolerance crystal must be purchased with oscillator factory wired and tested. For total price add \$6.95 to price of crystal desired.



## ONE-DAY PROCESSING FA-9

FA-9 Spot Frequencies 1500 KC to 75 MC .01 %

**.01% TOLERANCE**—Crystals are all of the plated, hermetically sealed type and calibrated to .01% or better of the specified frequency. See specifications below:

**Holders:** Metal, hermetically sealed, available in .093 dia. pins (FA-9) or .050 dia. pins (FA-5).  
**Calibration Tolerance:**  $\pm .01\%$  of nominal at 30° C.

**Temperature Range:** -40° C to +70° C.

**Tolerance over temperature range** from frequency at 30° C  $\pm .01\%$ .

**Circuit:** Designed to operate into a load capacitance of 32 mmf on the fundamental between 2000 KC and 15 MC. Designed to operate at anti-resonance on overtone modes into a grid circuit without additional capacitance load. Write for recommended circuits.

Orders for less than five crystals will be processed and shipped in one working day.

## PRICES FA-9\* (Pin Diameter .093)\*

Pin Spacing .456 (\*FA-9 fits same socket as FT-243)

RANGE	TOLERANCE	PRICE
<b>Fundamental Crystals</b>		
1500-1799 KC	.01%	\$4.50
1800-1999 KC	.01%	\$3.90
2000-9999 KC	.01%	\$2.80
10000-15000 KC	.01%	\$3.90
<b>Overtone Crystals</b>		
(for 3rd overtone operation)		
15 MC—29.99 MC	.01%	\$2.80
30 MC—54 MC	.01%	\$3.90
(for 5th overtone operation)		
55 MC—75 MC	.01%	\$4.50

## For Commercial Use F-6 Series 1000KC to 60MC

ONE DAY SERVICE

Wire mounted, plated crystals, for use in commercial equipment where close tolerances must be observed. All units are calibrated for the specific load presented by equipment.

**Holders:** Metal, hermetically sealed.

**Calibration Tolerance:**  $\pm .0025\%$  of nominal at 30° C.

**Tolerance over Temp:**  $\pm .005\%$  from -55° to +90° C.

**Range:**  $\pm .002\%$  from -30° C to +60° C.

Send for FREE Catalog covering Crystals available from 100 KC International's complete line. to 100 MC.

**Circuit:** As specified by customer. Crystals are available for all major two-way equipments. In most cases the necessary correlation data is on file.

**Drive level:** Maximum—10 milliwatts for fundamental, 5 milliwatts for overtone.

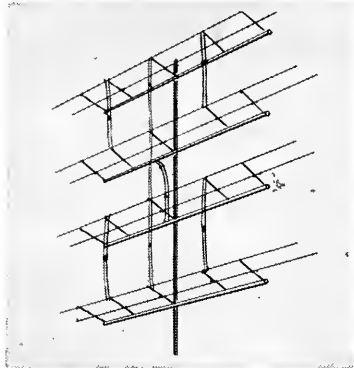
F-605	F-609	F-612
Pin dia. .050	Pin dia. .095	Pin dia. .125
Pin length .238	Pin length .445	Pin length .620
Pin spacing on each of above is .086		



F-605

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8 element beam .....	\$12.50
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32 element beam .....	37.50

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RACINE, WISCONSIN

a TBS-50 is installed and operating on 3925 kc. AAC and AAO are using s.s.b. ES has a five-element Telrex beam on 20 meters. The Antilles Net now receives weather from Aruba PJ2AO. ACB, located on top of a mountain near Castañer, uses emergency power at all times and reports weather to the Antilles Net for the USWB. DH is trying 'phone since he obtained a Viking II. DV uses an electronic T-R switch for break-in. NY is leaving KP4 for another church assignment in the States. CO suggests a hidden transmitter hunt. HZ, MV, CN, and QA appeared on a 30-minute TV show explaining amateur radio. KD and his son BJ attended the Southeastern Division Convention in St. Petersburg, Fla. WT reminds us that she guards 3925 kc. all day from 7 a.m. to 10 p.m. RK/mobile had a 'phone patch with his father through MV from Mayaguez to San Juan. AZ is putting up a 40-ft. vertical. QR is practicing with a Mon-Key. Traffic: KP4WT 140, DJ 2.

**CANAL ZONE** — SCM, Roger M. Howe, KZ5RM — Acting SCM: P. A. White, KZ5WA. W4UEL and W4DIR came down from Miami to listen to Stateside QRM and visit friends on this end of the QSOs for a change. KZ5BD and DW gave a party for club members at their home after the CZARA meeting in May. KZ5, "Very Romantic" (Virginia) is now on the air. She conducted a very fine code class for CZARA for the last 12 months. The theory class, held the same period, was conducted by KZ5s GD, BD, RM, and FL. RM (also W6OYA), our SCM, is now visiting Stateside and will see W9PNF, ex-KZ5WJ. GD and DG, also in the States, are operating as W0WXL/mobile and W0DLU/mobile. WZ has a new s.s.b. rig on order for 20-meter operation. Three cubical quads were used for 10, 15, and 20 meters under the Field Day club call KZ5KZ, at Gamboa, on June 18th and 19th. Field Day plans were in the hands of RV and CF. Traffic: KZ5WA 153, KA 50, HA 45, VR 16, JJ 15, VZ 9.

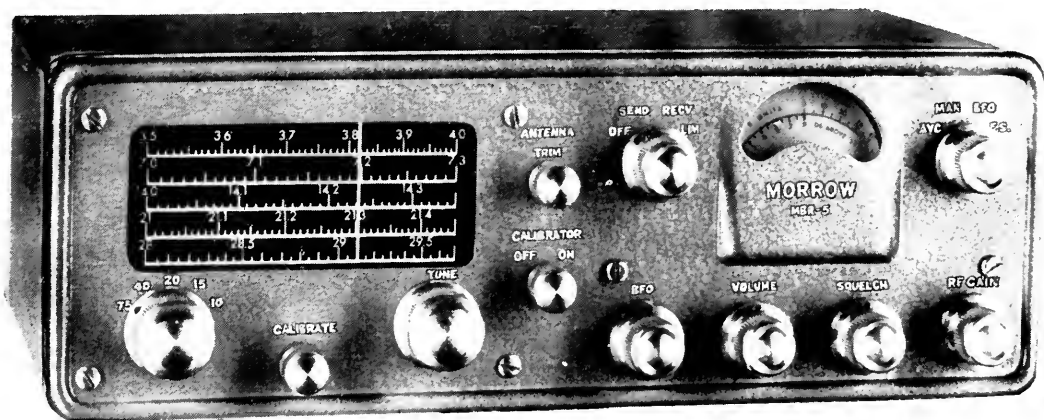
## SOUTHWESTERN DIVISION

**LOS ANGELES** — SCM, William J. Schuch, W6CMN — SEC: QJW. RMS: BHG, GJP, and K6DQA. PAMs: PIB and YVJ. The Eagle Rock Teen Age Club is now an affiliated club and the club call is K6LBZ. BES now has a full gallon and a 7-Mc. beam. CBO is putting up a V-32 antenna. K6BFC worked ZD6BX on 7 Mc. with his new 500 watts. BUK has a tower now and an Elmac receiver for the car. New members of the Pacific Club are K6GCN, BFC, CEO, and W6UED. K6EJT is QRL traffic and makes BPL. Congrats. HIF checked into SCN from Portland, Ore. NJU finally made it into Europe, 7 countries in two nights. FB, WT is having fun on 144 Mc. KN6JRY sports a new Harvey Wells. K6EXV is corr. secy. for the L.A. YLRL. KN6KDJ has moved to Washington. K6DQA, W6USY, CMN, GJP, and GYH, all of SCN, attended the Convention in Fresno and all report a swell time. The June '55 *Ford Times* has a nice blurb for ham radio. Among the new Novices in the section are KN6LHA and LML. Congrats. New officers of the San Fernando Valley Radio Club are YSK, pres.; K6ARM, vice-pres.; K6BAU, secy.; K6EIA, treas.; K6KXT, membership; W6UEI, program; and K6EVT, refreshment. FKZ has GP antennas on 7, 14, and 21 Mc. K6JHR has new SX-99 and Viking Adventurer and has just put up a 7-Mc. GP. K6BFC finally is back on the air and also has a new 21-Mc. beam. KZ2BE paid a visit to the shack of GYH. ORS won a Communicator at the Fresno Convention. CMN has new twin Yagi 5 on 144 Mc. BHG is QRL with traffic skeds and OBS duties. K6DQA is the new manager of the Southern California Net. Don't forget the San Diego Convention, Oct. 1-2. It is with regret that we report the passing of Harold F. Wood, QVV, June 7, 1955. Traffic: (May) K6EJT 530, W6USY 284, GYH 279, K6DQA 153, W6BHG 146, WPF 129, CMN 122, CAK 104, CK 64, KN6HOV 59, K6COP 51, BWD 23, W6YVJ 23, HIF 19, GJP 14, WT 12, ORS 11, K6ELX 10, BEQ 8, W6CBO 8, NJU 2, EUD 1. (Apr.) K6BFC 136.

**ARIZONA** — SCM, Albert H. Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH, and Dr. John A. Stewart, 78X. SEC: YRB. PAM: KOY. The Arizona 'Phone Net meets Tue. and Thurs. at 7 p.m. MST on 3865 kc.; the Arizona C.W. Net Tue. and Thurs. at 8 p.m. MST on 3690 kc. The outstanding event of the month of May was the Annual Montezuma Well Hamfest, which was bigger and better this year than in all previous years. There were approximately 275 persons present, representing 75 calls and 48 mobile installations. Those who attended were W7s BFA, DJH, DRQ, EAW, HGI, HYQ, JKY, KAD, KAE, KCB, KOF, KOY, KUJ, KWB, KXT, LEE, LJJ, LSK, LXX, MAE, MDD, MBS, MWQ, NAP, NEL, NTK, NUL, NYN, OAS, OIF, OPY, OQS, OUE, PAC, PIY, PMQ, PZ, QHD, QWI, RFE, RIJ, SIP, SNI, SX, TJT, TLY, TNY, TPL, UBT, UCA, UDI, UPQ, USM, UXK, UXZ, VKO, VXX, WKM, WNN, WUX, WYY, YFG, YLR, W5s BQU, MTO, W6s DFL, EAL, EL, EWW, EXB, IZS, PIB, W9ANA, W0UEN, and VE3DVO. We regret to announce the passing on May 29th of JFG, Nap Trembley, of Tucson who was professor of French at the University of Arizona. WUG made BPL with 154 originated messages. LVR received his Maritime Mobile certificate. The Ft. Huachuca ARC's hamfest plans are complete for Sept. 3-4-5. 4CMC

(Continued on page 104)

# New MORROW Receiver



## COMING SOON!

The NEW MORROW MB-560 MOBILE TRANSMITTER designed to match the NEW MORROW MBR-5 MOBILE RECEIVER. 5 bands—VFO—60 Watts. Modern compact design. 4 inches high x 11 $\frac{3}{4}$  inches long x 6 $\frac{1}{2}$  inches deep. SEE IT IN QST NEXT MONTH!

Now MORROW engineers have teamed up to bring amateurs a superb new mobile receiver, the MBR-5. The MBR-5 is a complete 13-tube dual conversion superheterodyne communications receiver built to afford greater versatility, easier installation and added operating convenience. All the fine workmanship and dependability of Morrow engineering and manufacturing processes are built-in in this new receiver to offer better performance and more value than anything offered to amateurs before. Compare MORROW specifications! SWITCH TO MORROW TODAY!

**HIGH SENSITIVITY**—Better than  $\frac{1}{2}$  microvolt sensitivity assures hearing practically any signal. This feature combined with excellent signal/noise ratio makes signals readable that are ordinarily lost.

**100 K.C. CRYSTAL CALIBRATOR**—Now, for the first time, MORROW has made it possible for amateurs to read exact frequency on mobile receivers. Assures high reset accuracy.

**SSB AND CW RECEPTION**—Excellent SSB and CW reception is assured due to the inherent stability of the MBR-5. No warm-up delay. Fully temperature and voltage compensated oscillators. Will hold calibration accuracy with changes of 0 to 150 degrees F. and input voltages of 4 to 8 volts, DC.

**ECONOMY PRICED**—\$224.50 complete with 6-12 volt DC power supply, MORROW SH type PM speaker, operating instructions and mounting hardware. Physical size: 4 inches high, x 11 $\frac{3}{4}$  inches long, x 6 $\frac{1}{2}$  inches deep. PW-115, for fixed station use: \$29.95.

**SQUELCH AND NOISE LIMITER**—The exclusive new MORROW Noise Balance Squelch completely eliminates interstation noise but will readily open on weakest signals. The improved series gate noise limiter is extremely effective in eliminating pulse noises.

**ILLUMINATED "S" METER**—Measures incoming signal strength and used as a field strength meter for adjusting mobile transmitters to maximum output. A must for mobile amateurs.

**NO SPURIOUS RESPONSE**—Excellent RF design eliminates images and spurious responses. Bothersome broadcast break-through and oscillator harmonics suppressed.

**HOME STATION OR ANY AUTO**—Power supply operates on both 6 and 12 volts. 120 volt AC power pack available for fixed station operation. Accessory socket on power pack to supply low voltage stages of the MORROW MB-560 Mobile transmitter.

**TUBE LINE-UP:** 6BZ6 RF—12AT7 mixer, osc.—6BJ6 IF—6BE6 mixer, crystal osc.—6BJ6 IF—6T8 det., BFO—6AL5 noise rect.—6AL5 noise limiter—12AX7 audio amp., squelch—6C4 audio amp.—6AQ5 audio output—6BJ6 crystal calib.—12AT7 noise amp., "S" meter.



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Now Bud offers 4 new sizes in our Sloping Panel Cabinets. With 9 sizes now in this line, there is sure to be a size to fit your need. In addition, there are quality bonuses like the exclusive Bud hinged top providing easy access to components . . . and there's more — you can have light grey hammered finish at no extra cost.

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The following Bud products are also available in light grey hammered finish:

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says overnight camping facilities can be had at Garden Canyon, also there are motels; civilian planes can use the Army air strip if Army is released from responsibility. Traffic: (May) W7LRU 46, WUG 17, (Apr.) W7WUG 182.

**SAN DIEGO** — SCM, Don Stansifer, W6LRU — The big news of the month is the coming Southwestern Division Convention, sponsored by the San Diego Council of Clubs, on Sept. 30th, Oct. 1st, and Oct. 2nd. The officers of the Council are ODR, chairman; GBC, vice-chairman; SEC, secy.; and BPK, treas. WYA is chairman for the Convention. CRT has added 10 new countries recently, including VS6, YO, SM, KGI, OE, KC6, SP, VP4, PA, and Trieste. KN6LIR is a newcomer to Pt. Loma. OME, ex-TA3AA, is home again, and working DX with his kw. rig. New officers of the YLRL are: Mary Poe, pres.; Kathleen Kreysler, vice-pres.; Isabell McKenney, secy.; Billie MacDonald, treas. HIL has a new 75A-4. K6LKG now is living in Vista. KVB is mobile in his new Ford on 75 meters. HAW is mobile all bands and anticipating a trip to Iowa. HTN is angling for a Johnson KW rig. The Palomar Club has been reissued its old call, NWG, and used it during Field Day. K6AWW is now in Carlsbad. BZE and KSM are building new all-band finals. CHV and LRU were among the first 5 W6s who worked VS4CT when he started operating from Sarawak on 20-meter phone. CHV also worked him from Brunel. The local DX gang is very active again with improved conditions. LRU is now at 199 countries, with HK0AI, YJIDI, VS4CT, and ZD6BX. ODR and his XYL flew to England for a vacation in June. It is hoped that the entire gang will pitch in and make the coming Division Convention as successful as those in the past have been. SYA has a new twin-five beam on 144 Mc. Traffic: W6IAB 3257, YDK 825, IZG 262, K6DBG 44, W6FMZ 7, KVB 6.

**SANTA BARBARA** — SCM, William B. Farwell, W6QIW — Santa Barbara AREC is well organized and conducts c.d. drills on regular skeds. Our hats are off to Ventura and Oxnard AREC for their FB c.d. work, also. K6BVZ and W6FFF are on 6 meters. TMI has worked over 45 states on 6 meters. K6KXB now is General Class. BQP is rebuilding. PKC, IHD, ZRR, and QHC are on s.s.b. The mortality rate of Novices is only 3 per cent in this section. Code classes are conducted by the Santa Barbara, Ventura, and Oxnard Clubs. K6KPU and W6SRI check in regularly on ALN. ENR is mobile with a Viking Ranger. QIW, MSW, IGH, and ENR were among those attending the Pacific Division Convention at Fresno. The Tri-County Net, on 3820 kc. at high noon is very active. PQJ holds skeds with his son in college. ENR and NKT are very active OOs. State College hamis active on 3995 kc. are K6AYC, ALP, W6BIN, SLR, and EJO. Traffic: K6NBI 387, W6REF/6 89, QIW 70, K6KPU 6, W6FYW 4, K6ASB 3, W6DTY 2, ENR 2, SRI 2.

## WEST GULF DIVISION

**NORTHERN TEXAS** — SCM, T. Bruce Craig, W5JQD — SEC: RRM. PAMs: PAK and IWQ. RM's: PCN and QHI. The Midland Amateur Radio Club has been accepted as an ARRL affiliate. ACK is mobile with 12 watts. AHC is rebuilding his rig. HKF has moved to Brownfield, leaving an opening for EC in Seagraves. MBP reports for the Blue Ridge 160-meter Net, which held a picnic at Lake Lavin on Apr. 24th with 32 present. The Net meets on 1880 kc. at 0800 each Sun. with 86 per cent attendance for May. CZZ, DBE, DNZ, LVP, MBI, MBP, QFK, and GES have mobiles on 160 meters. LGY reports that she is on 40-meter phone and c.w., that HDM went to work for WFAA at Grapevine, and that AFY has a new daughter. WXY is president of the Texas YL Round-up Net; W5SYL, vice-pres.; LGY, secy.-treas.; ZPD, pub. chairman. APK is a new member of NTEN. FIR is putting up a new vertical on 75 meters. The Temple Amateur Radio Club was alerted and assembled at the Police Station on a stand-by basis on May 6th at 1819 hours after a tornado wind demolished a part of the city. The amateurs furnished the power units used at the scene of the disaster until relieved by the National Guard. Stations participating were VIF, SBS, CHF, JIB, WDW, PNP, UPO, VHF, DXD, and numerous other fixed stations as well as some of the XYLS. Fort Worth hamis were guests of the Southwestern Bell Telephone Co. on Apr. 21st for a tour of the exchange office. ONQ has code classes going; he operates on 40 meters because of difficulty in antenna length. Traffic: K5FFB 2052, W5DTA/5 999, KPB 523, FJB 298, UBW 156, AHC 149, PAK 127, ACK 81, PCN 54, CF 50, FCX 27, ASA 16, LGY 10, HKF 8.

**OKLAHOMA** — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Canady, 5GIQ. SEC: KY. RM: GVS. PAMs: PML, SVR, and ROZ. The most notable event of the month was the North Fork Hamfest at Quartz Mountain State Park. West Gulf Division Director CF gave a fine talk and enjoyed himself. He won over RST as the oldest ham present. BIE was not satisfied with climbing roofs daily putting up TV aerals but had to climb the mountain with the kids. Sorry to report that the change in the license plate law did not pass as it started too late and got lost in the shuffle in the closing days of the session. Amateur radio again demonstrated its readiness to serve in an emergency when a tornado hit Blackwell. The tornado warning net had been following the squall line from Southwest Oklahoma

(Continued on page 106)

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Transmitter-Receiver  
with Dual Power Supply

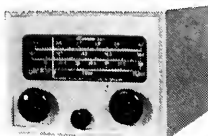
Model	Band	Power Source VDC or VAC
3025	2-meter	6 110
3057	2-meter	12 110
3049	6-meter	6 110
3058	12-meter	12 110

Complete with tubes  
(less crystal and mike)  
each **\$22950**

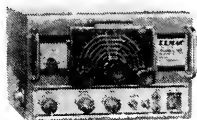


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5-Band  
Converter  
**\$7495**



## ELMAC AF-67



Trans-  
Citer  
**\$17700**



## PALCO BANTAM 65 MOBILE TRANSMITTER

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Complete with RF unit, speech amplifier and modulator (with tubes and connectors) **\$15950**

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Operates as 10 meter antenna when used without coils. When used with coils permits operation on all bands. Two sections come apart easily for inserting and changing loading coil. Each coil is retuned to an extremely high Q.

Antenna (less coil)	<b>\$6.86</b>
75 meter coil	<b>6.81</b>
40 meter coil	<b>6.81</b>
20 meter coil	<b>6.81</b>



Model 73-E

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Citizens 2-Way Radio

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Central Station Power Pack for 115 V. AC **34.65**

6 and 12 volt DC Power Packs (specify 6 or 12 volts) each **31.00**



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Conversion—  
10  
Tubes



Model PMR-6A  
Model PMR-12A

for 6 volts  
for 12 volts

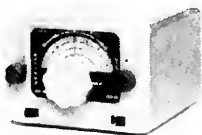
Complete with tubes (less power supply) each

**\$13450**

POWER SUPPLY 6 or 12 volts **\$2450**

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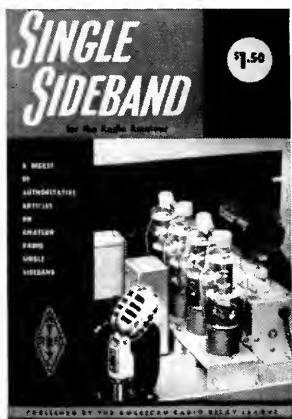
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for several hours with several funnels sighted and many communities alerted. Luckily HFV's QTH was not hit and power was still on so help was on the way in short order. EC LWJ was in Tulsa but got over the next a.m. with emergency gear and handled many messages, most of which were welfare. Others in there soon were GIQ, MFX, 9PHR, and CXM, who spent many hours helping with the traffic. Traffic: (May) W5GVS 410, IWJ 220, LX 156, PML 96, MFX 73, SVR 70, QAC 61, KY 58, PNG 56, FEC 44, JXM 38, RST 38, CBY 34, HCG 33, TNW 33, ADC 31, FU 19, CXM 18, MQI 17, MCG 14, CFG 13, UCT 12, GXH 11, CYQ 10, EHC 10, PAA 7, TKC 4.

**SOUTHERN TEXAS** — SCM, Morley Bartholomew, W5QDX — Members and guests of the South Texas Emergency Net met at Kerrville May 27-29 for their tenth annual convention. General chairman BEO and all the Kerrville gang really put on a swell show. New Net officers are CWS, nc; RKL, alt, nc; LRK, secy-treas.; JHW, pro, Zone 1: EV, ze; ONG and TVK, alt, ze; MSA, pro, Zone 2: RWS, ze; WYK, alt, ze; AUM, pro, Zone 3: EJT, ze; WXT and DKK, alt, ze; WIS, pro, Zone 4: AUO, ze; NZH and CRA, alt, ze; SZB, pro, Zone 5: SJL, ze. The C.W. Net is headed by FIW, nc; MJN, alt, nc; EV, NSA, TEL, QKF, QEM, and LMU were seen greeting old friends at the convention. The Red Cross at Mission held a simulated disaster on March 6th. Valley amateurs who participated were PBD, base station, FZO, SZB, PBU, NZH, AUO, PAR, LKJ, AET, NVQ, TVL, ASI, DNX/5, and K5NCJ. The Rio Grande ARC has started code classes. YRI has moved to Donna and has a new Globe King. BVZ and BWT are on 75 meters. The CCARC furnished communications for the Padre Island Walkathon, the 110-mile contest from Pt. Isabel to Corpus Christi. Everyone got lots of experience in message-handling. AQK, HQR, and PMT spent three nights on the Island with the walkers, and all club members worked shifts at the Corpus Christi end to get the messazs through. The Club also furnished communications for the Buccaneer Day Celebration. The Austin Naval Reserve Unit is starting code and theory classes for beginners. PRO is operating portable from Rockdale this summer. Traffic: (May) W5MIN 381, TFF 34, (Apr.) W5TFY 62.

**NEW MEXICO** — SCM, Einar H. Morterud, W5FPB — SEC: KCW, PAM: BIW, V.H.F. PAM: FPB. The NMPEX meets on 3838 kc, Tue and Thurs, at 1800 MST, Sun, at 0730, the NM Breakfast Club every morning except Sun, 0700-0830 MST on 3838 kc; the NM C.W. Net daily at 1900 MST on 3633 kc. We regret to announce that GYN has joined Silent Keys. New officers of the Pecos Valley Radio Club are ZU, pres.; ARD, vice-pres.; DZB, secy-treas.; COS, act. mgr. The Albuquerque V.H.F.-U.H.F. Radio Club has been organized with the following officers: FAG, pres.; VWU, vice-pres.; FJE, secy-treas.; ECS, act. mgr. The Club has been holding drills with c.d. message center personnel. CEE is the new State MARS Director. CZT has a Gonsel Communicator II. QHB is on 2 meters from Los Alamos. The following furnished communications for the auto races held at Fort Sumner: KN5AOS, W5CZT, FVY, CXU, JAU, LEF, NSN, OAI, PDY, PKL, UAF, UCN, UWA, and VDY. The Navy has called UEO to sea duty. A total of 203 registered at the State Hamfest held in Albuquerque sponsored by the Amateur Radio Caravan Club. John Reinartz, K6BJ, was speaker. The pre-registration prize, a complete mobile station, was won by W5WFR; registration prize, an SX-99, was won by W5KNU; K5WSP and K5PEF made BPL in May. Traffic: K5WSP 1222, FEF 351, W5RFF 131, QR 18, ZU 18, BZZ 16, JZT 13, UAR 7, HOE 4.

### CANADIAN DIVISION

**MARITIME** — SCM, Douglas C. Johnson, VE1OM — Asst. SCMs: Fritz A. Webb, 1DB; Aaron D. Solomon, 1OC. SEC: RR. New appointees are AEB as OPS, AAY as ORS and OPS, and QZ as OES. JT is active from Grand Manan. Joe is ex-VE2ANR. BN and W3TWO/VO1 were recent visitors to Halifax. W4STY/VE1 is active from Shelburne. Hats off to those amateurs who monitored 75 meters, and were well-prepared for any eventuality during the recent bad outbreak of forest fires. WB, NBARA president, reports two successful c.d. exercises in which N.B. hams took part. Apparently civic officials of Fredericton were very impressed. Mobiles VO1T, AE, B, AO, 2I, W9WIA, W4WOU, and W0MTZ participated in the Cancer Drive canvass. VO1AB was control station. The recent hidden transmitter hunt was won by mobile VO1AE. Others taking part were W4WOU and VO1s T, AO, B, and AB. VO1D/2 was the hidden transmitter call. The Newfoundland Radio Club executives are VO1AO, pres.; W0CZK, vice-pres.; W5RPI, treas.; VO1D, reflected secy. W7SNR/VO6 reports a posting to K1H6-Land. VO6AM, the XYL of VO6U, is a new ham in Goose. Ex-W4KVM/VO6 is now K6LIB in Greenland. VO6AB is active on 20- and 75-meter 'phone. VO6U has worked 124 countries to date. Traffic: (May) VE1FQ 85, VO6B 146, VO6AH 96, VO6U 81, VE1AV 49, OC 47, DW 13, UT 40, VO6AM 15, VO1D 12, VE1OM 10, AEB 9, VO1T 8, VE1GA 7, DB 2, ABZ 1, WB 1, WK 1. (Apr.) VE1WK 6.

**ONTARIO** — SCM, G. Eric Farquhar, VE3IA — We record with regret two Silent Keys. Grant Salla, an ardent

(Continued on page 108)



Leo. E. Meyerson  
W0GFQ

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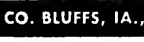
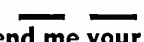
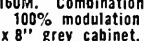
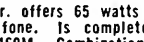
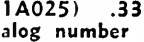
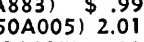
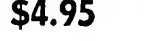
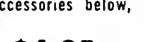
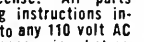
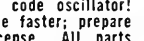
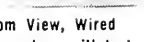
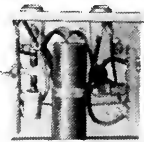


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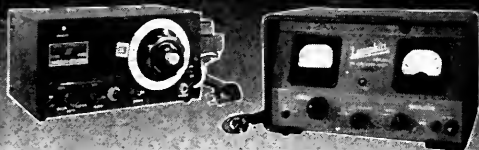
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SWL of Nortown Club, Toronto, was killed in a motorcycle accident and Bob Hare, VE3CRH, was killed in a bicycle accident near Smith Falls. The latter did much valuable work during the past two winters as a member of the St. John Ambulance Ski Patrol in Ottawa. Deepest sympathy is extended to both families and the Nortown and Ottawa radio clubs. On the loss of his mother we also offer our condolences to BNQ, of Hamilton, DTO is Class A. Two members of Nortown were recognized for splendid showings in the last Sweepstakes. DRD won the Captain Morgan Trophy for c.w. operation and BVI the Albert Bickerton Cup for "phone. AOE is rebuilding. ATR is greatly missed in traffic circles and the gang is pulling for Reub in the hopes of improved health. AJR reports a fine time at the Oshawa Banquet. The Roblin Amateur Radio Club of Toronto is a recent ARRL affiliated club. New officers of the Ottawa Club are BCU, pres.; CMW, vice-pres.; AXL, secy. CCO is heard on 50 Mc. AYE, formerly G3AAU, is heard on 14 Mc. BMH, a newcomer, is welcomed. DWG, in Brussels, Ontario, sends in his first traffic count. Traffic: VE3BUR 238, VZ 153, CI 132, AJR 121, KM 101, NG 79, TM 76, NO 49, AUU 47, DWG 40, PH 14, VD 2.

**QUEBEC**—SCM, Gordon A. Lynn, VE2GL—AII, has a Lettine 240 with an S-40A receiver on all bands from Iberville. AVZ is a YL newcomer at Victoriaville. PV experiments with the radio control of miniature boats. ZI has changed QTH to Cap de la Madeleine. AND keeps LaTuque on the air. EC continues his skeds and handles considerable traffic: The new c.w. slow-speed net on 3710 kc. operates Fri. at 1900 EDT. AEV now is mobile on 75 meters. Congrats to ABS on his marriage May 21st. ACP is changing his QTH to Ottawa. ADD is Asst. EC for Amos. ATT is the new publicity manager of the South Shore Amateur Radio Club. The McGill Radio Club has had a good year with the club station, UN, with ACK as president. The new officers are SC, pres.; LS, vice-pres.; AQL, treas.; and AIY, secy. LS is summer relief operator at a TV transmitter station and is using a new mobile rig. AQL has moved to Chambly. SC is at a 50-kc. broadcast station for the summer and is building a DSRC rig using a pair of 304THs. AUU is sold on 4-wave ground-plane antennas. PQN has reduced sked to Mon., Wed., and Fri. for the summer months. ASU is an excellent c.w. operator although still in high school. Traffic: (May) VE2DR 102, EC 30, ATC 26, FL 9, GL 7. (Apr.) VE2DR 112, II 66, EC 39, ATC 14, FL 11.

**ALBERTA**—SCM, Sydney T. Jones, VE6MJ—PAM: OD, RM: XG. The Lethbridge and Coaldale amateurs did a fine job in keeping communications open recently when heavy wet snow knocked out telephone lines. The Coaldale end was handled by AM, TS, CK, VH, and HF, and the Lethbridge end by DY, OF, TG, OS, and VJ. HM is away on a trip to Eastern Canada. NX really is working the DX on 14 Mc. MJ made a trip to VE5-Land and visited the gang at CBK Watrous. AL is QRL working on a new 813 rig. WC is rebuilding to eliminate the TVI. We are sorry to report that ZR has departed for VE2-Land. Good luck, Ernie and Barbara. Traffic: VE6AM 144, HM 122, OD 38, WC 18, YE 16, AL 13, MJ 5, IZ 4.

**BRITISH COLUMBIA**—SCM, Peter M. McIntyre, VE7JT—Sorry to report the passing of ZZ, one of the original hams in Vancouver and also one of the original signers of the charter of the British Columbia Amateur Radio Association. AAJ reports that on May 29th amateurs in the Okanagan took part in a civil defense exercise. Those known to have taken part were AAJ, EQ, FS, and QC. XY, at Dawson Creek, is bewailing the fact that band conditions are poor. AUF, Lois, of Spring Island, has been appointed EC of District #2 of Vancouver Island. Congrats to the Royal City Amateur Radio Assn. on becoming an ARRL affiliated club. US suggests that 3755 kc. not be used for long ragchew QSOs but be kept as a listening-out frequency, which I believe was the original intention of 3755 kc. as well as being the net frequency. Make your initial call on 3755 kc. and if you make a contact, if you are a fixed home station, QSY up or down, which will leave the frequency clear for another call and especially for the mobiles. But don't forget to listen once in awhile on 3755 kc. Another bad habit I have noticed is that someone gives a piece of traffic for relay during the net and all and sundry who have heard the traffic pre-net time get in the act and pass that traffic. Don't do it, let the person who received it pass it as he was asked to do by the originator. There will be no column next month as I will be away on vacation in W9-Land, I hope. Traffic: VE7QC 218, ASR 71, AUF 49, JT 19, ZV 18, ZF 12, FS 11, AIO 9.

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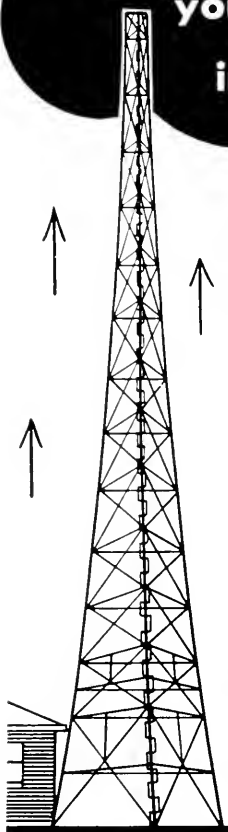
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## Antenna Bridge

(Continued from page 15)

capacitor 30 to 50 times larger than the total tuning capacitance to counteract it. So a 0.002- $\mu$ f. capacitor was placed in series with the single-ended output terminal (stud of the coax connector) and the end terminal of the coil. Then the two binding posts were shorted with a piece of straight, round wire and the coax connector was plugged into a shorted female connector. The grid-dipper then showed resonance at 12.3 Mc. This indicated that the capacitor was about 30 per cent larger than it should have been so it was replaced with .0015  $\mu$ f. (1000  $\mu$ f. and 470  $\mu$ f. in parallel shown in the photograph). A grid-dip check with both input and output shorted then showed resonance at 14.6 Mc., again amply close.

The same balun turned out to require 4  $\mu$ f. (plus the 8  $\mu$ f. distributed) for shunt tuning at 28 Mc. and the series capacitor was 420  $\mu$ f. A 10 per cent error in the value of either of these capacitors is relatively unimportant. With the values indicated for 14.3 Mc., errors caused by the balun itself were so small as to be unreadable when used with a bridge such as the one described in this article (well below 1 per cent if the 50,000-ohm shunt-coil losses were used to determine a correction factor).

Omission of the leakage-reactance correction capacitor made quite a sizable error when measuring loads of 100 ohms or less at 28 Mc. Inclusion of the capacitor reduced these to less than 2 per cent for any value.

As mentioned previously, the 1000  $\mu$ f. and 470  $\mu$ f. forming the 0.00147- $\mu$ f. series capacitor for 20-meter operation are shown in the illustration between the outer terminal of the winding and the center stud of the connector. Either tuning capacitor (4  $\mu$ f. for 10 meters or 39  $\mu$ f. for 20 meters) can be connected externally across the binding posts.

When using the balun for 10 meters, the 1000- $\mu$ f. portion of the series capacitor is opened.

In conjunction with the bridge, the balun described can be used over a  $\pm 500$ -kc. range on 20 meters and  $\pm 1$  Mc. on 10 meters, without retuning.

### Conclusion

The simple antenna bridge described here can be used for almost any type of r.f. impedance measurement that the amateur is called upon to make. The possibilities in this regard have only been touched upon in this article, but the many applications have been well covered in amateur literature. There is only one warning—do not, under any circumstances, leave the bridge in the circuit while the transmitter is in use. The bridge is a measuring instrument, not a device for monitoring the performance of the transmitter.

**Strays**

W2DIT and W2DAH both live on Long Island.

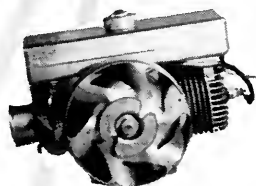
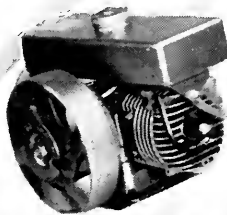
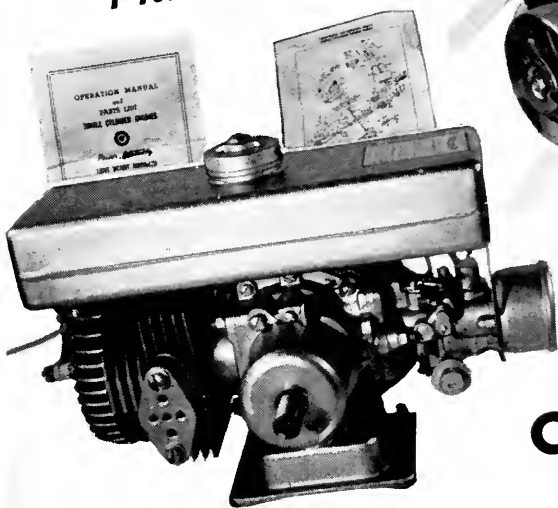
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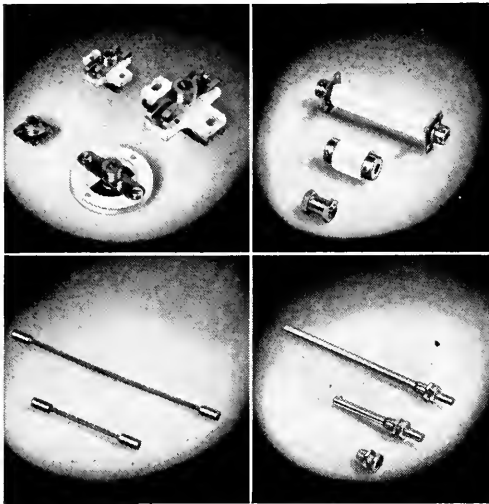
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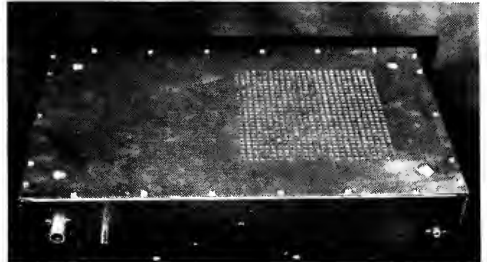


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## 807s in Parallel

(Continued from page 20)

the 750-volt 100-ma. condition. In this case, with maximum inductance in use, the  $Q$  will run around 17 or 18. Also, the values of input capacitance shown in the table include tube output capacitance and other stray capacitances, so that input capacitances of less than about 50  $\mu\text{f.}$  will probably be unattainable. Where the



The amplifier is enclosed in an inverted aluminum chassis in which the bottom plate serves as the top cover. Along the rear edge are the output coax connector, ground post, tip jacks for heater, screen and plate voltages, and r.f. input jack.

table shows less than 50  $\mu\text{f.}$  input capacitance,  $C_4$  should be operated as close to minimum capacitance as practicable.

An exciter should be connected to  $J_1$ , and the coupling adjusted to give about 7 ma. of amplifier grid current. With a 50-ohm load connected to the output, the input and output capacitances should be set as closely as possible to the values indicated in the table, and the variable inductor should be adjusted for resonance as indicated by the customary dip in plate current. Decreasing the output capacitance or the inductance (or both) while maintaining resonance with the input capacitor should increase loading. Adjustment in the opposite direction should decrease the loading.

## "Little Gem"

(Continued from page 17)

of the dial settings at different frequencies can be made and placed on the back cover plate of the box, and the instrument used as an indicating wavemeter. The chart can be calibrated by the use of a grid-dip meter or VFO. It might be well to remember that the calibration (when used as a wavemeter) will change slightly if an external antenna is used. When microampere measurements are being made, test leads are plugged into the pin jacks and the meter is used like any standard microammeter. Care should be taken not to use the instrument in circuits where the current will deflect the meter over full scale. The amount of amplification that the transistor will have depends on the par-

(Continued on page 114)

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ticular transistor used. The transistor in this unit was found to have a current gain of 20, or 26 db., so that full-scale deflection on the 0-1-ma. meter was 50  $\mu$ a. To calibrate the meter for microammeter measurements, a simple calibration circuit can be set up using a dry cell and several known resistances. A diagram of the circuit is shown in Fig. 2. Currents that will flow in the circuit with given resistances are also shown. By the use of

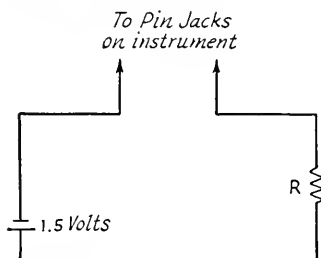


Fig. 2—Microammeter-calibration circuit using known resistances and voltage. By using a 1.5-volt cell and known resistances  $R$ , current  $I$  will flow in the circuit. Naturally, the closer tolerance resistors will give more precise calibrations.

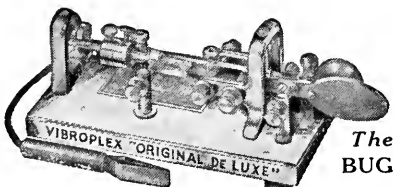
$R$ (ohms)	$I$ ( $\mu$ a.)
150,000	10
68,000	22
47,000	32
33,000	45
18,000	83
15,000	100

Ohm's Law any current flow through the circuit can be calculated if the resistance and voltage are known. By plugging in a pair of headphones and setting the function switch on field strength meter, the quality of a 'phone signal may be observed. The transistor is acting as an amplifier in this position, so the gain will be more than enough for strong headphone volume. This feature will be appreciated when monitoring a mobile 'phone signal, where the signal strength is low.

The basic movement of the meter in this instrument may be used by switching the function switch to milliammeter. Leads are connected to the pin jacks and the instrument is used accordingly. External shunts may be used with the basic 0-1 ma. movement to provide an extremely wide range of current measurement.

A PNP junction transistor was used in this unit. However, a NPN type may be used if the cell, meter, and tip-jack leads are reversed.

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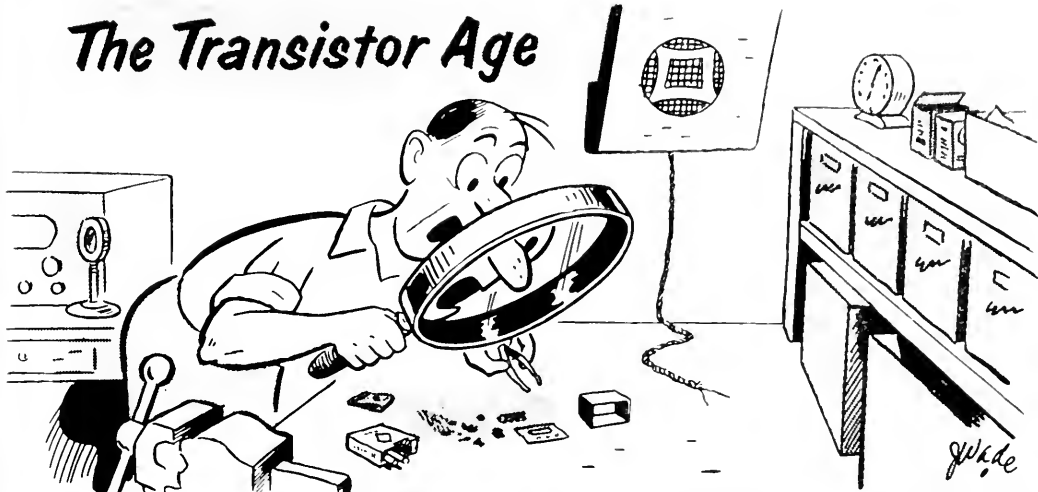
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—Science News Letter



# The Transistor Age

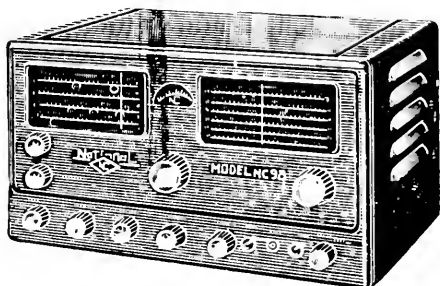


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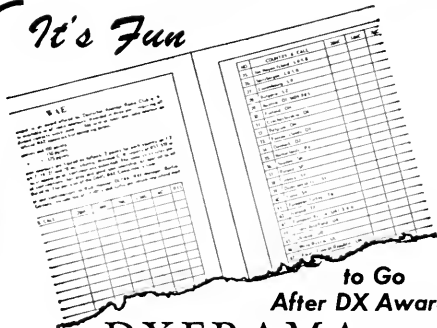
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## Power and Meter Facts

(Continued from page 25)

will do.) Next, I adjust the coupling of the feed-line to the final. The coupling is set for maximum power output at a given plate current at resonance. If the coupling is increased, the d.c. plate current goes up, but the output either remains constant or decreases. This point of maximum output for a given amount of input comes close to the magic point of proper adjustment for all linear amplifiers. The old method of loading by reference to "dip at resonance" is not recommended. Once we have reached the suggested adjustment, we have had it as far as coupling goes. If the d.c. current is less than 300 ma. (for the amplifier under discussion), we simply don't have enough linear drive.

Now, regardless of the power I believe my amplifier should handle, I make a crude check to determine at what point it actually flattens. I vary the amount of carrier insertion, watching mainly the output indication, and note the point at which increasing the carrier no longer results in a rapid increase in output. I now observe the plate meter reading, hoping in this case that it is up to 300 ma. I use this figure to multiply by plate voltage. This is roughly my maximum-signal linear power available. Suppose my linear drive available limits my actual plate current to 250 ma. My maximum signal power is then only 375 watts instead of the possible 450.

Next, I remove the carrier. I change to voice. This is the point where experience in using a 'scope counts. I know that my voice, using the average plate meter, will deflect the meter only about half as far, for the same maximum signal power, as the carrier did. Thus, since my steady signal current was 250 ma., I wouldn't expect much over 125 ma. on normal talking. The only way to achieve more meter swing under this set of amplifier conditions and not splatter would be to use properly designed and adjusted compression in the exciter's audio.

Reviewing the preceding material, you can determine that my "meter peak, on voice" or legal power, is only 187 watts (125 ma.  $\times$  1500 volts). My maximum signal or peak envelope power is 375 watts (250 ma.  $\times$  1500 volts). The instantaneous peak power is about 750 watts. As the saying goes, "You pays your money and takes your choice."

Actually, your voice might be able to swing the meter somewhat more than mine for the same amount of maximum signal power. If I were using a Class AB amplifier I would expect the meter to swing somewhat higher on voice in relation to its reading on steady signal.

Don't think that I am recommending the above procedure as a replacement for legitimate "two tone" adjustment with a 'scope. Anyone who has worked with linear amplifiers knows that inserting large amounts of steady signal (carrier or single tone is worse; "two tone" less punishing) has the rather disconcerting and costly tendency

(Continued on page 118)

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Gentlemen:

Florida, 13 May 1955

I'd like to express my enthusiasm and satisfaction regarding your 20-meter rotary beam antenna. I purchased one of your standard two-element units in February of this year. Prior to this time I had been using a collinear array about one wavelength above ground. The transmitter feeding this antenna had a power output of about 35 watts, and results were quite discouraging.

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I am able to keep schedule with amateur radio —\* in the Cape Verde Islands every week. *It was impossible to even hear this station before using the Gotham beam.*

Extremely high winds are prevalent in this part of Florida. The Gotham beam has withstood blows in excess of 50 miles an hour without failure.

The elements bend almost double in these high winds, but readily return to their original configuration when the wind abates. I feel that this is an extremely important feature of the Gotham antenna.

I have enthusiastically recommended Gotham to all the hams who ask what type I am using (and most of them do, when I tell them the amount of power I'm using). I wish you every success with your product, and feel that it is well worth the modest price.

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### 10 METER BEAMS

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☐ Deluxe 2-El Gamma match 18.95 ☐ T match 21.95  
☐ Std. 3-El Gamma match 16.95 ☐ T match 18.95  
☐ Deluxe 3-El Gamma match 22.95 ☐ T match 25.95  
☐ Std. 4-El Gamma match 21.95 ☐ T match 24.95  
☐ Deluxe 4-El Gamma match 27.95 ☐ T match 30.95

### 15 METER BEAMS

☐ Std. 2-El Gamma match 19.95 ☐ T match 22.95  
☐ Deluxe 2-El Gamma match 29.95 ☐ T match 32.95  
☐ Std. 3-El Gamma match 26.95 ☐ T match 29.95  
☐ Deluxe 3-El Gamma match 36.95 ☐ T match 39.95

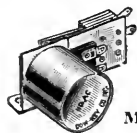
### 20 METER BEAMS

☐ Std. 2-El Gamma match 21.95 ☐ T match 24.95  
☐ Deluxe 2-El Gamma match 31.95 ☐ T match 34.95  
☐ Std. 3-El Gamma match 34.95 ☐ T match 37.95  
☐ Deluxe 3-El Gamma match 46.95 ☐ T match 49.95

(Note: Gamma-match beams use 52 or 72 ohm coax.  
T-match beams use 300 ohm line.)

Name.....  
Address.....  
City.....Zone....State.....

## MIDGET ALL-PURPOSE POWER RELAYS BY DOW



Model DKP

**DKP**

... a new class of relay  
for Radio and Industry

**S**ILENT as a DC relay, rated at 25 amps non-inductive load at 110 V... mounts easily under a 1½" chassis... carefully engineered for control circuits, motor starting... quiet, rugged... linkage and lost motion eliminated by direct magnet thrust... this versatile relay solves mounting problems: easily changed mounting foot allows combinations for chassis, bank or rack mountings... heavy leaf springs and ¾" coin silver contacts with operate time of 2 to 5 milliseconds put the DOW Midget All-Purpose Power Relay in a class by itself.

Contacts	Amateur Net	AC	DC
SPST	.....	\$5.85	\$5.50
SPDT	.....	5.90	5.60
DPST	.....	6.00	5.70
DPDT	.....	6.25	5.95

THE DOW-KEY CO., Inc.  
WARREN, MINNESOTA

of making vacuum tubes melt. Discretion is always indicated when making adjustments. However, if cautiously used, the procedure is guaranteed to do one thing — to produce a signal vastly more neighborly than one generated in an all-out attempt to wrap the pointer around the pin.

While I have been writing, I have had a vague feeling of someone looking over my shoulder and wanting to say, "I always knew there was some reason why those 'sidebanders' sound so terrible and are so broad. Now I know. They are all 'meter benders'!"

Well, old man, I don't want to start an argument now, but remember the saying about people who live in glass houses. Just because "sidebanders" as a whole are "distortion conscious" it doesn't necessarily mean that they invented the stuff. Sideband enthusiasts with their s.s.b. receiver, transmitters, and voice-control operation, are actually achieving a worth-while increase in voice communication — per kilocycle per watt per hour. This would be impossible if the linear-amplifier situation was really "rotten."

This is not a plea for more than a small percentage of the present operators to become less meter happy. The purpose is to collect a few facts about the use of d.c. meters in voice circuits and to give some pointers concerning power calculations.

Almost everyone who first uses a linear amplifier in s.s.b. service thinks first of the power available. If things progress normally, a change occurs. At some point he starts adjusting for linearity and then accepts the power that results. When that happens, you know that he has graduated into a new and mature attitude toward our old friend Mr. D. C. Plate Milliammeter.

## One Tube

(Continued from page 28)

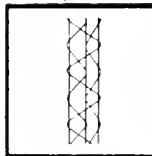
characteristic of practically all transmitters that an r.f. click will be generated by the opening and closing of the key. While this click may not travel far on the air, it can still be nasty enough to cause interference to neighboring broadcast and TV sets as well as the operator's own receiver. It is a simple matter to get rid of the click, and two capacitors and r.f. chokes will do the job. The important thing about using a filter is that it be mounted right at the key.

For testing purposes, a dummy antenna should be connected to the output terminal. Use a 40- or 60-watt electric lamp for the dummy load. The key plug is inserted in its jack and the key is left open. With the 115-volt line connected to the rig,  $S_1$  is turned on and the 6X5 filaments are allowed to warm up for a minute or so. Then  $S_2$  is turned on and the 5Y3 allowed to warm up for another few minutes. The power supply is switched to the low-voltage output. The key is then closed and the plate capacitor tuned for resonance as indicated by minimum brilliance in

(Continued on page 120)

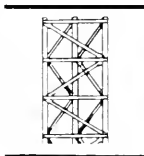


Amateur radio types • Guyed towers for FM-TV antennas • Vertical Radiators • Microwave towers • Commercial Communication towers • Transmission line supports, etc.



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Height to 80'  
Width—6.5"  
10' section—  
22 lbs.  
Use—Mast for TV  
Amateur, Port-  
able, and Wire  
type antennas



### SERIES 2400

Height to 280'  
Width—22.6"  
10' section—  
112 lbs.  
Use—Tower for  
Trylon Rotary  
Beam, AM  
Broadcast, and  
Microwave  
antennas



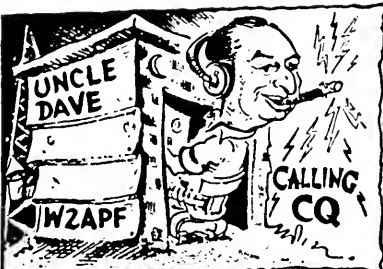
### SERIES 6000

Height to 600'  
Width—60"  
10' section—  
653 lbs.  
Use—TV Broad-  
casting and  
curtain antennas  
for International  
Broadcasting

\* Between CG of Tower Legs

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**WIND TURBINE CO., WEST CHESTER, PA.**



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2 Meters

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VFO Controlled, Band-  
switching, Gangtuned.  
Covers 80, 40, 20, 15,  
11 and 10 meters; 150  
watts CW; 120 watts  
phone; entire RF sec-  
tion enclosed in metal  
shield. (In Stock)

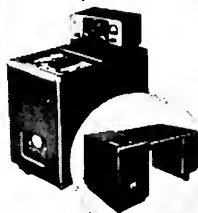
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XMTR KIT**  
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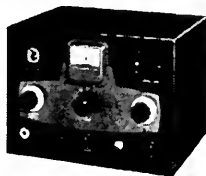
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HT30-Transmitter  
Exciter ..... 349.95

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National HRO-60 (W/Coils & Spkr).... 395.00

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6 or 12V DC-134.50  
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Power Supply- 24.50  
.....  
AF67-Transciter  
\$177.00

### NATIONAL

HR060T ..... 549.50  
complete with coils & spkr  
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2 meter converter  
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Power supply.. 17.95

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on stock items

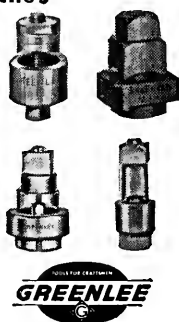
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the plate dial lamp. The dummy lamp should also light up at this point. Don't expect the lamp to be at full brilliance. While lamp bulbs make a convenient dummy antenna, they don't always match the output characteristics of a transmitter and consequently won't load the transmitter fully.

For 40-meter operation, a 40-meter crystal should be inserted in the crystal socket and  $S_4$  switched to short out the unused portion of the plate coil. Tune-up procedure is the same as on 80 meters.

It is possible to use an 80-meter crystal and double in the plate circuit for 40-meter operation. However, for maximum efficiency, it is best to have crystals of frequencies that fall in the band in use.

To put the rig on the air, it is imperative that an antenna coupler be used. The unit described here was given extensive on-the-air tests. The antenna coupler used was the one described by the writer in *QST* for April, 1955. The antenna was 135 feet long, center-fed with open-wire TV line. Over 70 contacts in 30 states were made in a 4-day session.

In constructing, testing, and using this transmitter or any transmitter for that matter, the beginner should always exercise extreme caution in dealing with electric power. Be sure and check that all voltages are off before touching any of the components below deck and in the shield box

## Proven Performance



MODEL  
**CD-2**  
**FCDA**  
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## Buffalo RACES

(Continued from page 44)

rigs capable of being removed and operated on either 110 v. a.c. or 6 v. d.c. They use 19-inch vertical whips.

The Aid Check Points are located around the perimeter of the heavily-populated areas. These RACES stations utilize a unit with 17 watts output to a ground-plane antenna.

Each of the fifteen large townships in Erie County has what is called a Report Center. Each Report Center has a complete RACES radio station to relay traffic from the local area directors to the main Control Center. These stations at the Report Centers utilize 100-watt transmitters feeding a beam antenna centered on the Control Center in Lancaster, N. Y. All antennas are vertically polarized for compatibility.

All installations are completely independent of commercial mains by virtue of having a gasoline-driven a.c. generator available delivering from 2 to 5 kilowatts, depending upon requirements.

Many of you reading this article will probably ask where do the personnel to operate a communications system of this size come from. When General E. G. Ziegler, the County Director of Civil Defense, originally outlined his requirements for RACES communications, we knew that only with complete cooperation from the local

(Continued on page 122)

# Why take less for that trade?

you'll do better when you deal at Burghardt's!

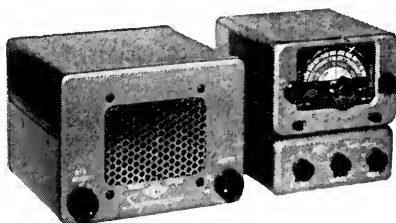


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## CONSET SUPER SIX CONVERTER

An outstanding six-band amateur mobile converter. Covers 75, 40, 20, 15, and 11-10 meters. Also has 19 and 49 meter BC band coverage for casual listening. Very high sensitivity using an 8 ft. whip. **ONLY \$5.25 DOWN**  
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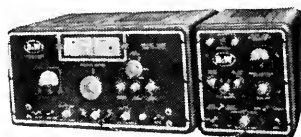
**CONSET NOISE CLIPPER**—standby of a great many mobile operators. Greatly reduces ignition and similar types of interference. Easily installed on any receiver, fixed or mobile, with conventional diode second detector circuits. **ONLY \$9.25**

## B & W SINGLE SIDEBAND GENERATOR AND THE NEW 5100S TRANSMITTER

What a combination! Teamed up with the new 5100S transmitter, this B & W Single Sideband Generator gives you outstanding SSB operation on all the frequencies provided in the 5100S. Tuning and operation is a breeze — no test equipment required. Completely self-contained, the 51SB requires no external accessories other than a microphone. The 5100S gives you 150 watts input on SSB and CW, 130 watts on AM phone. Other features include: VFO or crystal operation and a pi-network final. The 51 SB cabinet bolts directly onto the 5100S cabinet, extending the 22" length to 32". Easy to install, the 51SB comes factory wired and tested, complete with all tubes and necessary hardware.

## CONSET SUPER-CEIVER

Used in conjunction with any quality amateur converter, the compact SUPER-CEIVER provides mobile performance comparable to that of a high quality fixed-station unit. Performance is outstanding on both phone and CW — unit is crystal controlled for maximum stability. Eight tuned circuits at 262 kc provides high selectivity. Self-contained vibrator power supply furnishes voltage regulated power to the converter and to the BFO. Latter is highly stable with adjustable pitch control. Separate RF and AF gain controls and adjustable squelch. Highly effective noise clipper—unit has internal speaker—connections provided for external speaker, if desired. Easily converted to 12 Volts. **ONLY \$11.95 DOWN** (Price does not include converter)  
\$6.51 per month for 18 months



**B & W 5100S and 51SB**—Completely bandswitching on 80, 40, 20, 15 and 11-10 meters. With back wave diminution and excellent keying and break-in. **ONLY \$74.70 DOWN.**

**B & W 5100S** **ONLY \$46.75 DOWN**

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## B & W SINGLE SIDEBAND RECEIVING ADAPTER

Now—convert your present receiver for: True single-signal reception on CW—Selective sideband reception on AM—Superb performance on SSB. May be used with any receiver having an intermediate frequency between 450 and 500 kc. "Gating control" permits tuning over a narrow frequency range without disturbing main receiver tuning.

Easy to install and adjust, unit is entirely self-contained in an attractive cabinet complete with power supply and a 7" dynamic speaker.

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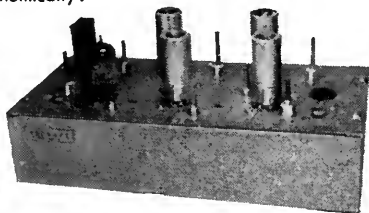
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# Tecraft

**Get Going on 6 QUICKLY!**  
—or on 10-11, 15, 2 or 220

*Y*OUR present receiver and this *Tecraft* crystal controlled converter will do the job—obly and economically!



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Choose I.F. frequency—6-10, 7-11, 8-12, 10-14, 12-16, 14-18 or for COLLINS, 26-30 Mc. Model CC5-220 with I.F. 14 to 19 Mc. only. This is a Cascode model—4db noise figure. (144 Mc) Tube line up: 6BZ7, 2 6CB6, 2 6J6.

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There are fifteen township report centers, each requiring communications. This is the Elma Township station. The operator is K2DJN.

amateur radio operators would the success of this program be insured. Today, two years later, it can honestly be said that the local amateur radio operators in Erie County have more than justified the faith the Erie County Board of Supervisors put in them when they authorized the expenditure of \$57,000 for the equipment to outfit all of the RACES installations in the county. We have a total of 167 licensed amateur radio operators enrolled in civil defense and cleared in accordance with RACES regulations. There are more amateurs signing up each day and it is hoped that eventually every amateur in Erie County will be actively participating in the RACES program

## Operation Cue

(Continued from page 47)

during the Operation Cue program. It takes more than two weeks of concentrated study to absorb more than a smattering of information on atomic energy, but most of us observers felt we had in that two weeks picked up far more atomic energy information than the average person will get in his lifetime. It was an experience we'll never forget. And spectacular as it was, the explosion itself was only, as FCDA's Harold Goodwin put it, the attraction to get us out there to attend the briefings. The pre-shot and post-shot visits to the test area were as important as the witnessing of the shot itself, if not more so. ARRL was present, not only in the person of ourselves, but in the persons of the many other amateurs who attended and took part.



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Self Supporting  
**STEEL TOWERS**  
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You can erect this tower yourself. Just dig four holes, set anchor posts in place, bolt the pieces together. 3 1/2 ft. ladder sections make it easy to work higher as tower goes up. It's a lot of fun to build your own tower — and saves you money, too!

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Width of  
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Vesto Towers are available in a wide range of sizes to meet requirements of amateurs and commercial users alike. Note the low prices for these quality lifetime towers: 22'—\$104, 28'—\$127, 33'—\$149, 39'—\$182, 44'—\$208, 50'—\$239, 61'—\$299, 100'—\$895.

Towers are shipped to your home knocked down, FOB Kansas City, Mo. 4th class freight. Prices subject to change...so order now! Send check or money order...or write for free information.

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**2.75** each  
Lots of 10 Assorted  
**2.95** Singly, each

Nickel-Steel and Silicon Steel Laminations. Wound on Nylon Bobbins in a Mylar Outer Wrap. Color Coded Leads. Have you been experimenting with transistor circuits? And have you been forced to make-do with compromise transformers or improvised units? And have you had to pay from \$5.00 to \$12.00 for them? The Argonne line brings you a wide variety for experimentation as well as for replacement. Efficiently designed to meet the needs of miniaturization and engineered to provide more power handling capacity and improved frequency response with minimum distortion. All are nickel-steel laminations except asterisk which are silicon steel. Average net weight 13.4 oz. average shipping wt. 4 ozs.

Argonne Number	Type	Primary Ohms	Impedance Second-ary Ohms	Unbal-anced Current Pri. D.C. MA	D.C. Resistance Pri. Ohms	Resistance Sec. Ohms	Overall Size
AR-100	Input	200,000	1,000	.0	3600	90	1"x3"x3"
AR-101	Input	100,000	3,000 CT	.1	3600	60	1"x3"x3"
AR-102	Input	100,000	1,500 CT	.1	3600	40	1"x3"x3"
AR-103	Driver	20,000	2,000 CT	1.5	400	50	1"x3"x3"
AR-104	Driver	20,000	1,000	.0	400	50	1"x3"x3"
AR-105	Driver	20,000	400	1.5	600	30	1"x3"x3"
AR-106	Driver	15,000	4,000	1.5	620	50	1"x3"x3"
AR-107	Driver	15,000	200	1.5	1000	20	1"x3"x3"
AR-108	Driver	10,000	3,000 CT	0	500	50	1"x3"x3"
AR-109	Driver	10,000	2,000 CT	2	600	2.5	1"x3"x3"
AR-110	Output	5,000	100	1	600	10	1"x3"x3"
AR-111	Output	5,000	200	1	120	25	1"x3"x3"
AR-112	Output	3,500	200	9	100	60	1"x3"x3"
AR-113*	Driver	3,000 CT	1,000	10	70	1	1"x3"x3"
AR-114	Output	2,500	11	0	150	650	1"x3"x3"
AR-115	Input	2,000 CT	8,000 CT	4.	120	20	1"x3"x3"
AR-116	Output	2,000	200	0	20	1.5	1"x3"x3"
AR-117	Output	500 CT	30	0	20	1.5	1"x3"x3"
AR-118	Output	500 CT	16	0	20	1.5	1"x3"x3"
AR-119	Output	500 CT	3.2	0	20	.3	1"x3"x3"
AR-120*	Output	400 CT	11	1.	20	.25	1"x3"x3"
AR-121*	Output	300 CT	3.2	0	11	.3	1"x3"x3"
AR-122*	Output	250 CT	3.2	0	11	.3	1"x3"x3"
AR-123	Input	200	2,000 CT	2.	11	.50	1"x3"x3"
AR-124*	Output	200 CT	16	0	20	1.3	1"x3"x3"
AR-125	Input	3	4,000	.0	.11	.50	1"x3"x3"

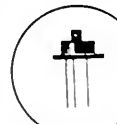
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TRANSISTOR

TYPE 2N107

P-N-P



**\$1.25**

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**SALE!**

CK-722 RAYTHEON

CK-722—Singly, each..... 2.10  
—In lots of 10, each..... 1.95  
CK-721—Singly, each..... 2.40  
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High Output Dynamic Microphone



List Price

**\$47.00**

**\$12.95**

High quality Dynamic microphone exceptionally fine for Public address recording, etc. Flat response 60-10,000 cps. Impedance 30,000  $\pm$  15% at 1,000 cps output level —55 db. Die cast metal case equipped with 6 ft. of shielded cable. Shpg. wt. 3 lbs.

PA-19—in lots of 3 ..... 12.45  
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TOP QUALITY CRYSTAL MICROPHONE



COMPARE IT WITH ANY MIKE AT 2 to 3 TIMES THE PRICE

A quality crystal Microphone for PA systems, house recorders, etc. Frequency response 50 to 10,000 cycles Output level —52 db. Provides ample output for use with low gain amplifiers. Complete with 5 ft. of shielded cable. Shpg wt. 3 1/2 lbs.

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singly, each ..... **\$3.95**

LAPEL MICROPHONE



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• FULL —55 db. OUTPUT LEVEL!  
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Our Inexpensive Etched-Wire Kits Contain: Laminated Copper Boards (XXX-P); Printed Circuit Tube Sockets; Copper Etching Material and instructions; Etch-resistant material for Circuit layouts; Eyelets and drill for connections; Scaled Layout Sheets for making your own or standard Printed Circuits. All Kits Are



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**89**

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In lots of 10, each..... 79c

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The parts you've been looking for...

All K-W 'UNIVERSAL' fittings to which tools are applied are hexagonal to fit standard wrenches... All are nickel-chrome plated... All have standard 3/8-24 S.A.E. threads...

**BASE/EXTENSION SECTIONS**—Light weight... low wind resistance... fabricated from sturdy 3/8" steel tubing... special Jam Nut, one supplied with each section, permits removal of parts without damage to finish...

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AT YOUR JOBBERS' — Circulars on request

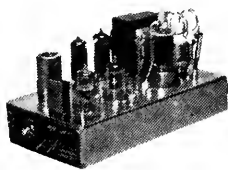
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## TWO METER TRANSMITTER • CONVERTER

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Area of Base is 68% of the size of this Ad.

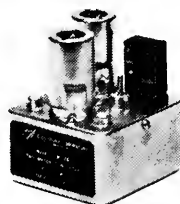


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LW-61 \$18.50 Postpaid



See QST May '54, pp. 47-48 or write for literature.

**ELECTRONIC LABORATORY**  
ROUTE 2, JACKSON, MICHIGAN

## QST — Vol. IV

(Continued from page 49)

including Canada. These stations will send at 11:30 P.M. their own local time. . . .

In Volume VI, at 11, May 1923, the short-wave "CQ Party" was reported as being a "decided success." Receipt of many logs was mentioned; and QST stated that "surprising distances on surprisingly low waves were recorded." The details were shown on pages 75 to 76, May 1923, under "Calls Heard." Logs were received from every district except the seventh. The range of wavelengths represented in the reports ran from 80 to 190 meters.

One result of some unspecified League test conducted in 1923 was later recorded in a headline affixed to an article by Dunmore, reporting some of the work done by the Bureau of Standards in the short-wave region. (See 75 to 77, July 1923, which is also in Volume VI):

. . . Attention is also invited to the fact that in our short-wave tests 6GI with a 5-watt tube set dropped to the supposedly impractical wave of 125 meters and on both nights of the test put a roaring signal into every state in the Union. . . .

On the night of November 27th, 1923, transatlantic amateur communication was first accomplished. A wavelength of 100 meters was used. Station 1MO, at West Hartford, Connecticut, with Traffic Manager Schnell at the key, worked French 8AB (Leon Deloy, of Nice, France). Shortly afterward, on the same night, John L. Reinartz (1XAM, ex-IQP, of South Manchester, Connecticut) also worked 8AB. All three stations used transmitting circuits devised by Reinartz. (On all of this, see Volume VI of QST, at 9 to 12, January 1924; and 26 to 27, January 1924).

Thereafter, there was no doubt in any amateur's mind that the use of waves around 100 meters in length, or even shorter, possessed DX capabilities; and that the reward arising from their use would be long-distance two-way communication with low power and not simply temporary relief from QRM. The lure of DX work was irresistible; and amateur developments in the short-wave field followed very quickly — both as to transmitting and receiving equipment.

S.S.Y., W0CQ

R. R. 3, Box 94  
Wayzata, Minnesota

## Strays

The amateur fraternity is saddened to learn of the death of F. Dawson Bliley, W3GV, ex-W8GU. Mr. Bliley had been active in amateur radio since 1920 and was the founder and president of the Bliley Electric Company. In addition to being a QST author, W3GV was highly active in v.h.f. circles. He was a pioneer of the 1 1/4-meter band and for some time held the 2-meter DX record.

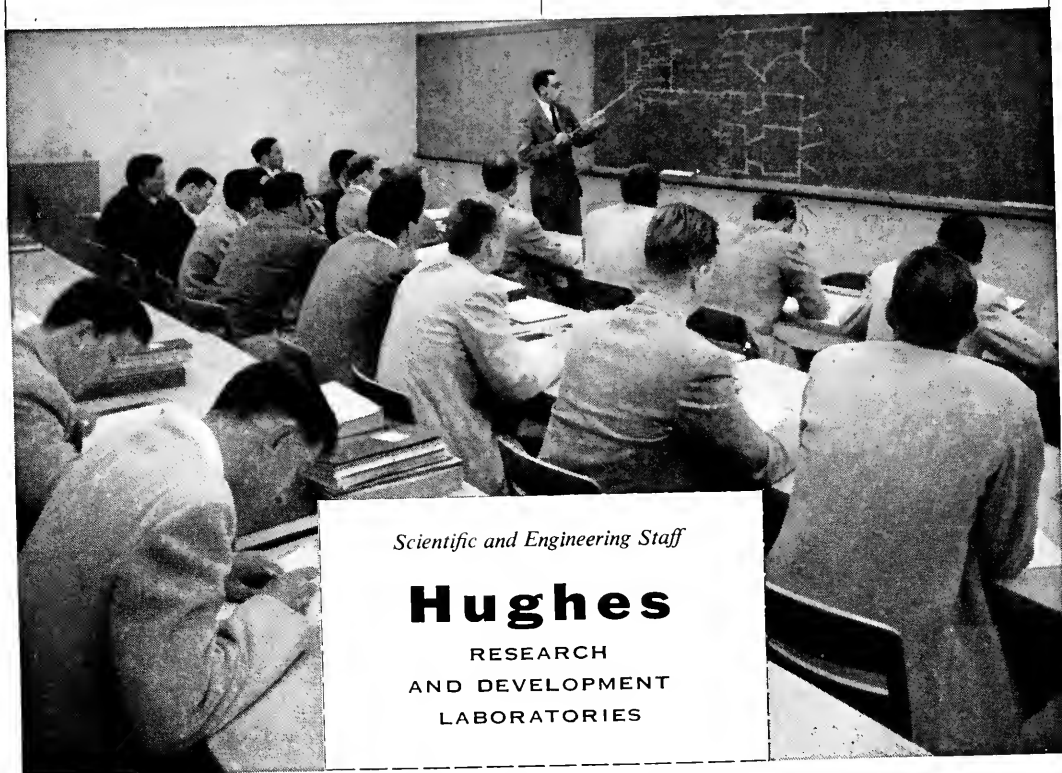
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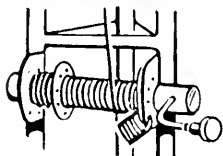
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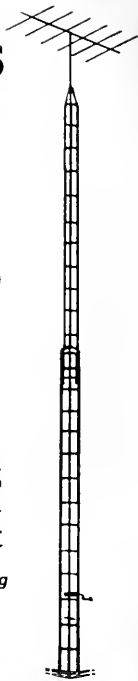


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## How's DX?

(Continued from page 63)

band quite a bit in search of WN/KN QSOs. However, Dan transmits on 7025, 7039 and 7065 kc., somewhat far afield to be spotted by Novices. On your mark for the 4th LABRE (Brazil) DX Contest scheduled for the first and second week ends of next month, c.w. and phone, respectively, 0001 GMT, Saturdays, to 2400, Sundays. The usual six-digit (c.w.) and five-digit (phone) serials will be exchanged — RST001, RST002, etc. — and all bands 80 through 6 meters may be used. **Scoring:** Contacts between stations (a) in the same country count zero points but add the multiplier; (b) of different countries, both outside the American area, count one point each; (c) of different countries within the American area count two points each; and (d) in the American area and stations in the rest of the world count three points each. The "American area" is that compassed by LABRE's WAA Award Countries List and is synonymous with North and South American countries listed on the ARRL DXCC Countries List. Multipliers designated are one per band for each American area country worked, and one per band for each Brazilian call area (PY1 through PY9) worked. For final score multiply contact points gained on all bands by the number of multipliers gathered on all bands, A1 only or A3 only. (The same station can be QSO'd on different bands.) As discerned from valid logs postmarked no later than November 30th, the LABRE Contest Commission, Caixa Postal 2353, Rio de Janeiro, will award 1st and 2nd-place certificates to multiband and single-band high scorers in each country and in each Brazilian call area. See you on the north-south path, amigos!

**Hereabouts** — HP1EH was prepared to have some rare fun in July but didn't get much chance. In error Louis was issued the call HO1EH. Panama authorities caught the switch before QSLs were printed. T19MHB's QSL brought W2QHH back into a magic circle. Howy has 229 postwar countries worked and 229 confirmed, a rare 100-per-cent situation, indeed. W2QHH also has worked 282 different KPs and has a confirmation from each. Incidentally, Howy picked off a French Saint Martin station in 1947, got the pasteboard, and now is one of the few who have this new ARRL Countries List addition verified. Speaking of St. Martin and other hard-to-bag Caribbean areas, several prominent DX personalities now are on the prowl down that way with portable stations. Other straws in the DX wind: Gough Island, near Tristan da Cunha (G3HPM as ZD9AD), the Comoros (Madagascar FB8s), Vatican State (numerous aspirants), Rhodes (SV0WU and others), and Tonga (VR2BZ). Watch out for a rare sleeper or two! KL7ZG hooked F8LF on May 24th, VQ4EU on the 25th, and believes these QSOs to be the first KL7-Europe and KL7-Africa contacts on 15 meters. Any KL7 comments to the contrary?

## Harmonics

(Continued from page 43)

rig is built from QST or Handbook plans, you might write to ARRL. However, since ARRL has not tried and tested the rigs described in contributed articles, you will probably save time by writing directly to the authors of such articles, whose addresses appear in the author's footnotes.

Good hunting, OM, and be careful to stay in the bands!

## Appendix

For the benefit of Official Observers and others interested in the problem of amateur harmonics in the 7350 - 7500-ke. region, we list below the calls and frequencies (approximate) of some commercial marker stations heard in this region.

7345 — OFB77	7437 — HBN
7347 — WWL53WWK47	7442 — HBP3
7362.5 — WWB27	7447 — HBN/1BP3
7367 — TQQ3	7475 — EDX
7393 — OEQ27/OET30**	7477 — GFV18 '22 '24
7395 — OFB77	7480 — EES
7407 — MKS2 MKS3	7484 — VFG
7415 — WE057A2	7485 — DGG481**
7427 — AT & T (N. Y. C.)*	7486 — AT & T (N. Y. C.)*

\* Single-sideband type signal.

\*\* Frequency-shift Morse signal.

## The Indian sang his death song



**100** YEARS AGO, during a frontier skirmish, an Indian brave, singing his own death song, charged down on a young officer, Lieutenant George Crook, 4th Infantry, coolly fell to one knee, carefully aimed, and dropped the brave in his tracks.

It was not Crook's first Indian, nor his last. By the time he made general, Crook was the greatest Indian-fighter this country has ever had.

Yet, he was also one of the best friends the Indians have ever had. For he understood them well, dealt fairly and firmly, and always kept his promises.

When Crook died, Indians wept. And a Sioux chief named Red Cloud said: "He never lied to us. His words gave the people hope."

No nation can ever have enough men like George Crook. But America had, and still has, a lot of them. That's important to remember. Because it is a wealth of human character rather than a wealth of money that gives America its real worth. Just as it is the Americans, all 160 million of them, standing behind our country's Savings Bonds, who make these Bonds one of the world's finest investments.

For your sake—and America's—why not take advantage of this fact? Invest in—and hold—United States Savings Bonds.



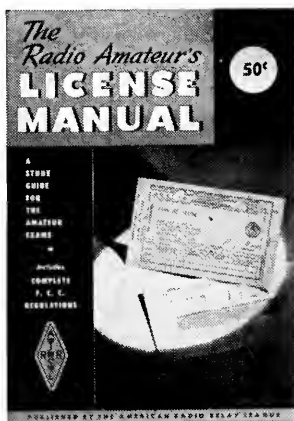
It's actually easy to save money—when you buy United States Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done for you. And the Bonds you receive will pay you interest at the rate of 3% per year, compounded semiannually, for as long as 19 years and 8 months if you wish! Sign up today! Or, if you're self-employed, invest in Bonds regularly where you bank. There's no surer place to put your money, for United States Savings Bonds are as safe as America!

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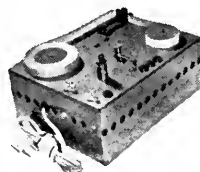
West Hartford 7, Conn.

**WANTED!** Amateur or govt. surplus receivers, transmitters, test equipment, teletype, Boehme, manuals; such as ART-13, ARN-7, ARC-1, APR-4, 75A, 32V, BC-610, BC-614, BC-342, BC-348, BC-221, TDQ. Cash or trade for NEW Johnson Viking Ranger, B&W, Hallicrafters, Hammarlund, Harvey-Wells, National, Central El, Gonset, Elmac, Morrow, RME, Telrex, Fisher Hi Fi, Pentron, Bell, Master Mobile, Sonar, etc.

Stores: 44 Canal St., Boston, Mass. 60 Spring St., Newport, R. I.

**ALLTRONICS** Write or phone, Tom, W1AFN,  
Richmond 2-0048 or 2-0916 Box 19, Boston 1, Mass.

## What Is This Thing Called the "Hump" in CODE?



THE hump (around 8 words) is the thing that tells you you have wasted your time by starting out wrong. Thirty years ago when we started teaching Code our students too ran head-on into the hump. We went to work to find out why. TWO-PHASE, STEP BY STEP instruction is the perfect answer. In this method dotdash is not A. The SOUND resulting from dotdash is A. There is also the important factor of correct timing. If the signals are not timed correctly the resulting sound will not be correct. There are many, many things connected with proper Code instruction, many of them so small they seem inconsequential. Others are so technical that many so-called experts fail to understand them. It's a long story but I have it all written up and will be glad to send it to you. A postcard will bring you the full story.

**TELEPLEX CO. 415 G. St., MODESTO, CALIFORNIA**

## World Above 50 Mc.

(Continued from page 58)

**W6SXX, SS Hawaiian Rancher** — Keeping listening schedules with various W6s on run to Hawaiian Islands. Also working KH6s on arrival there, and attempting to promote interisland work on 144 Mc.

**W7JRG, Billings, Mont.** — Working plenty of 50-Mc. DX, despite TVI problem from local Channel 2.

**W7UKI, Marysville, Wash.** — Working on 420-Mc. gear with W7TWQ.

**W7UZB, Seattle, Wash.** — Net operating each Tuesday at 2000 PST on 145.8 Mc., available for c.d. work, traffic, general rag-chewing, or to help in getting new stations started on the band.

**W9KLD, Kankakee, Ill.** — C.d. Net on 145.8 Mc. operating each Tuesday and Thursday at 1900 CST. Local 2-meter activity at a high level.

**W9KQK, Elmhurst, Ill.** — Experimenting with double pi tank circuit for 50 Mc. and playing with 10,000-Mc. set-up similar to Feb., 1947, QST. "Experimenting's for me!"

**W0MOX, Overland Park, Kans.** — Would like to set up definite calling and listening schedules with western 2-meter stations. Am available for skeds at 0600 to 0645 and 1800 to 2400 CST daily.



W0ZJB.....48	W5VY.....48	W9ZHB.....48
W0BJV.....48	W5GNQ.....46	W9QIV.....48
W0CJS.....48	W5ONS.....45	W9HGE.....47
W5AJQ.....48	W5JTI.....44	W9PC.....47
W9ZHL.....48	W5ML.....44	W9VZP.....47
W9OCA.....48	W5SFW.....44	W9RQM.....47
W6OB.....48	W5FSC.....44	W9ALU.....47
W0INI.....48	W5JLY.....43	W9QKM.....46
W1HDQ.....48	W5JME.....43	W9UIA.....45
W5MJD.....48	W5VU.....42	W9UNS.....45
	W5FAL.....41	W9MFH.....36
W1LL.....47	W5HLD.....40	
W1CLS.....46	W5HEZ.....38	W0QIN.....47
W1CGY.....46	W5FXN.....38	W0DZM.....47
W1GJO.....45	W5LIU.....37	W0NFM.....47
W1LSN.....44		W0TKX.....47
W1HMS.....43	W6WNN.....48	W0KYF.....47
W1DJ.....41	W6ANN.....45	W0HVW.....47
	W6TMI.....45	W0JOL.....46
W2AMJ.....46	W6IWS.....41	W0MVG.....46
W2MEU.....46	W6OVK.....40	W0WKB.....45
W2BYM.....46	W6CGG.....35	W0TJF.....44
W2RLV.....45	W6BWG.....30	W0URQ.....44
W2IDZ.....45		W0JHS.....43
W2FHH.....44	W7HEA.....47	W0PKD.....43
W2GYV.....40	W7ERA.....47	W0PI.....41
W2QVH.....38	W7BQX.....47	W0FKY.....32
W2ZUW.....36	W7FDJ.....46	
	W7DYD.....45	VE3AET.....43
W3OJU.....46	W7JRC.....44	VE3ANY.....42
W3NKM.....41	W7ACD.....43	VE1QZ.....34
W3MQU.....39	W7BOC.....42	VE3AIB.....32
W3OTC.....38	W7JPA.....42	VE1QY.....31
W3KMY.....38	W7FIV.....41	VE3DER.....27
W3RUE.....37	W7CAM.....40	XE1GE.....25
W3FPH.....35		CO6WW.....21
	W8NSS.....46	
W4FBH.....46	W8NQD.....45	
W4EQM.....44	W8UZ.....45	
W4QN.....44	W8RFW.....45	
W4FWH.....42	W8CMS.....43	
W4CPZ.....42	W8SQD.....43	
W4FLW.....42	W8LPD.....42	
W4OXC.....41	W8YLS.....41	
W4MS.....40	W8OJN.....40	
W4FNR.....39		
W4ICJ.....38		
W4BEN.....35		

Calls in bold face are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.

## FEED-BACK

In "Parallel 6146s in the Mobile or Fixed-Station R.F. Assembly," page 16, June QST, R<sub>3</sub> in the text should be two 15K 1-watt resistors in parallel (not two 1.5K resistors as listed).



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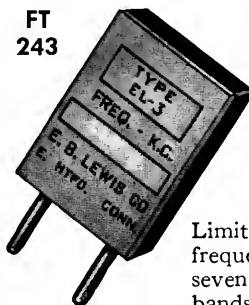
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**PORT ARTHUR COLLEGE** PORT ARTHUR TEXAS

Approved for G. I. training

## Happenings

(Continued from page 50)

and for vice-director but members are urged to interest themselves equally in the two offices.

League members are classified as Full Members and Associate Members. Only those possessing Full Membership may nominate candidates or stand as candidates; members holding Associate Membership are not eligible to either function.

Voting by ballots mailed to each Full Member will take place between October 1st and November 20th, except that if on September 20th only one eligible candidate has been nominated, he will be declared elected.

Present directors and vice-directors for these divisions are as follows: *Atlantic*: Gilbert L. Crossley, W3YA, and Charles O. Badgett, W3LVF. *Canadian*: Alex Reid, VE2BE, and Reginald K. Town, VE7AC. *Dakota*: Alfred M. Gowan, W0PHR, and Forrest Bryant, W0FDS. *Delta*: George H. Steed, W5BUX, and George S. Acton, W5BMM. *Great Lakes*: John H. Brabb, W8SPF, and Robert L. Davis, W8EYE. *Midwest*: William J. Schmidt, W0OZN, and James E. McKim, W0MVG. *Pacific*: Harry M. Engwicht, W6HC, and (no vice-director). *Southeastern*: James P. Born, jr., W4ZD, and Randall E. Smith, W4DQA.

Full Members are urged to take the initiative and to file nomination petitions immediately.

For the Board of Directors:

A. L. BUDLONG  
Secretary

July 1, 1955

## YL News & Views

(Continued from page 53)

may be used. A card from the District of Columbia may be submitted in lieu of one from Maryland.

3) Contacts with all 48 states must be made with stations operated by licensed women operators.

4) Contacts with all 48 states must be made from the same location. Within a given community one location may be defined as from places no two of which are more than 25 miles apart.

5) Contacts may be made over any period of years provided only that all contacts are from the same location as defined in Rule 4.

6) Forty-eight QSL cards, or other written communications from stations worked confirming the necessary two-way contacts, must be submitted by the applicant to the custodian for the WAS-YL award. Sufficient postage must be sent with the confirmations to finance their return. The YLRL will not be responsible for any loss or damage to same.

Custodian for the WAS-YL award is Lou Littlefield, W1MCW, 19 State Avenue, Cape Elizabeth, Me. Only seven of these awards have been issued to date — to W1FTJ, W2QHH (OM), W3OP (OM), W4ARR (OM), W4SGD, W8IJWX, and W9CMC (OM).

## YLCC Award

The YL Century Certificate for confirmed contacts with stations operated by 100 or more different licensed women amateur radio operators is issued by the YLRL at no cost to the applicant upon compliance with the following rules:

1) Two-way communication must be established on the authorized amateur bands with stations — mobile or fixed — operated by 100 *different* licensed women amateurs. Any and all amateur bands may be used.

2) All contacts must be made from the same location. Within a given community, one location may be defined as from places no two of which are more than 25 miles apart.

3) Contacts may be made over any period of years, provided only that all contacts are from the same location as defined in Rule 2.

4) Contacts with YLs anywhere in the world are recognized provided that confirmations clearly indicate that the stations contacted were operated by duly licensed women amateur radio operators.

5) One hundred QSL cards or other written communications from the stations worked confirming the necessary two-way contacts, accompanied by a list of claimed contacts

(Continued on page 132)

# NEW!

## 100 KC CRYSTAL CALIBRATOR

Provides accurate check points for transmitting frequency or for calibrating receivers and VFO's!

Extremely compact, this tiny crystal calibrator provides accurate 100 kc. check points to 55 mc. High quality, hermetically sealed military type crystal is superior to those usually found in a unit of this type. Circuit uses a 6BH6 tube and has an adjustable ceramic trimmer condenser for exact zero beating of the crystal to WWV or other standard.

Measuring only  $1\frac{1}{4}" \times 2\frac{1}{2}" \times 1\frac{1}{2}"$ , the chassis may be mounted inside receiver cabinet or in any convenient spot. (Overall height to top of tube is  $3\frac{3}{8}"$ .) Power may be taken from your receiver or other source—requires only 6.3 volts at .15 amps. and 150 to 300 volts at 2 ma. Special clips are provided for tube prongs of equipment furnishing power take-off. Power cable and extension leads are included to permit remote mounting of switch. Furnished completely wired and tested with tube.

Cat. No. 250-28 CRYSTAL CALIBRATOR

**\$17.25**  
AMATEUR NET



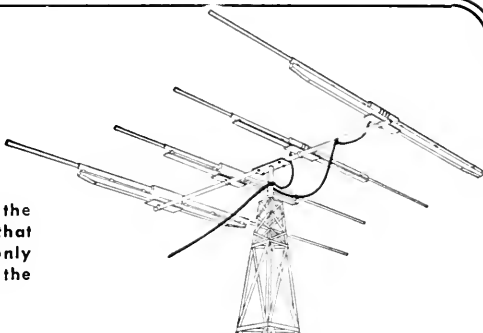
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You may not be thinking of anything as skookum as the array illustrated, but we urge you to start NOW on that beam you dreamed of all last winter. Summer is the only time for a project like this. Here are a few ideas for the various bands.

- |                       |  |   |
|-----------------------|--|---|
| <b>FOR 2 METERS:</b>  | GONSET TWIN SIX BEAM<br>HYLITE 4 ELEMENT BEAM<br>HYLITE 8 ELEMENT BEAM |   |
| <b>FOR 6 METERS:</b>  | LYSCO GROUND PLANE   |   |
| <b>FOR 10 METERS:</b> | HYLITE 3 ELEMENT BEAM<br>LYSCO GROUND PLANE                            |   |
| <b>FOR 15 METERS:</b> | Q MASTER 3 ELEMENT BEAM<br>GONSET BANTAM BEAM                          |   |
| <b>FOR 20 METERS:</b> | MOSLEY VEST POCKET<br>MOSLEY VEST POCKET<br>GONSET BANTAM BEAM         | VPA 20-2 ELEMENT BEAM<br>VPA 20-3 ELEMENT BEAM<br>Q MASTER 3 ELEMENT BEAM |
| <b>FOR 40 METERS:</b> | MOSLEY VEST POCKET<br>Q MASTER 2 ELEMENT BEAM                          | VPA 40-2 ELEMENT BEAM   |



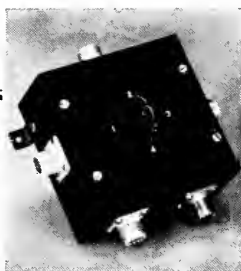
We stock copperweld wire and ALL types of insulators both for long wire types and beams. You may need something to hold your antenna up and rotate it so inquire about our telescoping masts and crank-up towers. We also feature the "VEST POCKET" and "SHORT DUBLET" coils for the builder.

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Low SWR 1.75 to 30 Mc. 5 amps of RF in any fixed position. 1000 volt ins.

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TC 2 \$3.90—TC 3 \$4.20—Spinner Handle 75¢ extra  
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CONCORD, N. H.

which should include the full names of the operators (alphabetically arranged) and the dates and times of contacts, must be submitted by the applicant directly to the YLCC custodian. Sufficient postage must be sent with the confirmations to finance their return by first-class mail. The YLRL will not be responsible for any loss or damage to same.

6) Endorsements: Confirmations of contacts, accompanied by alphabetical list, as per Rule 5, from stations operated by additional YLs may be submitted for credit each time 50 additional confirmations are available. Endorsements will be made to the original certificate as applications are approved.

7) Decisions of the YLCC custodian regarding interpretation of these rules as here stated or later amended shall be final. All inquiries regarding cards, applications, or the certificates should be addressed to her.

W7GLK, Dot Dickey, has resigned as YL Century Certificate custodian. Please hold QSLs until the new custodian, to be appointed by the president is announced in this department next month. To date 40 YLCC awards have been issued as follows:

1. W1BFT (OM)	17. W8SDD (OM)	33. W4LAS
2. W2QHH (OM)	18. W1VOS	34. W7ULK
3. W3JSH*	19. W0TAB	35. W8SPU
4. W8HLF	20. W6WRT	36. W6JZA
5. W4SGD	21. W3RXV	37. W6FKH
6. W4CKB (OM)	22. W9OMN	38. W4YYJ
7. W3OQF	23. W7RT (OM)	39. W4BLR
8. W7HHH	24. W9NN (OM)	40. W1AW
9. W8ATB	25. W2OWL	41. W9GME
10. W8HWX	26. W8MBI	42. W9YBC
11. W4ARR (OM)	27. W0HFP	43. W3VLX
12. W8HUX	28. W7FWR	44. W9LOY
13. W3OP (OM)	29. W6EHA	45. W6PCA
14. W9CMC (OM)	30. W8QVD (OM)	46. W5WUX
15. W4KYI	31. W6KER	47. W8FPT
16. W4VJX	32. W6QGX	48. K2IWO

\* Now K2DYO.

### WAC-YL Award

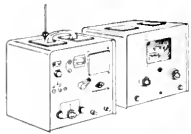
Any amateur offering proof of two-way communication with a YL operator on each of the six continents is eligible for a Worked All Continents-YL award. OM W2QHH holds the only such certificate issued to date.

Secy.-Treas. W0MMT, Marie Ellis, 608 Lesser Dr., Ft. Collins, Colo., or any of the officers given above will be pleased to furnish further details about the WAC-YL award.

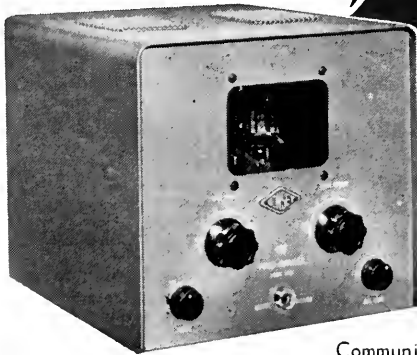
### Keeping Up with the Girls

W7HHH, Bea, lists the YLs who attended the ARRL Oregon State Convention at Portland: W7s ECC, FKS, FXE, HHH, ITZ, LS, NJS, NTT, QKU, QWX, QXH, RAX, RIC, RVM, SBS, SBX, SJW, SPC, SYF, UEL, ZKY, ZLT and W7N's ENU, UFN, WFO, WRA, AMN, and ZNK. . . . Officers of the LARK for the new term are President Helen, W9BCA; V. P. Rita, W9YXK; Secy. Mardine, W9IWP; Treas. Evelyn, W9YWH; Publicity Chairman Peg, W9SYX; "Pinfeather" editor Adeline, W9LDK; Novice representative Blanche, W9TDC. . . . OM W3YFW writes that he and his wife W3APT, Betty, are enjoying 80 and 40 c.w. together. Betty had her first QSO only a few hours before she gave birth to a baby girl. . . . Present at a Smorgasbord luncheon marking the final meeting of the season of the N. Y. C. YLRL were W2s EEO, EUL, IGA, IQP, QGK, MVV, OWL, QWL and Treas. Helen Zuparn. . . . New officers for the Los Angeles YLRC are President Helene W6QOG; V. P. Lorraine, W6AKE; Recording Secy. Jayne, K6GMX; Corresponding Secy. Lucille, K6EXV, and Treas. Gladys, W6DXI. In less than a year, club membership has almost doubled, with a current total of 60 YLs. . . . W9BCA and her OM participated in a TV show arranged by Hallierafters Co. of Chicago. Helen's seeing-eye dog, curled at her feet, listened to his mistress engage in a four-station QSO on two meters. . . . YLs who gathered for an informal meeting at the Dayton Hamvention were W3UUG, W4s UDQ, WJP, W8s HPP, LGY, MVA, OSD, RVP, RZN, SPU, VWL, WN8TXI, W9UJ and KL7BHE.

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25 Assorted FT-243 45 Assorted FT-241A  
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**100 Crystals \$8.95**

Assorted.....Regular value \$66.00

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**35 Crystals \$3.49**

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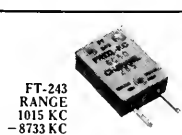
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HAM BAND CRYSTALS — FT-243

For operating on 80, 40, 20, 15, 10, 6 and  
2 meters—on either fundamentals or  
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FT-243  
RANGE  
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- 8733 KC



FT-241A  
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- 538 KC



FT-171B  
RANGE  
2030 KC  
- 3995 KC



CR-1A  
RANGE  
5910 KC  
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Low Frequency — FT-241A for SSB, Lattice  
Filter etc., .093" Pins, .486" SPC, marked in  
Channel Nos. 0 to 79, 54th Harmonic and  
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49¢ each — 10 for \$4.00	79¢ each — 10 for \$6.50
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372 394 415 484 507 530 440 461	4080 5397 5900 6706 7583 7873
374 395 416 485 508 531 441 462	4165 5435 5906 6725 7600 7875
375 396 418 487 509 533 442 463	4190 5437 5925 6740 7606 7900
376 397 419 488 511 534 444 464	4280 5485 5940 6750 7625 7906
377 398 420 490 512 536 445 465	4340 5582 5973 6775 7641 7940
379 401 422 491 513 537 446 466	4397 5660 6206 6800 7650 7950
380 402 423 492 514 538 447 468	4445 5675 6225 6825 7660 7975
381 403 424 493 515 448 469	4490 5700 6250 6875 7675 8250
383 404 425 494 516 450 470	4495 5706 6273 6900 7700 8273
384 405 426 495 518 451 472	4450 5677 6240 6850 7673 8240
385 406 427 496 519 452 473	4490 5700 6250 6875 7675 8250
386 407 431 497 520 453 474	4495 5706 6273 6900 7700 8273
387 408 433 498 522 454 475	4450 5677 6240 6850 7673 8240
388 409 435 501 523 455 476	4490 5700 6250 6875 7675 8250
390 411 436 502 525 456 477	4495 5706 6273 6900 7700 8273
391 412 438 503 526 457 479	4450 5677 6240 6850 7673 8240
392 413 481 504 527 458 480	4490 5700 6250 6875 7675 8250

79¢ each — 10 for only \$6.50

CR-1A SCR 522-1/2 Pin, 1/2" SP	FT-171B Banana Plugs, 1/2" SPC	BC-610
5910 7350 2030 2220 2360 3202 3850	1015 6100 6540 7150 8150 8500	3655 6106 6550 7250 8173 8525
6370 7380 2045 2258 2390 3215 3945	3680 6125 6573 7300 8175 8550	3735 6140 6575 7306 8200 8558
6450 7390 2065 2260 2415 3237 3955	3800 6150 6600 7325 8225 8566	3885 6173 6606 7340 8340 8575
6470 7480 2082 2282 2435 3250 3995	3940 6175 6625 7350 8350 8583	3990 6185 6640 7375 8360 8600
6497 7580 2105 2290 2442 3322	6000 6200 6650 7400 8370 8625	
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6610 2155 2320 2557 3550		

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S-95 S-94

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## HAMFEST CALENDAR

**ALABAMA** — The North Alabama Hamfest will be held this year on Sunday, August 28th, in the Tri-Cities — Florence, Sheffield, Tusculumbia. Something planned every minute. You are welcome to yak and chew the rag with your old buddies, but if you want entertainment it will be there. Ask the fellow who came last year to Decatur! He'll be back! Phil Lawrence, W4DGN, P. O. Box 9, Decatur, Alabama, is the ticket man. \$1.00 attendance, meal tickets available.

**ARIZONA** — The Ft. Huachuca Amateur Radio Club will sponsor a hamfest at the Army Electronic Proving Grounds on September 3rd, 4th, and 5th.

The Army air strip will be available for civilian planes, but it will be necessary to sign a waiver releasing the Army from responsibility; 5 10-5 insurance desired if possible. Overnight camping facilities available. Motels are also nearby. There will be activities for the XYs and children. Some playground facilities are at the picnic area.

**IDAHO** — The annual WIMU Hamfest will be held August 5th, 6th, and 7th at Big Springs, Idaho. The registration this year is expected to exceed 250. Rex Roberts, W7CPY, the Northwestern Division Director, will be in attendance, and a large number of radio clubs in the four-state area will be represented. For further info contact W7BAR.

**ILLINOIS** — Sunday, August 14th at Mance Park, ¼ mile east of Route 45 and ¼ mile south of Route 66 (Stinson Airport) the 21st Annual Picnic and Airmobile Meet of the Hamfesters Radio Club. The friendliest get-together in the Midwest. Planes can home in on WTAQ frequency 1300 kc. Four towers at this radio station are 190 feet tall. Planes parked free, but pilots must bring their own tie-downs. Food, ice cream, and beverages available. Games and contests for kiddies and grown-ups. Plenty of tables and free parking. Donations are \$1.00 in advance and \$1.25 at the gate. Tickets available from Jesse P. Markham, W9YNV, 37 No. Lotus, Chicago 44, Ill.

**INDIANA** — The Tri-State Amateur Radio Society will hold its 9th annual Hamfest on Sunday, August 28th, at Bowers Grove which is located 8 miles north of Evansville and 2 miles west of Grumpy Pals on Highway 41. There will be large signs posted along the highway and there will be transmitters on 10 and 75 meters to direct all comers to the grounds which will have plenty of shade and a screened-in shelter house. The activities will start at 10 A.M. CDST with games and contests for all members of the family. A basket dinner will be held at noon with refreshments available on the grounds. The registration fee will be \$2.50 per person. For other info, contact Callie Jones, W9UHV.

**MAINE** — The Annual Hamfest will be held at Stevie's, W1BOK, August 14th, at Dexter in the heart of Maine. The usual good feed will be served at noon. A dual mobile hunt with two hidden transmitters will be the feature of the day. Group meetings will be held during the day for various nets, such as Drag Net, Barnyard Net, Sea Gull Net, etc. This is the only large hamfest in Maine this year, so plan to attend. Reservations can be made with W1BOK, Stevie, in Dexter or with W1BPI, Al, in Casco. Let's go, gang. Come meet your old friends.

**MINNESOTA** — The St. Cloud, Minn., Radio Club is holding its annual amateur family picnic on August 28th. It will be held at the Sauk Rapids City Park. Come and meet the gang there. It begins at 1 P.M. CST. Games for YLs and children. If further information is desired, contact Jack Maus, W0MBD, 417 — 8th Ave., South St. Cloud, Minn.

**OHIO** — The Buckeye Shortwave Radio Association, Akron, Ohio, will hold its annual picnic Sunday, August 28th, at Happy Days camp in Akron Metropolitan Park. Games for the children, and fun for the YL or XY. An outstanding event in Ohio in past years, it promises to be even bigger and better this year. Registrations start at 12 noon daylight time. \$2.00 per family. Reach the park via Peninsula Road west from Ohio 8, east from U. S. 21, or via Sand Run Road north from Ohio 18. 3860 and 29,560 will be monitored to direct mobiles. Further info from WSVQI or WSWAV.

(Continued on page 136)

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heavyweight  
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A big 2 meter success story  
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PERFORMANCE, PORTABILITY, PRECISION

2-METER STANDARD COMMUNICATOR  
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115V AC/6V DC. #3026 . . . 209.50

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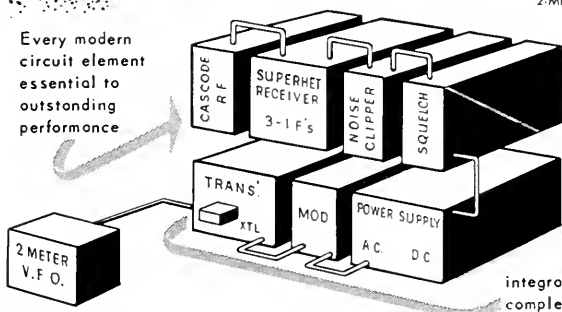
6-METER DELUXE COMMUNICATOR  
115V AC/6V DC #3049 . . . 229.50  
115V AC/12V DC #3058 . . . 229.50

2-METER VFO . . . #3024 . . . 84.50

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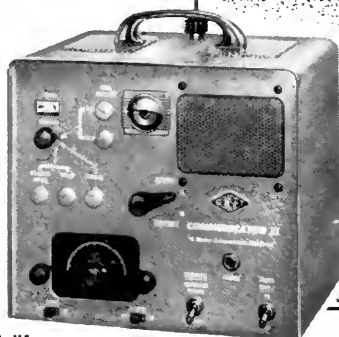
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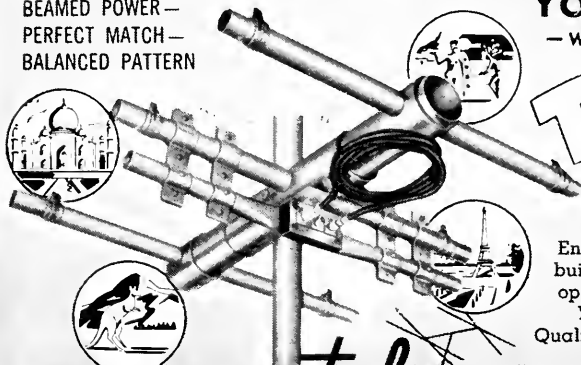
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**PENNSYLVANIA** — Pittsburgh Hamfest, Sunday, August 7th, at Totem Pole Lodge in South Park. Save 25% by registering in advance. Send check for \$1.50 to William E. Guthrie, 4949 Roberta Drive, Pittsburgh 36, Penna. Tickets are \$2.00 after July 22nd. This is the 17th annual Hamfest of the South Hills Brass Pounders and Modulators.

**VIRGINIA** — The Shenandoah Valley Amateur Radio Club Inc. of Winchester, Va., will hold its annual Hamfest on Sunday, August 7th, at Dickey Ridge on the Skyline Drive near Front Royal, Va. Registration fee is \$1.00 and lunch will be served for \$1.25. For information, write Richard E. Rush, WN4HXB, Secy., at P. O. Box 139, Winchester, Va.

## Correspondence

(Continued from page 51)

% WFO  
Farmville, Va.

Editor, *QST*:

For years it has been a pleasure to scan the diagrams printed in *QST*. That is, until recently — the henscratching which seems to be the current vogue could, in my opinion, provide satisfaction only to a power engineer or an Egyptian stone cutter.

If this is progress I, for one, would prefer to remain static in this instance and let the power people conform to the communication standard if they should so desire. If not, let them wallow in a maze of hieroglyphics and leave us be.

— C. K. Chrismon, W4GIW

73 Mather Ave.  
Groton, Conn.

Editor, *QST*:

I cannot understand what all the fuss over the new symbols is about. It is axiomatic that we go ahead or fall behind. Any move to keep the ham informed is a good one, in my estimation. Would suggest to draftsmen that larger dots at junctions would be easier for the eye to follow a circuit. . . .

— Thomas S. Paterson, WITVN

276 Monmouth Ave.  
New Milford, N. J.

Editor, *QST*:

Glancing at the "Correspondence" column of the July *QST*, it became apparent that not too many members are in accord with my feelings on the new circuit symbols. My advice to these people is [censored]! The new symbols are certainly no violent change. Personally I like them. Keep up the good work. At least I appreciate it!

— J. Herm Rickerman II, K2HXP

## QSL DOGHOUSE

76 Highland Road  
Glen Cove, L.I., N. Y.

Editor, *QST*:

When I read of WØPDN writing to excuse some peoples' QSL peculiarities (May *QST*) it was with some effort I restrained my desire to take pen in hand.

Now that W3EQK (July *QST*) has arisen I must rush to defend VQ3CP (both his 'phone and c.w. QSLs came here air mail) and VQ2DT (his 'phone and c.w. cards for several bands arrived promptly) — we also have two cards from EA9DC — but I do share EQK's idea of a particularly appropriate doghouse for —, —, —, —, several "prominent" W1 and W6 "high scorers," and some

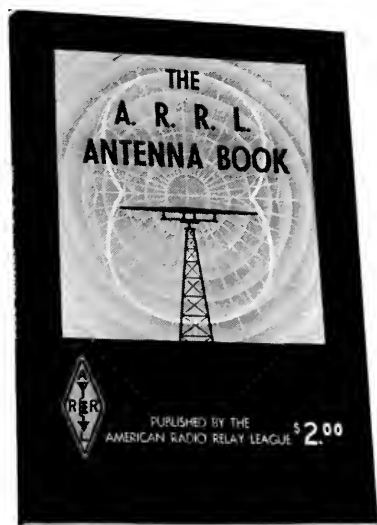
(Continued on page 138)

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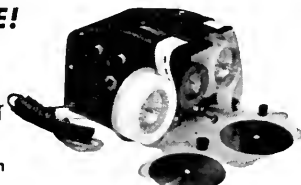
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more (fortunately really few) outstanding exponents of the maturity theory of self election to the "untouchable non-QSL caste."

— J. Albert Stobbe, W2WZ

39 Sobro Avenue  
 Valley Stream, N. Y.

Editor, QST:

Read W0PDN's letter in May QST with considerable interest. He refers to an ET2 station. . . . I don't think that W0PDN has much experience in the QSL rackets as they exist today. This station is one of a number of rare ones that periodically show up on the bands and work 5-600 stations, mostly Ws and then never QSL — except to DX editors and prominent hams, for obvious reasons. Now . . . my question is: What do they do with the International Reply Coupons?

— Theodore J. Seiter, W2FJH

P. O. Chileka  
 Nyasaland

Editor, QST:

I've had more than a little correspondence with various stations, mostly Ws, who have sent me QSLs, claiming QSOs which have not taken place. I have returned the cards to the senders.

Some time ago, I informed W9BRD of the stations who qualify for my blacklist. Maybe it's a coincidence that these hopeful QSL seekers make up the greater part of this list.

One W3 gentleman waxed indignant in a letter to me, after I had returned his card. In it, he states that DX stations only reply to the "kw. and beam" fraternity and that W QRP stands no chance of working the DX. If he had the opportunity of scanning my QSL files, he would see that over half my W cards are for QSOs with stations using 150 watts and less. This self-same W3 was responsible for ruining a QSO with a much wanted EAS, by carefully zeroing the latter and calling me as I stood by to pull the EAS through the racket. How crazy can one get?

To cap it all, this W3 fella says "why do you work a W more than once and why don't you keep the QSOs snappy when there are lots waiting?" It would be funny if it weren't tragic. As an example from my log on Nov. 16, 1954, I worked 47 W fellas in 110 minutes. If that isn't good enough, I'll apologize for being a slow operator. As for the number of times I QSO any particular W, I guess that's my business. There are some Ws, in particular, with whom a QSO is a pleasure indeed, when I feel like more than a mere exchange of RSTs and 73.

Finally, just a reminder — let's not forget that remote stations are keen on DX themselves and do not exist solely to provide fun for Ws and Gs. I've held VS7, VS1 and G calls since the end of '45 and therefore have been on both sides of the DX fence. It's flogging a dead horse, I know, but how fine it would be if the over-eager beavers would be a little more patient and keep their fingers off the bug until they know the DX station is ready for a call.

That's my little piece. Good huntin' to the savvy boys and may the others learn the error of their way.

— Vic Thorne, ZD6BX

## TV INTEREST

1465 N. Villere St.  
 New Orleans 16, La.

Editor, QST:

I read with interest the article on TV servicing in the June issue of QST. While I realize that QST is supposed to be "of, by and for the radio amateur," I think such articles are timely and of interest to a large portion of the ham fraternity. . . .

I think more such articles from time to time would improve QST.

— A. L. Maurin, W5MXP

R.F.D. No. 1  
 Glastonbury, Conn.

Editor, QST:

Many thanks for the article, "Elementary TV Trouble Shooting," by W7MID in June QST. "Best" covers a lot of territory, but this one is certainly one of the best in QST for some time, and this issue will be especially marked on the binding, as are some others, for ready reference. I think that space in QST was very well used.

— Bun Doubleday, W1UJA

# HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns, nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature, and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply. To expedite handling of your copy please state whether you are a member of ARRL.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred, but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

*Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.*

**QUARTZ**—Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

**MOTOROLA** used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

**WANTED:** Cash or trade, fixed frequency receivers 28 42 Mc W9XIV, Troy, Ill.

**WANTED:** Early wireless gear, books, magazines and catalogs. Send description and prices. W6GII, 1010 Monte Drive, Santa Barbara, Calif.

**CODE** slow? Try new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

**SUBSCRIPTIONS:** Radio publications. Latest Call Books, \$4.00. Mrs. Earl Mead, Huntley, Montana.

**URGENTLY** need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

**OUTSTANDING** ham list always. Our prices on trade-ins of all amateur brands are realistic and down to earth. We feature Johnson National, Collins, Hallicrafters, Gonsert, Elmac, Harvey-Wells, Morrow, Central Electronics and other leaders. We trade easy and offer our own time-payment plan tailored to fit you. All leading brands of new equipment always in stock. Write today for latest bulletin. Stan Burghard, W9BJV, Burghard Radio Supply, Inc., Box 41, Watertown, S. Dak.

**ANTENNA** for bandswitching transmitters up to 300 watts input, approx. 120 feet long, centered with 75-ohm line, 70 feet included, low SWR, tunes 80–40–20 meter bands. U. S. Patent 2,535,298. Each one tested for resonance on all bands. Send stamp for details. \$18.95 each. Latin Radio Laboratories, 1431 Sweeney St., Owensboro, Ky.

**MICHIGAN HAM!** Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel. 8-8696, No. 8-8262.

**2-METER** aluminum Brownie beams, \$22 and up. Write to H. W. Snyder, W3LMC, 4330 Glenmore Ave., Baltimore 6, Md.

**WANTED:** All types aircraft & ground transmitters, receivers, ART-13, RT18/ARCI, R5/ARN7, BC610E, BC221 mounts and parts wanted. Fairest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

**ATLANTIC** City vacation! Commodore Hotel, Kilowatt accommodations at low power prices. Luxury rooms with bath and radio. Budget special rooms with running water. Write for information and reservation. Ben Robin, W2BIG, Manager, Commodore Hotel, 715 Pacific Ave., Atlantic City, N. J.

**WANTED:** Bargains in transmitters, receivers, laboratory and test equipment, also miscellaneous and unusual gear, etc. What have you? Please state price desired. Especially interested in husky power supplies, large filter chokes and condensers, etc. Also need plate transformers putting out about 4,000 V or more each side center. Harold Schonwald, W5ZJ, 718 North Broadway, Oklahoma City 2, Oklahoma.

**LEECE-NEVILLE** 6 volt system, 100 amp. alternator, regulator & rectifier, \$60.00. Also Leece-Neve 12-volt system 100 amp. alternator, regulator & rectifier, \$85.00. Good condition. H. A. Zimmermann, 570 Jamaica Ave., Brooklyn 8, N. Y. Ulster 2-3472.

**NEW** and used Motorola, Link, RCA, G-E, etc., FM commercial communications equipment bought & sold. Allan M. Klein, W2FOU, 95-33 225th St., Bellerose, L. I., N. Y. Phone FL 4-394.

**VAN SICKLE** has the new or used gear. Taylor 866As, \$1.95. Gene, W9KJF, 1320 Calhoun, Ft. Wayne, Indiana.

**OUTSTANDING** QSL samples 10¢ (refunded). "Rus" Sakkars, W8DED, P.O. Box 218, Holland, Mich.

**QSLs!** Samples, dime. Printer, Corwith, Iowa.

**QSL-SWLS:** Meade W0KXL, 1507 Central Avenue, Kansas City, Kans.

**QSL-SWLS:** Samples free. Backus, 5318 Walker Ave., Richmond, Va.

**QSLs, SWLS, America's Finest!!!** Samples 10¢. C. Fritz, 1213 Briar-gate, Joliet, Ill.

**QSL-SWLS:** 2-color: 125 for \$2.00. Samples 10¢. Bob Garra, Lehighton, Penna.

**QSL-SWLS:** 100, \$2.85 up. Samples 10¢. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

**QSLs:** New Designs; 2-call and photo cards. Star Printing, 130 S. Glenoaks, Burbank, Calif.

**QSLs:** Nice designs. Samples. Besesparis, W3QCC, 207 S. Balliet St., Frackville, Pa.

**QSL:** The kind you want. Graphic Crafts, Route 12, Ft. Wayne, Ind.

**QSLs:** Attractive. Inexpensive. Samples free. W3EHA, Cy Jones, 840 The Terrace, North Hagerstown, Md.

**QSLs:** Modern designs and craftsmanship. Samples 10¢. Tooker Press, Lakehurst, New Jersey.

**QSL Specialists:** Distinctive. Samples free. DRJ Studios, 1811 No. Lowell Ave., Chicago 39, Ill.

**DELUXE QSLs**—Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10¢.

**100 Free QSL cards** with order. Samples 10¢. World Printing, 166 Barkley, Clifton, N. J.

**QSL-SWLS:** Samples free. Bartoski, W1YHD, Williamstown, N. J.

**QSL-SWLS:** Cartoons, Rainbow, others. Reasonable. Samples 10¢ (refunded). Joe Harms, 225 Maple Ave., North Plainfield, N. J.

**QSLs** of distinction! Three colors and up. 10¢ brings you samples of distinction. Uncle Fred, Box 86, Lynn, Penna.

**QSLs:** Samples free. Albertson, W4HUD, Box 322, High Point, N. C.

**QSLs!** Two colors, \$2.00 hundred. Samples for stamp. Rosedale Press, Box 164, Asher Station, Little Rock, Ark.

**QSL "Brownie"** W3CJ1, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

**QSL-SWL cards:** Sensational offer. Bristol stock 500 1 color \$3.95, 2 color \$4.95, 3 color \$5.95. Super gloss \$1.25 extra. Rainbow cards. Samples 10¢. QSL Press, Box 71, Passaic, N. J.

**QSL samples:** Dime, refunded. Roy Gale, W1BD, Watford, Conn.

**QSLs:** Postcard brings samples. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

**QSL-SWLS:** Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

**QSLs:** Distinctively different. Postpaid. Samples free. Dauphinee, K6JCN, Box 66009, Mar Vista 66, Calif.

**QSL-SWLS:** Varicolored, specialist, 10¢ samples. Snyder, W9HIU, 113 Harrison, Jeffersonville, Ind.

**UNUSUAL! Vivacious!** Illustrated QSLs, typolithographed. Free samples. WAT, Box 128, Breckville, Ohio.

**QSLs:** Something new—Different—All printed in 3 colors or more on glossy stock, \$3.85 per 100. Preference when ordering such humorous, plain or modern. Be surprised. Satisfaction guaranteed. 2-day service. Constantine Press, Bladensburg, Md.

**PITTSBURGH** Hamfest: Sunday, August 7, 1955, at Totem Pole Lodge in South Park. Save 25% by registering in advance. Send check for \$1.50 to William E. Guthrie, 4949 Roberta Drive, Pittsburgh 36, Pennsylvania. Tickets are \$2.00 after July 22nd. This is the 17th annual Hamfest of the South Hills Brass Pounders and Modulators.

**NATIONAL** receivers SW-54, NC-88, NC-98, NC-125, NC-183, HRO-60 in stock. Attractive swaps or trades for used ham receivers and surplus equipment. Dynamators—6 VDC/420 VDC 280 Ma., good used, \$12.95; 12 VDC/400 VDC 500 Ma. including filter base, starting inductor, excellent, \$16.95; surplus RG-8/U cable, 100 ft., \$5.95; 250 ft., \$13.25, 500 ft., \$25.00. Free Bargain Bulletin. Visit store for our unadvised bargains. Lectronic Research, 719 Arch St., Philadelphia 6, Penna.

**PRINTED** circuits made from your drawings. Etched circuit supplies. Rowe Engravers, 492 East 39th St., Paterson, N. J.

We will be looking for you at the ARRL Central Division Convention at South Bend, Indiana, October 15–16 are the dates. This will be the Big One for 1955! Advance registration \$3.50. Write to Box 551. Make checks payable to Central Division Convention. Do it now!

**UFO** data compiled, W5CA.

**SELL:** Model 12 teletype with cover, table, keyboard and AC motors. Also W2BFD for extra. All in excellent condx. W3MKZ, 87 College Ave., Annapolis, Md.

**SELL:** Receiver, NC-128X, in gud condx, just aligned; \$65; xmitter Parallel 807s, 80–40–20 meter coils, relays, xtal, TVI-suppressed. 100 watts, \$125, K2EVW, 307 No. Thurlow, Margate, N. J.

**SEE** you at Hamfesters Radio Club 21st. Annual Picnic and Air-mobile Meet at Mance Park near Chicago on Sunday, August 14th. Donations \$1.00 in advance, \$1.25 at the gate. W9ECY, Sec'y., 8908 So. Constance, Chicago 17, Ill.

**W5AXI/MM** correct mailing QTH Arthur E. Hutchins, R OSS Fullerton Hills, Bernuth Lembeck Co., 420 Lexington Ave., New York 17, N. Y.

**PANORAMIC** Adapter, AN/APA-10 tech. manuals: \$2.75 postpaid in U. S. A. Electronicraft, Bronxville, N. Y.

**WANT:** NARCO Aircraft Omnimirage, etc.; have Hallicrafters S-39, S-36, BC-611C Handi-Talkies. W1QHC, Barfield, 4 Brinsley St., Dorchester 21, Mass.

**HAMMARLUND** HQ-129X for sale. In perfect electrical, physical and mechanical condx. Late model. Has HQ-140X bandspread dial (covers 15 meters). \$165 or best offer. Dave Smith, K2CHS, 54 Butler Road, Scarsdale, N. Y.

**HRO** Crystal calibrator, as new, \$15. W3BFF.

MIAMI or vicinity, for sale or trade, complete xmittr, 600 watts, bandswitching, parallel 813s, pi-net final, pi-net antenna tuning after lowpass filter, complete break-in with duplex keying, AM phone (green), fully metered, enclosed metal cabinet, VFO, 807, 807, 813s for \$225, or trade for 4 x 5 camera and equip. Pick up any QTH. W4EN, 433 DeSoto Dr., Miami Springs, Phone 88-8117.

HOME study course commercial first class ticket, half price. Bill Norman, Box 868, Raton, N. M.

COMPLETE Station, \$150. F.o.b. Ventura, Calif. Hallicrafters SX25 recvr, matching spkr, AT1 xmittr, AC1 antenna coupler, VF1, VFO, all Heathkit. Assembled and work perfectly. Will substitute Super Pro Sp210 receiver (BC779) for \$225 more. K6GGM, Rube Kaplan, 3150 Armada, Ventura, Calif.

RESISTORS 2 each all RETMA 10% values 1/2 watt RC21 total 154 new. No surplus, \$6.50 postpaid, U. S. A. Aymond, W5UHV, 7125 Meadow Lake, Dallas, Texas.

SELL: SWR indicator. Leave in transmission line, negligible insertion loss. Handles 2 to 500 watts. Requires 0-1 Ma. meter. For \$2 ohm coax, 160 to 10 meters: \$15.00. Bill Morgan, W4HGE, 3870 N.W., 64th Ave., Miami Springs, Fla.

SELL: Most all issues of QST from 1939 in original condx; IRE Proceedings from 1948. Make offer. C. H. Willard, W2E2B, 2023 Baker Ave., Utica, N. Y.

WANTED: Pierson-DeLane PR-15 receiver. "Griff", Box 4522, University Station, Tucson, AR.

ALASKA Bound: SCR-522 with tubes and dynamotor, less crystals. MK II transceiver, 2-8 and 229-241 Mc/s (convert to 2) SCR-583 (needs repair) with book and PE-152. First reasonable offer accepted. Tilleman, 8409 Tibet, El Paso, Texas.

FOR Sale: Collins 32V3 transmitter, excellent condx, \$475., with 35C2 low pass filter, 20C, Tetract 2-meter converter, 26 Mc to 30 Mc, i.f., never used, \$25; 3-el, 20-meter shortbeam, nearly new, \$35; 32-el, U.H.F. Resonator collinear; 2-meter beam completely chrome-plated \$38. New, never used. You pay shipping charges. K. W. Ring, 239 E. Main Rd., Conneaut, Ohio.

URGENTLY need coil sets "C" and "D" for HRO-5. These will then complete emergency equipment here. Must be in tip-top shape. All offers prompt QSL. W0MCL/1, Box 95, Waquoit, Mass.

FOR Sale: Like new 32V2 with spare 4D32 tube, \$425.00; Wilcox CW3 receiver xtal controlled on WWV 10 Mc, \$35; James Knights 1000 kc-100 Kc-10 Kc frequency standard, \$35; DB20, \$15. All prices are F.o.b. Peoria, Ill. Claude Moore, W9HFL, 1201 Lehmann Bldg., Peoria, Ill.

RECEIVERS-Transmitters, repaired and aligned by competent engineers, using factory standard instruments. Collins, Hallicrafters, Hammarlund, National. Our nineteenth year. Douglas Instrument Laboratory, 176 Norfolk Avenue, Boston 19, Mass.

FOR Sale: Collins 75A-3, all modifications, equal new condx, \$399. Will ship; Millen R-9er with 20 and 10 coils, new condition, \$12.75; Telrex 3-element 10, new, \$57.50; 3 cl. 15, used only 3 months, \$85. Will ship. W4FPS, Leonard, Box 2366, Roanoke, Va.

WANT: 32V2 or 32V3 xmittr. Cash for the best deal. Write to Box 516, Stryker, Ohio.

FOR Sale: Complete station: RME84 receiver plus Q5'er and Eldico TR75TV transmitter including one xtal, now in operation and in gud condx. \$100. Complete. Prefer local sale. Vince Fitzgerald, W2IBQ, 317 Pittsburg Ave., Massapequa Park, L. I., N. Y.

WANTED: NC-101X in gud condx; will pay \$65 cash. K2KLL, 1514 E 10th St., Brooklyn, N. Y.

1200 mile move in August says "sell!!": KW phone/c.w. 160 thru 10; NC183D, 2-Kw power supply; xformers. Prefer local area sale. W9OUF, 138 Chandler Blvd., Macomb, Ill.

FOR Sale: Supreme AF1000 with 4-65A final, \$225; SX42 with R-42 speaker, \$185; BC342 with spkr and AC power, \$65; BC221 with audio and AC supply, \$75; Astatic T-3 mike with push-to-talk stand, \$15; Gonset 10 meter converter, \$10; Telrad frequency standard, \$20; Erco beam rotator, \$30; Webster Electric PA System 50 watt, \$25. Chathfield, W4BXC, Redstone Arsenal, Huntsville, Ala.

FOR Sale: Meissner Traffic-master receiver, K2QCS.

WHY buy substitutes when almost brand-new equipment is available below dealer's cost? Collins 32V-3 and 75A-2-A with factory installed mechanical filter, FM adapter and xtal calibrator, including 800 cycle and 3 Kc filters. Matching speaker in original factory carton, guaranteed factory tested and hardly used. Brand new extra 4D32 tube included. Price: \$895.00 complete F.o.b. Cedar Rapids, Iowa. Write or wire Charles W. Boegel, Jr., W0CVP, 1500 Center Point Road, NE.

SALE: Lysco 600, also AM modulator. Roger Simmons, Ashland, Ohio.

M0VED: Chassis, good, new and used ham parts: \$1.50 grab-bag postpaid, Mel Stricker, 233 Kelton St., Allston, Mass. Photos of extra gear.

TELEVISION Hams! TV excitors, 1-link type, 2056; R.F. wave-form monitor type 287; Monoscope 2506, complete, 1-link 12 volt pow r supplies, \$18; Mobile receivers 2/4 Mcs. and 30/40 Mcs, \$10, looking for Gonset Communicator or other ham gear. W2OEA, Higley, 7-6 Sheridan Ave., Roselle, N. J.

FOR Sale: Back issues of QST, 1924 thru 1932 in yearly binders; 1933 thru 1953 without binders. Sell by year only. What do you bid? R. F. Steinert, W8NY, 16507 Lilac, Detroit 21, Mich.

VLRI Directory for 1955 now available. Useful to seekers of VLIC and WAS/YL certificates. Send \$1.00 to G. Eastman, W6DXI, 735 Glen Ave., Glendale 6, Calif.

SELL: HQ-129X, speaker, original cartons: \$122. Globe Scout transmitter, like new, with BC459A VFO, \$65.00. F.o.b. New York. Irwin Hyman, 12 West 87th St., New York City.

SELL: 32V1 and 75A1, in excellent condx, \$600. F.o.b. Royal Oak, Mich. L. Opalka, W8WBG, 721 N. Main.

SE11: Complete 125 watt modulator; \$55; modulating monitor \$15; 576 Hallicrafters, \$115; 250-watt 813 rig, fone/c.w., bandswitching 160-10, push to talk, step to send, many other conveniences. Attractive unit complete with Heathkit VFO and extras. Sacrifice at \$200. Need money for college. Belin, W9GXI, 3441 Douglas St., Sioux City, Iowa.

1 KW xmittr, two 250TH r.f. final; 210 watt driver; Welco oscillator, Meissner signal shifter, 500-900 watt modulator; four 201Z or 1740 to 1500 watt modulation transformer; two 807 drivers, Masco speech ampl. driver; 100TH instead of 250TH may be used without changing anything. 2800 VDC 500 Ma. filtered (r.f.) 1300 1850 VDC 500 Ma. filtered (speech) plus all power supplies for drivers; all R.F. stages metered; 80-10 meters with all coils; 1 Kw antenna coupler. TVI-suppressed, in excellent condx. Write W0QIY, 3601 Osceola St., Denver, Colorado.

COMPLETE 12-volt mobile system; all equipment in excell. condx and only 7 months old. Includes Elmac AF-67, Gonset Super-Six and noise-clipper; Shure 102C mike, coax relay, Master Mobile Mount antenna and spring mount, Model 666 allband coil; PE-101C dynamotor with filters and relays mounted in base, an 1 Morrow generator noise filter. Complete. \$180. Separately, a little more. K2JZT, Adolph, 8 Bridge St., Sidney, N. Y.

FOR Sale: Meissner 150-B transmitter, 250 w. 813 final; 1.5 to 12.5 Mc. converted to cover 10 m. and 120 m. bands; TVI suppressed. Single switch on front panel changes to 250 w. SSB final. Hear it on 75 mornings or week-ends. Price: \$250 with mike, key and spare parts. J. Taylor, W2OZH, Stanwood Rd., Mt. Kisco, N. Y.

WANTED: BC-348 or comparable receiver located in or near New York State or Ontario. VE3DTN, Stock, Collins Bay, Ont., Can.

TRADE: Bolex H-8 movie camera, 3 lenses in turret, case, extra spools, instruction book (cost over \$400 new) for all-band xmittr and recvr. W0FUB, 707 43rd St. N.E., Cedar Rapids, Iowa.

FREE list: parts, gadgetry, meters, oddities. Art Sorrell, W3AXG 6310 63rd Pl., Riverdale, Md.

CLEANING: House! Collins 75A2, \$325; factory-built sideband switch with AP-1, \$65.00; Stancor 500 watt modulation transformer 1:1, \$30.00; new Triplett #650 VTM, \$35; like-new factory-built Viking Kager with tubes, \$220. List on request. W9WQE, E236 Ave., Omaha, Neb.

GOLD Lettering, black buckram binding, special low prices, QSTs, seven volumes: 1934, 1935, 1936, 1937, 1939, 1940, 1944. L. A. Morrow, W1VG, 99 Bentwood Road, West Hartford 7, Conn.

BARGAINS: With new guarantee: R-9er, \$12.50; SW-54, \$29.95; S-38C \$35.00; S-403, \$79.00; Lysco 600, \$99.00; S-27, \$99.00; SX-43, \$129.00; S-76, \$149.00; SX-71, \$169.00; SX-42, \$169.00; HRO-50, \$275.00; Ellico TR75TV, \$39.50; Heath AT-1, \$22.50; Meck T60, \$49.50; HT-17, \$29.95; EX shifter, \$39.50; Globe Trotter, \$49.50; Globe Champ, \$199.00; Harvey-Weils Deluxe \$69.00; Elmac A-54, \$199.00; Viking I, \$179.00; Viking II, \$229.00; S-75, \$169.00; HT-9, \$139.00; Globe King 400B, \$325.00; 32V1, \$375.00; 32V2, \$425.00; 32V3, \$525.00. Free trial. Terms financed by Leo, W0GFI. Write for catalog and best deals to World Radio Laboratories, 3415 West B'way, Council Bluffs, Iowa.

HI Voltage components, parts for complete 813 rig. B&W low pass filter, etc. Special. Send for list. W3FYW.

FOR Sale: 75A2 with 3 Kc. mechanical filter, 32V2, Gonset 110 V. A.C. converter (rare), 6-10-15, Raymobile (75 meter) antenna, model 15 teletype, keyboard perforator; magazines: Electronics, Communications, Communications since 1926, less 2 issues; QST, less 11 issues; RCA Review, less 1 issue. Write Fred G. Schmidt, W4NVP, Box 4946, Ft. Lauderdale, Fla.

TRADE: 222 Remington Rifle with 2" Unertle ultra Varmint scope for band-switching transmitter. Ed Muller, 1436 East 28th St., Brooklyn 10, N. Y.

FOR Sale: Immaculate ham station: equipment cannot be told from new. Original boxes and instructions with most pieces. Cleanest Viking II in country, professionally wired. Used about 20 hours: \$225.00; HQ140X in same condx with matching spkr, original box, instructions, used 20 hours: \$225.00. Two excellent Johnson Match Boxes, \$39.00 each; Globe Scout 65, perfect, only about 10 hours operating time: \$79.00; B&W grid dip meter, new, \$29.50; NC57, new tubes throughout, very nice: \$49.00; Philco pocket scope, \$15.00, new Johnson lo pass filter \$11.00. Bruce Vaughan, W5HTX, Springdale, Ark.

K0AXM will trade Savage 22 Hornet 6-shot rifle with scope in A-1 condx for a good mobile transmitter and receiver or converter. Jim Pixler, K0AXM, Zimmerman, Minn.

LEECE-Neville 100 amp alternator with ammeter. Ford mount. \$85.00 or trade for G-E, Motorola 2-way radio equipment capable modification to 6 meters. W7KKN, 10715 Villa Lane, Tacoma, Washington.

2 Meter beams: 6 element, horizontal or vertical, all seamless aluminum, \$6.95 prepaid. Wholesale Supply Co., Lunenburg, Mass.

COLLINS 75A2 with speaker and 100 Kc xtal, \$350; Viking II with VFO, L.P., filter, coax relay and mike, \$300.00. W3FVD, Mason, 1410 Holly St., N.W., Washington 12, D. C.

MEISSNER 150B, \$225.00, in excellent condx, 160 thru 20 meters, phone or c.w., TVI-suppressed. Will deliver anywhere in New England. E. Bosselman, W1OUZ, 79 Sanderson Ave., Dedham, Mass. Tel. DEdham 3-1348R.

WANTED: ART-13 transmitters. Write B. Spivey, 3117 Rolling Road, Chevy Chase, Md.

BARGAINS with new guarantee and completely reconditioned: S38; \$29.00; S40A, \$69.00; S40B, \$79.00; S76, \$129.00; SX71, \$159.00; NC98, \$119.00; HQ140X, \$219.00; TB550D, \$79.00; Meissner EX, \$39.00; Viking II, \$239.00; Viking WFO, \$39.00; HQ-129X, Sp400X, NC125, NC181D, NC240D; HRO60, AR88, 75A1, 75A2, 75A3, 32V1, 32V2, 32V3, PMRA, AF67, Super 6, Commander, B&W 5100, many others cheap. Shipped on approval. Easy terms. Satisfaction guaranteed. List free. Henry Radio, Butler, Mo.

FOR Sale: 6-volt power pack (Palco) 500 volts, 225. Ma., second Hi voltage 200 to 300 built-in relay, etc. Almost new. Reason for selling: now using 12 volt, same type, 10 meter close spaced. Hy-Lite beam in gud condx: \$15.00. W9LQI, Ashton, Illinois.

CASH for AN/ARC-1, BC-610E, BC-614E, BC-939, BC-729, BC-221, TCS and instrs. Also Sig. Corps, Navy, Air Force stock catalogs; maint. and instr. TM's for war surplus equipment. Amber Co., 393 Greenwich St., New York 13, N. Y.

SUPER DX Transmitter, estate of W2C2V; 8005s driving 450THs. Power supplies, etc., in 6 foot rack; Collins 75A2 receiver; Sonar FM exciter, etc. Stamp for list. Mrs. Braman, 84-17 Jamaica Ave., Woodhaven, L. I., N. Y.

WANTED: Waters Conley BC1016 inked tape recorder in 1st class working condition. Please send details and price in first letter. R. J. Strohecker, W7NNR, 2959 S. W. Montgomery Dr., Portland 1, Oregon.

WANTED: Gonset 2-meter converter. W1WRJ, c/o ARRL, 38 LaSalle Rd., West Hartford 7, Conn.

NEED ARC-1s, Lou Athanas, P. O. Box 5878, Bethesda, Md.

SELL: Hallcrafters late model HT-9 transmitter, coils 10-20-80, 160-8125, 600; Meissner E-X signal shifter, turret strips 6 to 160 mtrs, \$45.00; Elmac A-54-H transmitter, 6 volt 200 450 volt vibrator supply; Shure C-10 mike, ant. relay, base spring mount, whip, cable, etc. \$120.00; Morrow 3-BR converter with built-in noise limiter, \$18.00. All gear is clean and in A-1 condx. F. N. Lambour, W3DCY, Nicktown, Penna. Tel: 14-W.

SELLING OUT: HQ-129X rcvtr with matching speaker, excellent, \$140.00; factory-wired C E Model A slicer, \$45.00; factory-wired C E 453 VFO, never used, \$40.00; Single 813 AM xmitter, TVI suppressed, 300 watts, 811 Class B modulators, all power supplied; VFO, gray rack mounting, professional. Make offer. W9YDO, Williams, 4847 N. 41st, Milwaukie 9, Wis.

WANTED: Multi-Match modulation transformer capable of 600 watts audio, also Amertran 6200 volt, 2 KVA plate xfmr. Vic Crawford, W1FYQ, RFD 5, Danbury, Conn.

SELL: HRO-MX with power supply, speaker, regular bandspread coils plus 3 low frequency coils including broadcast, \$125.00 or HQ-129X with speaker, \$145. Both recently realigned and in gud condx. BC453B QSer less pwr supply, \$12; Vibroplex bug, original type, \$7.00. Robert Arntz, W3VPI, Millersville, Penna.

CENTRAL Electronics: A slicer, \$59.95; 10A, \$99.95; Collins 32V1 \$385.00; 32V2, \$450.00; 32V3, \$550.00; Deltronic CD-144, \$99.95; Hallcrafters SX-18, \$69.95; S-20R, \$44.95; SX-24, \$74.95; S-29, \$44.95; S-38, \$29.95; S-40, \$59.95; S-41C, \$24.95; SX-42, \$179.95; S-53A, \$59.95; S-72, \$49.95; S-81, \$34.95; HT-17, \$39.95; HT-18, \$59.95; Hammarlund 4-11, \$34.95; 4-20, \$44.95; Harvey-Wells TBS-50C, \$69.95; TBS-50D, \$79.95; APS-50, \$29.95; VFO, \$37.50; Meissner I-X, \$44.95; FMX, \$4.95; Millen 90281, \$49.95; 90700, \$19.95; 90800, \$19.95; 90881, \$69.00; National HFS, \$99.95; S-57, \$69.95; NC-87, \$89.95; NC-46, \$59.95; S-57, \$69.95; NC-88, \$89.95; SW-54, \$34.95. Complete list of largest inventory used equipment in the East; write to Carl, W1BTF, Evans Road, Concord, N. H.

32V3 Collins 75A3, like new, with best B&W low-pass, xtal-cal., 1 Kc. and 3 Kc. filters, changeable letter neon sign, wonderful for shop window; very rare, \$100; Millen Exciter, \$20.00; low power L50 75-meter mobile xmitter, \$15.00; mill, all capitals, \$45.00; several items left from my July Ham-Ad. W2AD1D, 129 Midland Ave., Glen Ridge, N. J.

FOR Sale: Viking II and VFO: \$250.00. Less than year old. W8FLZ, Hollis Rocks, 584 Wash. Ave., Holland, Mich.

KILOWATT-PLUS plate transformers: \$10.50 and up. Write for list. Fenwick, W7VMP, 3127 No. 17th Drive, Phoenix, Ariz.

HALLCRAFTERS S36 Receiver \$100.00; Collins 32V2 with FM adapter, \$510.00; changeable letter neon sign, wonderful for shop window; very rare, \$100; Millen Exciter, \$20.00; low power L50 75-meter mobile xmitter, \$15.00; mill, all capitals, \$45.00; several items left from my July Ham-Ad. W2AD1D, 129 Midland Ave., Glen Ridge, N. J.

TRADE: complete lapidary outfit with all accessories, for xmitter, rcvtr, or other ham equipment. W8PCN.

.051 PERFORATED Aluminum sheet, 5/64" OD holes, 3/4" centers, 1/2 sq. ft., cut to size. Send for listing on Beams, Aluminum tubing, etc. Radcliff's, Fostoria, Ohio.

SELL or trade: BC-610, like new, with completely TVI-suppressed, bandswitching, pi-section, 4-250-A final; BC-614-E speech amplifier with built-in clipper-filter; also Collins 310-B exciter; pick-up deal only. Glen Richie, W4JGO, P. O. Box 26, Salem, Va.

WANTED: SX-62A, 5BR1, NC183D, SX-71, reasonable, cash. Adriance, Navy 115, Box 23, Fleet P. O., New York.

VIKING II, \$200.00; Heath OL-1 scope, \$20.00; Eico 360 sweep generator, \$25.00; Heath SG-8 signal generator, \$10.00; Revere T-900 tape recorder, \$125.00; Johnson Match-Box, \$35.00; SWR Bridge, \$7.50. Fred S. Eggert, W8FLI, 11833 Wisconsin, Detroit 4, Mich.

SELL: New and used Gonset mobile equipment; two and six meter Communicators, etc. I buy, sell and trade mobile gear. Will take gear in trade for your any and all. Polaroid Cameras and accessories. R. T. Graham, W1JTX, Box 23, Stoneham, Mass. Tel. ST 6-1966.

SELL: Globe-King 400-A, TVI suppressed; cabinet shielded, all leads filtered. Dual lo-pass filter on output; coils for 10, 20, 40, 80 mtrs. In excellent condx, with instructions manual. \$325.00. F.o.b. Shreveport, La. No trades. Going to medical school. Larry McColm, W5PTJ, 150 Carrollton Ave., Shreveport, La.

RECEIVER: Basically BC-348S, mounted in rack cabinet, includes power supply, speaker, clipper-filter, S-meter, Universal output transformer; \$85.00. Will ship. Gary B. Jordan, W8LWL, 621 West Schantz, Dayton 9, Ohio.

SALE or trade: 260 Sam's Photofacts with 20 binders, \$285.00; 2KW plate transformer, 110V-60 cy. pri. 6200V, etc. \$45.00; 2 chokes 24.5 hrs. 300 Ma., 5KV insulation, \$15.00 each; K-7 mod. final, transformer with screen winding, \$35.00; T-56/ART 2 R. 813s final, with tubes and dynamotor, \$65.00; T-23/ARC5 with tubes, \$22.00; HT-18 transmitter, \$65.00; 6- 829B tubes, \$6.50 ea; 20- 5763 tubes, \$1.25 ea; 6- 304TL tubes \$3.25; Jackson Tube Tester, Mod. 648, \$69.00; Hickok sweep generator, Mod. 610A, \$150.00. Interested in Viking, BW5100, DX100 or what you have you to trade. All letters answered. W8LAH, Box 547, Fostoria, Ohio.

SELLING: Collins 310C2, perfect, \$95.00; Millen 90801 band-switching exciter with tubes, looks good, electrically fair, \$50.00; Viking Communicator, Viking Ranger, W7VMP, 3127 No. 17th Dr., Phoenix, Ariz.

SELL teletype perforator, reperforator, 7" TV rcvr, \$30; new TC-10-F keyer, \$12.95; pair ARC-5 receivers with power supply, excellent, \$22.50. Send stamp for list. W9ERU, 2511 Burrmont Rd., Rockford, Ill.

HEATH AR2, AT1 plus 2 crystals and antenna coupler carefully assembled. No time for using, \$55.00. Johnson Match-Box, never used; \$45.00. Both offers delivered Mississippi East. T. Willis, Bettawood Rd., Norwalk, Conn.

PASS Amateur Theory Exams. Check yourself with sample FCC-type questions & Novice and General Class examinations. All for only 50¢. Ameco Electronics, 1203 Bryant Ave., New York 59, N. Y.

DELUXE Vibroplex, jeweled movement, carrying case; used very little. Best offer takes it. W0DFA, M. H. Gordon, Storm Lake, Iowa.

FOR Sale: Globe King "500"; original crate, unused: \$625.00. W5VRO, Hemlock 6-0025. James W. Craig, Jr., 3413 West Roosevelt Dr., Lake Charles, La.

FOR Sale: Old HRO, in gud condx, \$50; Miscellaneous collection of radio gear vintage 1940 and older, some antique. Two racks, RF and audio, with power supplies. Miscellaneous tubes, 813s, 830s, 852, 204, relays, condensers, hundreds of parts. Cannot ship. Come see it, Make offer and take it away. Mrs. Esther Higson, P. O. Box 136, Clinton, Conn.

HAMS! Hook-up wire below wholesale 18-20 ga. Sample, Gay, Box 8024, Long Beach, Calif.

MODERNIZE Now! Highest trade-in allowance ever offered! Top notch used equipment. Lowest wholesale prices anywhere. Write right now about any gear you want, new or used. Marshall Electronics, 855 Burlington, Frankfurt, Ind.

MUST Sell HT-20, in new condx; save \$125.00; beautiful band-switching rig; hea y duty components, double shielding, blower, TVI-suppressed; continuous coverage 160 through 10, harmonics 90 db. down; cw. input 175 watts, phone 150, built-in low pass; \$325. Walter Keith, 601 East Fourth St. South, Newton, Iowa.

SELL: 2 Kw Superior powerstat; variable 0-135 VAC, 15 amps; Triplet 0-150 VAC meter, 3" included; \$24.95. Want to buy reasonable priced SX-16 or 17, RME-69 or 70, HQ120X, Kirkman, W0ZJH, 2444 Dec, Lincoln, Nebr.

FOR Sale: Elmac A54 transmitter, \$75; PMR6A receiver, \$90; TBS-6V power supply, \$15; 425 V 375 Ma. dynamotor 6V inp. \$9.00. F.o.b. Chicago. W9BYX, 205 Evergreen, Elmhurst, Ill.

SELL: Trio TV rotator with indicator and 20 ft. of control cable, \$15.00. Wagoner, K2CZY, 1105 Emerson Ave., West Englewood, N. J.

FOR Sale: BC610E, BC614E, 2 JB70 control units, complete with tubes, cables, tuning units, coils, and manual. All transformers hermetically sealed except modulation. Excellent: \$475.00; RME HF 10-20, new, \$50.00; Super Pro BC794B A-1, \$150.00. W4CDM, 634 29th St., So. Arlington, Va.

MARINE Crystals, new, guaranteed, heavy-duty types. Fast service, all frequencies. Specify frequency and socket pin dimensions. Transmitting, \$2.95; receiving, \$2.50. C-W Crystals, Box 2065, El Monte, Calif.

WANTED: BC-610, BC-614, BC-939, ART-13, DV-12, ARC-1, ARC-3, APR-4, ARN-7, TN-19, TN-54, BC-348, BC-442, TDO, BC-221, LM, APN-9, Teletype, keyers, 32V, 75A, test equipment, parts, tech manuals, cash or trade. New Johnson Viking, Ranger, B&W, Hallcrafters, Hammarlund, National, Central, Gonset, Elmac, Morrow, RME, Telrex, Fisher Hi-Fi, Pentron, Bell, etc. Write: Altronics, Tom, W1AFN, Box 19, Boston 1, Mass. Boston Tel. Richmond 2-0048. (Stores: 44 Canal, Boston; 60 Spring, Newport, R. I.)

SELL: NC-183D, with spkr, in new condx: \$250 or better. Cash. Box 96, R.F.D. #3, Freehold, N. J.

WANTED: Communication receiver in gud or repairable condx. State lowest price and condx. M. J. Marshall, 455 Washington Ave., Dumont, N. J.

SORRY fellas, my ad ran a month ahead of time, in July QST, due to misunderstanding. QTH uncertain at that time. Apologize for any inconvenience. Am now repeating it, ready for queries: Trade: Arc-3, C-4, 35 mm camera, 28 lens, flash gun, leather carrying case; all new, in original carton and Heathkit, \$20R rcvr in gud condx for Hammarlund HQ-129X, in A-1 condx. K4BGG, Joe S. White, 5892 Lemon Ave., Long Beach, Calif.

WANTED: Complete used mobile rig in gud condx, or used Gonset Communicator, contact Ronnie Gann, c/o ARRL, 38 LaSalle Rd., West Hartford 7, Conn.

GLOBE Scout in excellent condx, \$70.00; VFO, all bands, with power supply, \$10.00. William Waters, W8KWG, 539 Henley, Birmingham, Mich.

NEED ARC/3s. S. Gabriel, 4908 Hampden Lane, Washington 14, D. C.

1 Lysco 600 transmitter with separate modulator, complete 35 watt all band phone, wv xmitter, ready to go, 1 year old, \$125.00; Single side band BC-458 converted, ready to go, just plug in to a 20A or 10A, \$20.00; 458 new condition, not converted, \$15.00. W8THJ, Ken Deal, 104 E. Greene St., Piqua, Ohio.

WILL trade toward Collins 32V3 or other good xmitter, new 3/4 tone air conditioner with thermostat and assembled new Heath VTVM-V7 with probes 336-309C, oscilloscope OL-1 with probes 342-337C; V 0-100 Ma. output including 6 V storage battery, Vibrapack, signal generator SG-8, Electronic switch S-2, bar generator BG-1; also McMurdo Silver res. cap. bridge, model 904 and gud psychrometer. Want Elmac all band mobile receiver 6 volt, Trade Meissner signal shifter plus cash. Peck, W2OIF, 143 State, Auburn, N. Y. Tel. 3-3531.

FOR Sale: 32V2 transmitter and SP-400X rcvtr. Both sets in "like new" condx. \$425 for Tx and \$200 for Rx separately or will take \$600 for both. W5R1K, 5545 Preston Haven Dr., Dallas 30, Texas.

FOR Sale: Collins 32V2, perfect condition. First \$425 takes it. W4FLS, 220 No. Howell, Chattanooga, Tenn.

WANTED: Hallcrafters SR-75 transceiver in gud condx. E. Harvey Cunningham, W5CU, P. O. Drawer H, Rio Grande City, Texas.

HAMMARLUND HQ129X in perfect shape, very clean: \$140.00; Hallcrafters Skyriver 23, 200 watts, \$200.00. Will ship anywhere collect. W. Wehe, W6VZB, 16080 Cambrian Dr., San Leandro, Calif.

SELL: Dumont 241 scope, \$175.00; Teletype equipment, Klein-schmidt full keyboard perforator for Morse code, Collins 32V2, Wandt: BC-610, BC-614, BC-939, ARN-7, ART-13, Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Richmond 2-0916.

PORTABLE power supply packs, perfect for field operation, 200 watts, 100 Ma. output including 6 V storage battery, Vibrapack, recharger in portable case: \$30.00. Literature available. Industrial Television, Inc., 359 Lexington Ave., Clifton, N. J.

SELL: 250 W. 813 bandswitch phone xmitter with pwr supplies and VFO: \$175.00. WIPCO, Andrews, 208 Valley Rd., Needham, Mass.

FOR Sale: Heathkit AT-1 xmitter, VF-1 VFO, AC-1 antenna coupler, on air only 3 hours: \$50.00 takes all. W2FNL, 56 Grand St., Garfield, N. J.

# Designed for



# Application



## The No. 90651 GRID DIP METER

The No. 90651 MILLEN GRID DIP METER is compact and completely self contained. The AC power supply is of the "transformer" type. The drum dial has seven calibrated uniform length scales from 1.5 MC to 300 MC plus an arbitrary scale for use with the 4 additional inductors available to extend the range to 220 kc. Internal terminal strip permits battery operation for antenna measurement.

## JAMES MILLEN MFG. CO., INC.

MAIN OFFICE AND FACTORY  
**MALDEN**  
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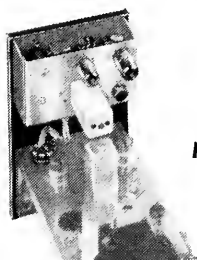
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# NEW MULTIPHASE "Q" MULTIPLIER

- Peaks Desired Fone or CW Signal
- Nulls Out Interfering Carrier up to 50 DB.
- No Loss in Speech Intelligibility

- No Insertion Loss — New Two Tube Circuit
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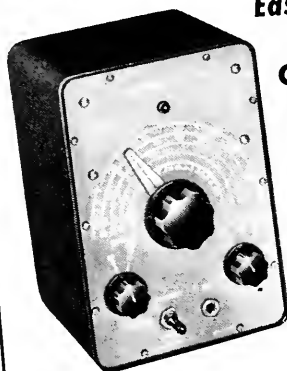
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Here's why RCA high-perveance beam power tubes, like the 6146, are preferred by leading designers of amateur and commercial transmitters.

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RCA High-Perveance Beam Power Tubes are available at your RCA Tube Distributor—for amateur transmitters having input-power ratings up to a "gallon." For technical data on any specific beam power tube type including the 6146, write RCA, Commercial Engineering, Section H37M, Harrison, N. J.



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90 watts ICAS input on CW; 67.5  
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Reduced input up to 175 Mc.



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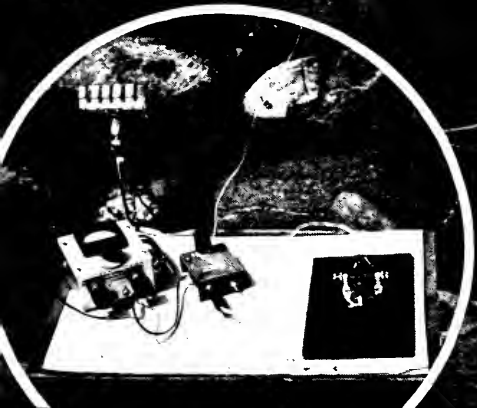
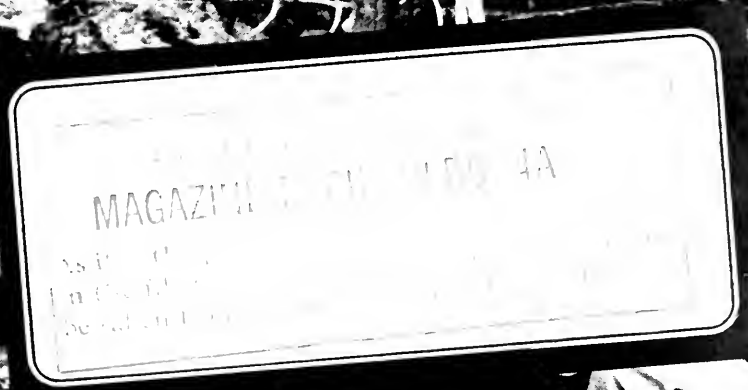
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In This Issue! — AMATEUR COMMUNICATION BY SOLAR POWER

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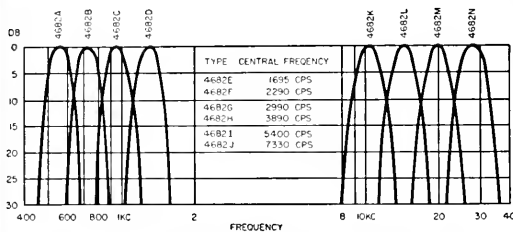
# FILTERS

## FOR EVERY APPLICATION

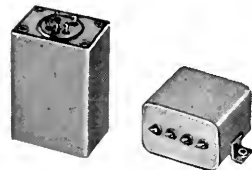


### TELEMETERING FILTERS

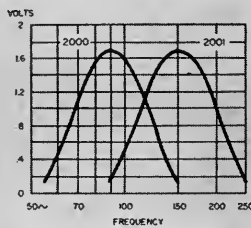
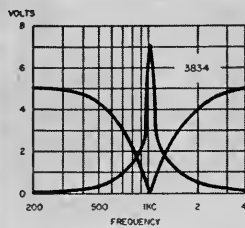
UTC manufactures a wide variety of band pass filters for multi-channel telemetering. Illustrated are a group of filters supplied for 400 cycle to 40 KC service. Miniaturized units have been made for many applications. For example a group of 4 cubic inch units which provide 50 channels between 4 KC and 100 KC.



Dimensions:  
(4682A) 1½ x 2 x 4".



Dimensions:  
(3834) 1¼ x 1¾ x 2-3/16".  
(2000, 1) 1¼ x 1¾ x 1¾".



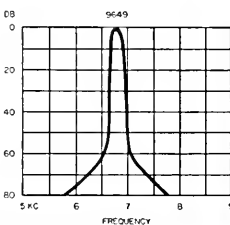
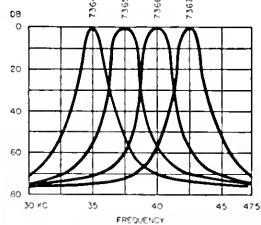
### AIRCRAFT FILTERS

UTC has produced the bulk of filter used in aircraft equipment for over a decade. The curve at the left is that of a miniaturized (1020 cycle) range filter providing high attenuation between voice and range frequencies.

Curves at the right are that of our miniaturized 90 and 150 cycle filter for glide path systems.

### CARRIER FILTERS

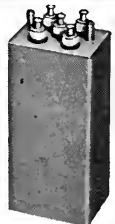
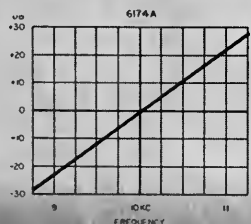
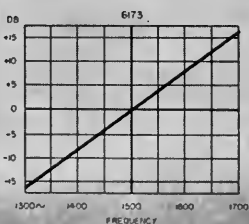
A wide variety of carrier filters are available for specific applications. This type of tone channel filter can be supplied in a varied range of band widths and attenuations. The curves shown are typical units.



Dimensions:  
(7364 series) 1½ x 1½ x 2¼".  
(9648) 1½ x 2 x 4".

### DISCRIMINATORS

These high Q discriminators provide exceptional amplification and linearity. Typical characteristics available are illustrated by the low and higher frequency curves shown.



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(6173) 1-1/16 x 1½ x 3".  
(6174A) 1 x 1¼ x 2¼".

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**LAST YEAR'S WINNER.** Benjamin S. Hamilton, W6VFT, is congratulated by Val Peterson, right, Administrator, Federal Civil Defense Administration. J. Milton Lang, general manager of the G-E Tube Department, looks on.



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The Fourth Annual Edison Radio Amateur Award will give you an opportunity to recommend for high honors an amateur who has rendered important public service.

Handsome trophy, a \$500 check, and coast-to-coast recognition await the 1955 winner. The panel of judges will consider only candidates nominated by letters from you and others.

Start now to make your selection and assemble the facts for your nominating letter. Read the Award Rules at right!

Radio amateurs and their friends are generous in acclaiming accomplishment. No better means for this exists than for you to name . . . soon . . . a candidate for the Edison Award.

Send your letter to *Edison Award Committee, General Electric Company, Tube Department, Schenectady 5, N. Y.*

## RULES OF THE AWARD

**WHO IS ELIGIBLE.** Any man or woman holding a radio amateur's license issued by the F.C.C., Washington, D.C., who in 1955 performed a meritorious public service in behalf of an individual or group. The service must have been performed while the candidate was pursuing his hobby as an amateur within the continental limits of the United States.

**WINNER OF THE AWARD** will receive the Edison trophy in a public ceremony in a centrally located metropolitan city. Expenses of his trip to that city will be paid.

**\$500 GIFT.** Winner will be presented with a check for this amount in recognition of the public service he has rendered.

**WHO CAN NOMINATE.** Any individual, club, or association familiar with the service performed.

**HOW TO NOMINATE.** Include in a letter the candidate's name, address, call letters, and a full description of the service performed. Your letter must be postmarked not later than January 2, 1956.

**BASIS FOR JUDGING.** All entries will be reviewed by a group of distinguished and impartial judges. Their decisions will be based on (1) the greatest benefit to an individual or group, (2) the amount of ingenuity and sacrifice displayed in performing the service. The judges will be:

**E. ROLAND HARRIMAN**, President, The American Red Cross.

**HERBERT HOOVER, JR.**, The Under Secretary, U. S. Department of State.

**EDWARD M. WEBSTER**, Commissioner, Federal Communications Commission.

**GOODWIN L. DOSLAND**, President, American Radio Relay League.

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Employees of the General Electric Company may nominate candidates for the Edison Radio Amateur Award, but are not permitted to receive the Award.

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# QST

SEPTEMBER 1955

VOLUME XXXIX • NUMBER 9

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Louisiana	W5FMO	Thomas J. Morgavi	3409 Beaulieu St.
Mississippi	W5WZY	Julian G. Blakely	104 N. Poplar St.
Tennessee	W4SCF	Harry C. Simpson	1863 So. Wellington St.
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Michigan	W3RAE	Thomas G. Mitchell	409 Liberty
Ohio	W3AJW	John E. Siringier	2972 Clague Rd.
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N. Y. C. & Long Island	W2IUK	Harry J. Dannels	139 East Zoranne Drive
Northern New Jersey	W2VQR	Lloyd H. Manamon	709 Seventh Ave.
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Santa Barbara	W6QIW	William B. Farwell	90 Grapevine Road
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Oklahoma	W5RST	Dr. Will G. Crandall	State Veterans Hospital
Southern Texas	W5QDX	Morley Bartholomew	RFD 7, Box 65
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Ontario	VE3IA	G. Eric Farquhar	16 Emerald Crescent
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Alberta	VE6MJ	Sydney T. Jones	10706-57th Ave.
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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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# "It Seems to Us..."



## HELPING NEWCOMERS

Here it is September again — our vacations are over, the ol' swimmin' hole has lost some of its grip on us, the summer QRN has started to fade away. Our thoughts turn once again to active hamming; the local club gets going again in full swing. It seems time for a reminder of a couple of related worth-while projects for the local gang to tackle.

Hams have long held out a helping hand to newcomers on an individual basis. In the past few years, more and more radio clubs have been offering formal courses in amateur radio for beginners, with club members sharing the teaching tasks. Prospective hams have been attracted to the courses by notices in the papers, in schools, and at Scout and civic club meetings. Now is a good time for your club to start laying plans for this year's course. If help is needed, the Communications Department of ARRL offers assistance in the form of code-practice schedules, course outlines, and training aids. Whether or not you ask for aid, however, the Communications Department would like to know about your course so that other newcomers in your area can be steered your way.

A closely-related project is the setting up of a committee to conduct examinations for Novice, Technician and Conditional Class aspirants. As earlier editorials pointed out, it is important that these "mail" examinations be conducted with uniform standards, to ensure that only qualified people obtain licenses, and to ensure that all applicants have equal opportunity. The objective can best be accomplished by appointing mature, qualified amateurs to serve on examination committees in every club throughout the country. This system has an advantage over the use of individual, uncoordinated examiners, however qualified they may be personally, in that prospective amateurs can be notified through the press, radio and other media mentioned above of the time and place of the tests.

FCC has expressed (*QST*, September, 1954, page 9) the hope that all clubs will establish such committees. The District Engineers are anxious to know when these groups go into operation and are always ready to assist in getting them started. It may be possible for committees to keep a supply of application

blanks and test papers on hand, speeding the licensing process considerably for anxious applicants.

Every activity needs new blood, and these two projects will help to assure the continuing flow of eager newcomers into amateur radio. Here's your chance to train new operators the way they should be trained, and build up the club at the same time.

## WHICH CALL TO SIGN?

As we hams are a thoroughly fraternal bunch, it is hardly news that many new licensees quickly take up the pleasant custom of station-visiting. But our correspondence recently indicates a misunderstanding on one aspect — what call does W1AAA sign when he is visiting W1BBB?

There's only one answer. When operating another ham's station, you sign his station call, not your own personal station's call. You can indicate in the course of conversation that your own station is W1AAA, but that's pure conversation and not part of the signing procedure. The call you sign for the station's operation is W1BBB. And of course the data goes into the station's log, not your own back home.

We should perhaps remind you that a station may be operated only within the privileges available to both operator and station license. For example, Novice WN1AAA can visit General Class W1BBB and operate the latter station, but only in the Novice bands, using crystal-control, and 75 watts or less input. The call to be signed is W1BBB. The General Class operator can pay a return visit and operate WN1AAA, of course signing that call, but again only under Novice privileges. It would not be proper for the General Class operator to operate the Novice-licensed station by signing his personal station call in other than Novice bands. Nor can he use VFO or more than 75 watts input at the Novice station on the theory that he is licensed for such operation; surely he is, but the Novice's station isn't.

Keep up the visiting, OMs, but remember that you sign the call of the station being visited, and are limited by the scope of its station license and your operator license, whichever privileges are the lesser.

## A.R.R.L. CONVENTIONS

### SOUTH DAKOTA STATE CONVENTION

*Yankton, So. Dak. — September 3rd and 4th*

The Prairie Dog Amateur Radio Club is sponsoring, and will be host to, the 1955 ARRL South Dakota State Convention to be held in Yankton, So. Dak., September 3rd-4th. It will be held in the Msgr. Link Memorial Auditorium and banquet hall adjoining. Program starts at 1:00 P.M. CST Saturday, Sept. 3rd. Registration begins at 9:00 A.M., continues in afternoon as needed.

The program will include ARRL section net meetings, technical meetings, Novice c.w. QSO contest, informal mixer, musical code contest, "war whoop" breakfast, mobile judging, hidden-transmitter hunt on 75 meters, tours of state hospital and/or Gavans Point dam construction, and banquet with "family-style" meal, at which the Governor of So. Dak. is scheduled to speak.

Ample playground and parking facilities available. Golfing, etc., available for those not participating in convention activities.

Registration, including 1 banquet ticket, \$5.00; additional banquet tickets, \$2.25. Send advance registrations to Neal Edwards, 201 Locust St., Yankton, South Dakota.

### SOUTHWESTERN DIVISION CONVENTION

*San Diego, Calif. — October 1st and 2nd*

The San Diego Council of Amateur Radio Organizations in sponsoring the 1955 ARRL Southwestern Division Convention to be held in San Diego, Calif., on October 1st and 2nd. It will be held in the famous exposition facilities of Balboa Park, commencing with registration at 9:00 A.M. Saturday, October 1st. Preconvention activities will be held at the Manor Hotel during Friday evening, September 30th.

The program will include mobile contests, transmitter hunts, miscellaneous contests, exhibits, ROWH ceremony, ARRL open forum, technical talks, v.h.f. round-up, YLRL activities, DX activities and a host of other events.

The banquet, entertainment and dance will be held on Saturday evening. Registration (including banquet, dance, etc.) is \$6.50 per person. For advance registration and information, write J. Roy Smith, W6WYA, General Chairman, 2052 Venice St., San Diego 7, Calif.

## HAMFEST CALENDAR

**CONNECTICUT** — The Laurel Amateur Radio Assn. is sponsoring the first annual Conn. Hamfest Picnic on September 18th, all day, at MacLean's Grove, Granby, Conn. Admission one dollar for the entire family. Several contests for OMs and XYLs; also awards for best mobile installation. Bring your own food and drink. Guest speakers and other entertainment.

**KENTUCKY** — The Second Annual Lexington Hamfest will be held on Sunday, September 25th, at the Lexington Water Company's Reservoir (same place as last year) on U. S. 25, east, about 2 miles from Lexington. There will be a hidden-transmitter hunt and other activities for young and old. Box lunches will be available on advance notice and remittance of \$1.25 per lunch for either fish or chicken. All remittances for lunches and tickets should be sent to Dr. H. L. Echols, 2000 Nicholasville Rd., Lexington, Ky., on or before Sept. 23rd.

**LOUISIANA** — The Greater New Orleans Amateur Radio Club announces the second annual "Week End in Old New Orleans," Labor Day week end. Dance on Saturday, September 3rd, and ham picnic on Sunday, September 4th. Special events and contests for the ladies and children. Admission to dance, \$2.50; admission fee to picnic, \$1. Come and enjoy Labor Day in old New Orleans. Write "Week End in Old New Orleans," P. O. Box 13003, New Orleans, La.

**NEW YORK** — Saturday, September 24th, at the Masonic Temple Dining Room, 230 Main St., Oneida, N. Y., 11th Annual Hamfest and Ladies Night of the Oneida Area

## COMING A.R.R.L. CONVENTIONS

**September 3rd-4th — South Dakota State, Yankton, S. D.**

**September 30th-October 1st-2nd — Southwestern Division Convention, San Diego, Calif.**

**October 15th-16th — Central Division, South Bend, Ind.**

**October 22nd-23rd — Midwest Division, Omaha, Neb.**

radio amateurs. Admittance at \$3.00 per person is by advance registration only and is limited to 150 persons, the capacity of the dining room. Registration will start at 5:00 P.M., banquet at 7:00 P.M. Make all reservations before September 22nd with Walter L. Babcock, W2RXW, 405 Sayles St., Oneida, N. Y.

**OHIO** — 18th Annual Stag Hamfest, Sunday, September 11th. Biggest bargain hamfest in U. S. A.; over 800 actual amateurs attended last year. Sponsored by the Greater Cincinnati Amateur Radio Association. The location is Kopleng Grove on Winton Road two miles south of Greenhills, Ohio. Registration \$2.50 at the gate — here's what you get: hot dogs all day long, donuts and coffee served till noon, beer and pop served all day, full picnic dinner and supper (all you can eat), rain or shine. Lots of games, radio-controlled model airplane show, etc. For additional information, contact Elmer Schubert, W8ALW, 3965 Hammar Court, Cincinnati 11, Ohio.

## OUR COVER

E. Laird Campbell, W1CUT, shown operating the first solar powered station. The transmitter consists of a 2N76 transistor, while the receiver is the "Little Gem" field-strength meter. For further details see page 11.

## Strays

W7GND has come up with an easier way of modifying the 1625 tetrodes used in the "200-Watt Linear amplifier," June QST.

He found that the cathode and suppressor leads are brought out to the tube pin in the National Union type 1625. By drilling a  $\frac{3}{8}$  inch hole in the side of the tube above the cathode pin and one over an unused pin, the suppressor wire can be unsoldered from the cathode and connected to the unused pin.

In order to determine which lead is the cathode and which is the suppressor, the filament is lighted and the electron flow from each of the unknown wires to the plate is measured. The combination with the larger current determines the cathode lead, while the other is the suppressor.

## ARE YOU LICENSED?

• When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.

# Solarized QSO

## Amateur Communication Using Solar Power

BY E. LAIRD CAMPBELL, WICUT

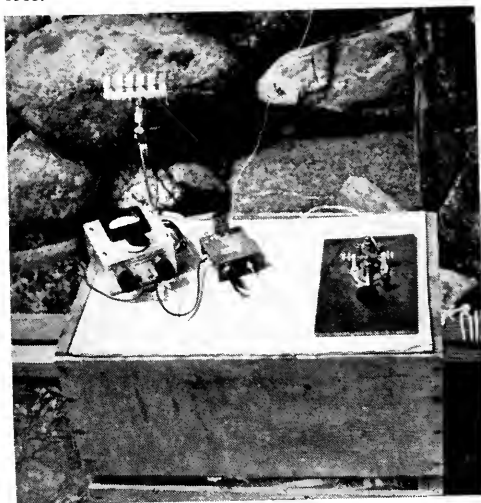
• Here is something to whet the imagination of the Buck Rogers and Dick Tracy sets: radio communication with the necessary electrical power derived directly from sunlight. We hesitate to predict an immediate switch by everyone to solar power only, but it isn't difficult to visualize a future of ultra-compact stations dependent upon the cloud conditions or even the phase of the moon ("moon power") for their S-meter readings. Imagine calling a rare piece of DX just as the sun goes behind a cloud, and the frantic scrambling for matches and burning material to keep the call going!

"Q RX ol' man, cloud approaching." These words were not unusual at North Granby, Conn., during the 1955 ARRL Field Day activities. Concern over the weather was quite reasonable considering that perhaps the first solar-powered amateur station was in operation. Both the transmitter and receiver incorporated transistors and were powered completely by energy from the sun.

### Power Supply

Power for the transmitter and receiver was obtained from six self-generating selenium photo-electric cells. These were the International Rec-

<sup>1</sup>Campbell, "Transistorized 'Little Gem'", *QST*, Aug., 1955.



Solar-powered amateur station. The solar battery can be seen clamped to the top left of the operating table. The transistor transmitter is in the center with the receiver to the left.

tifier type B2M, and had an output of 0.5 volts at 2 ma. each. The six cells were connected in series and mounted on a piece of lucite. This was then bolted to a bracket on a ball and socket clamp to aid in orienting the battery toward the sun. Under a load of 0.5 ma. the battery produced about 2.8 volts in direct sunlight and would drop to below 2 volts in diffused sunlight.

### Transmitter

A transistor in a crystal-controlled oscillator circuit was used for a transmitter. As can be seen

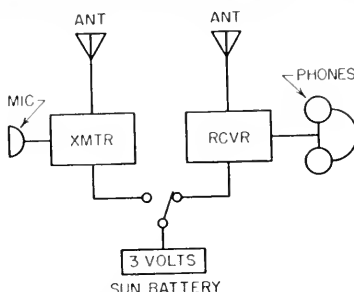


Fig. 1 — A block diagram of the solar-powered station.

in Fig. 2, a minimum of components is required. The transistor is a General Electric type 2N76 and it oscillated easily at 1800 kc. By placing a carbon microphone or a key in series with the power supply, the transmitter could be operated

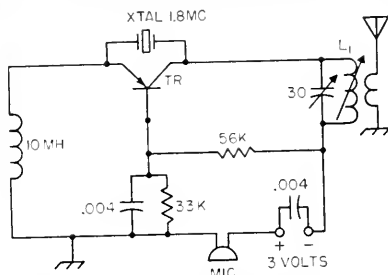


Fig. 2 — Transistor transmitter. Tank inductance  $L_1$  is a Vari-Loopstick with a link coil wound around the outside of the coil form.

on 'phone or c.w. A random length wire served as an antenna with good results.

### Receiver

The receiver used was a Transistorized "Little Gem" <sup>1</sup> in the field-strength meter position. The effective circuit can be seen in Fig. 3. The tuned signal is rectified by the crystal diode detector and amplified by the transistor (Hydro-Aire

(Continued on page 110)

# The "2B3" Superheterodyne

*A Simple "Minimum" Receiver for 80 and 40 Meters*

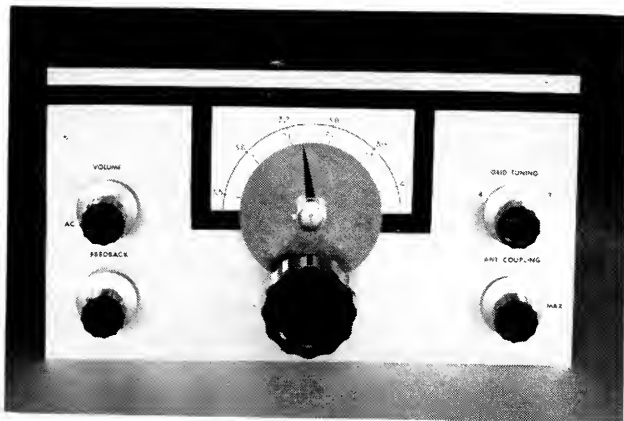
BY BYRON GOODMAN, WIDX

**T**HE title of this article has no more justification than that it identifies a particular design and, if you know the code we just invented, it signifies a "2-band 3-tube" superheterodyne. It is the dull end result of looking around for a title to describe a little superheterodyne that will serve anyone quite well as his first ham-station receiver.

This receiver started out as an attempt to build a practical two-band receiver that would more than hold its own with anything selling for thirty dollars. No attempt was made to make it an "all-band" affair—we figured we were licked from the start in that department. But by confining the tuning range to two amateur bands, we knew it would be possible to build in operating features, such as adequate bandspread and

• The receiver described on these pages is called a "minimum" receiver by the author because, in his opinion, it represents the minimum in receiving equipment that will give a good account of itself under present band conditions. The simple construction makes it an easy matter to duplicate the receiver.

lating) state, hoping that the resultant selectivity would be sufficient for adequate single-signal c.w. reception. It wasn't, and it was also observed that the 6U8 pentode section used as the regenerative detector was a little more microphonic than we care to have such things, so a 6BD6



This two-band superheterodyne receiver uses an autodyne second detector and adjustable antenna coupling. The dial pointer and black trim strips are made of black Scotch Tape. The control marked "Feed-back" is the regeneration control.

good stability, that are quite hard to come by in an inexpensive all-band commercial job. We started out with three dual triodes: one as a mixer-oscillator, one as a detector-b.f.o., and the third as a two-stage audio amplifier. Investigating selenium-rectifier *vs.* tube-rectifier power supplies, it was found that the latter was cheaper. The dual triodes were 6SN7s, because the sockets for these tubes are cheaper than those for the miniature tubes. But the performance of the finished product didn't come up to our expectations—the triode mixer was touchy and the detector-b.f.o. combination didn't behave as had been hoped. The original objective of absolute rock-bottom cost was scrapped, and we turned to the use of miniature tubes. Here a logical choice for mixer-oscillator and detector-b.f.o. seemed to be the 6U8 triode-pentode. A homemade 1700-kc. i.f. transformer was substituted for the commercial unit previously used, but again we weren't satisfied with the detector. We were using it in a regenerative (but nonoscil-

lating) state, hoping that the resultant selectivity would be sufficient for adequate single-signal c.w. reception. It wasn't, and it was also observed that the 6U8 pentode section used as the regenerative detector was a little more microphonic than we care to have such things, so a 6BD6

## The Circuit

While few will argue about the sensitivity of an autodyne detector, anyone who has worked with one knows that the loading is critical, and an antenna swinging in the breeze may "pull" the frequency. Then, too, the regeneration control setting may need changing as one tunes a band. Using an autodyne detector at a low fixed frequency obviates these shortcomings but dictates a superheterodyne type of receiver. By

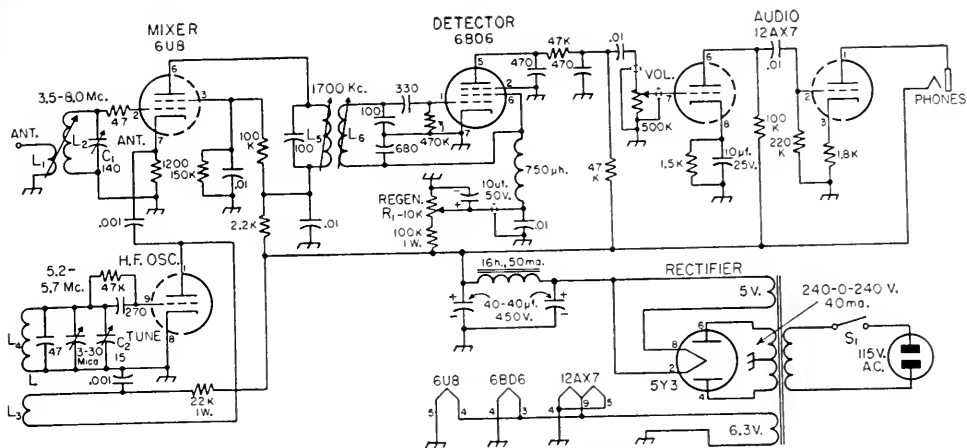


Fig. 1 — Schematic diagram of the two-band superheterodyne.

- C<sub>1</sub> — 140-μf. midget variable (Hammarlund HF-140).  
 C<sub>2</sub> — 15-μf. midget variable (Hammarlund HF-15).  
 R<sub>1</sub> — 10,000-ohm 2-watt wire-wound potentiometer (Clarostat A43-10K).  
 L<sub>1</sub>, L<sub>2</sub>, L<sub>3</sub>, L<sub>4</sub> — B & W No. 3016 Miniductor, 1-inch diam., 32 turns per inch, No. 22 wire.  
 L<sub>1</sub> — 12 turns.  
 L<sub>2</sub> — 26 turns.  
 L<sub>3</sub> — 8 turns.  
 L<sub>4</sub> — 21 turns, separated from L<sub>3</sub> by one (removed) turn.

Adjacent turns on L<sub>3</sub> and L<sub>4</sub> go to 0.001 μf. and chassis respectively.

L<sub>5</sub>, L<sub>6</sub> — Grayburne Vari-Loopstick. (80 μh., approx.)

S<sub>1</sub> — Mounted on 500K volume control.

All resistors 1/2-watt unless specified otherwise. All capacitances in μf. unless otherwise noted. All fixed capacitors except two across L<sub>6</sub>, one across L<sub>4</sub>, and the electrolytics (polarity marked) are ceramic. Fixed capacitors across L<sub>4</sub> and L<sub>6</sub> are silver mica.

Power transformer is Knight (Allied Radio) 62-G-034, filter choke is Knight 62-G-137, filter capacitor is Mallory 2N-537.

limiting the frequency range of the receiver to two consecutive amateur bands and using an i.f. of half the frequency difference between the two bands, it is possible to "change bands" simply by tuning the input circuit to the one band or the other. For example, with the high-frequency oscillator tuned to 5.3 Mc., and the i.f. at 1700 kc., the receiver responds to either a 3.6-Mc. signal (5.3 — 3.6 = 1.7) or a 7.0-Mc. signal (7.0 — 5.3 = 1.7), depending upon the tuning of the mixer grid circuit. It is a convenient arrangement that permits building a bandspread two-band receiver with no bandswitching. To listen on higher frequencies, a crystal-controlled

converter can be used ahead of the set, working into it at 80 meters.

Referring to the circuit in Fig. 1, it can be seen that adjustable input coupling is provided (variable coupling between L<sub>4</sub> and L<sub>2</sub>). While the signal level can be reduced by detuning the 140-μf. ANT capacitor, C<sub>1</sub>, the adjustable coupling is easy to construct and permits reducing the input level without detuning. The high-frequency oscillator output is coupled to the cathode of the pentode mixer, to provide a low-noise mixer and a minimum of "pulling." Changing the setting of the ANT capacitor does not pull the oscillator frequency appreciably unless the

The miniature tubes, from left to right, are 6U8, 6BD6 (in shield) and 12AX7. The left-band variable capacitor tunes the mixer input circuit, and the small one in the center tunes the high-frequency oscillator. Note the phono-jack antenna terminal and headphone output jack on the wall of the chassis. The tuning capacitor at rear center is mounted on an aluminum bracket.



mixer input circuit is tuned close to the oscillator frequency, a condition that is never used.

The 1700-kc. i.f. transformer ( $L_5$  and  $L_6$  and the associated shunt capacitors) uses two of the compact ferrite-cored b.c. antenna coils that have become popular recently. They have the twin virtues of low cost and quite adequate  $Q$  for this job. The regenerative detector uses the Colpitts circuit to eliminate the need for tapping the coil or adding a tickler winding. An electrolytic capacitor across the regeneration control eliminates the noise produced by varying the wire-wound potentiometer. This potentiometer was selected instead of a composition affair because of a personal preference for such controls wherever any significant current is involved.

The two-stage audio amplifier is conventional, except that we started out with no cathode bypass capacitors and found that the one shown on the first stage reduced some a.c. hum. The a.e. switch,  $S_1$ , is mounted on the audio volume control.

### Construction

An  $8 \times 12 \times 3$ -inch aluminum chassis plus a  $7 \times 13$ -inch panel provides enough metal for the receiver, with the single exception of the scrap of aluminum needed for the bracket that supports the 15- $\mu$ f. tuning capacitor,  $C_2$ . The panel is held to the chassis by the two shaft bearings and the regeneration-control potentiometer, as can be seen in one of the photographs. It will pay off to take a little care in the location of the holes for the National type K dial, in the interests of a smooth-tuning receiver. We built the tuning-capacitor bracket first, lined up the capacitor shaft against the panel to mark the dial bushing hole, and then used the template that comes with the dial to locate the drive bushing hole. The small knob that comes with the Type K dial was replaced by a large one, and a couple of drops of oil were used to lubricate the drive bushing.

Practically everything else in the receiver can be located from the photographs, but we will touch on one or two points. The adjustable antenna-coupling coil was mounted on the end of a length of  $\frac{1}{4}$ -inch diameter lucite rod by cutting the end of the rod at 45 degrees and cementing a small scrap of polystyrene sheet to this face. The scrap was then filed to fit inside the coil and secured with a few drops of Duco cement. Four small holes are drilled through the rod: two for the coil ends (which also serve as tie points for the flexible antenna and ground leads), one through which the antenna and ground leads are threaded and cemented, and the fourth through which a piece of No. 20 wire is pushed and bent back around the rod. This last wire serves as a shoulder that bears against a fiber (or metal) washer that in turn bears against a large rubber grommet with a  $\frac{1}{4}$ -inch hole, as shown in Fig. 2. The other side of the grommet has another washer between it and the panel bushing. The rod is pushed through the bushing, two more washers are added, and then the knob is put on. By pushing the rod out

through the panel as the knob is tightened, the rubber grommet is left in compression, and it serves as a simple friction lock for the control. It almost takes longer to describe the gadget than it does to build it.

The two coils  $L_5$  and  $L_6$  are mounted on 1-inch separated centers. The "phones" jack is insulated from the chassis by fiber washers. Both  $C_2$  and  $C_1$  capacitors are insulated from the chassis — the former by mounting it with short bushings on the mounting bracket, and the latter

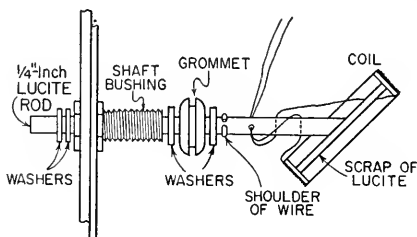


Fig. 2 — Details of the adjustable antenna coupling coil. Part of the coil has been cut away to show the support.

by fastening it to the chassis with a machine screw through small extruded fiber washers. Clearance holes for leads from both stators and rotors of these capacitors were provided, as can be seen in the photographs. For those who question the author's sanity in going to this trouble to provide for rotor leads that could be made by simply anchoring the rotors to the chassis, we hasten to point out that one of our pet tricks is to provide short and single r.f. paths for circuits that are sometimes left to chance. In several instances it has apparently added considerably to the stability of oscillators, and we now do it as a matter of course.

The only other touch someone might argue with is the shielded leads to and from the volume control. These pass through a grommet in the chassis and make connection to the chassis only at the 12AX7 socket. This is a precaution that reduces hum in some cases where there are heavy a.c. chassis currents. The lead from the arm of the regeneration control was shielded also, in an effort to confine the 1700-kc. energy to the vicinity of the detector.

### Alignment

Assuming that the wiring is correct, that the tube heaters light when you turn on the set, and that the power supply delivers 250 to 300 volts, the first step is to check the detector. This is conveniently done with the 6U8 out of its socket — then if something is wrong in the "front end" it won't confuse the detector checking. With headphones plugged in and the receiver (less 6U8) warmed up, advancing the volume control should give a hissing sound in the headphones. Advancing the regeneration control (increasing the voltage on the 6BD6 screen) you should find a point where the hiss increases appreciably and perhaps a very slight hum is

heard. This is the point where the detector "oscillates" — below this point you won't get a beat note with c.w. signals, and beyond it you will. The detector works — the next step is to get it on 1700 kc. (If it doesn't work, check your wiring and the voltages at the 6BD6 and 12AX7 pins.) If you can beg, borrow or steal a test generator, it is a cinch to put the detector on 1700 kc. by adjusting the slug in  $L_6$  until the 1700-kc. signal is heard. The test signal need only be loosely coupled to  $L_6$  — a wire placed a foot from the coil and connected to the test generator should suffice. Lacking the test generator, you may be able to use a b.c. receiver by tuning it to around 1245 kc. If the receiver has a 455-kc. i.f., the oscillator will be close to 1700 kc., and if the b.c. receiver is placed within a few feet of the receiver under test, there will be enough radiation from the b.c. receiver to act as the test signal. Don't go by the calibration on the b.c. receiver; make a new one from known local stations.

When the autodyne detector is working satisfactorily and you have acquainted yourself a little with its operation, plug in the 6U8 and let it warm up. Trim  $L_5$  until you find a point where it pulls the detector out of oscillation, and detune it slightly until regeneration starts about 10 or 15 degrees farther along on the regeneration control,  $R_1$ , than it did when  $L_5$  was tuned well off the frequency. Check again to make sure that you are still on or close to 1700 kc.

Now connect an antenna (any wire 20 feet long or more) and swing the ANT capacitor,  $C_1$ , across its range. The receiver noise should increase at two points — one near minimum on the capacitor (40 meters) and one around  $\frac{3}{4}$  meshed (80 meters). The 3-30- $\mu\text{f}$ . compression oscillator trimmer should be set at about  $\frac{1}{2}$  turn back from its tightest setting. Leaving the ANT capacitor on 80 or 40 meters, tune around with the TUNE capacitor,  $C_2$ , until you locate some amateur signals. If you lack a frequency standard or the ability to borrow one, you have no alternative but to identify the bands by the limits of 'phone or c.w. signals in the various subbands. In any event, once you have found the signals, you can move the bands on the TUNE scale by changing the setting of the mica compression trimmer. However, unless the i.f. is *exactly* on

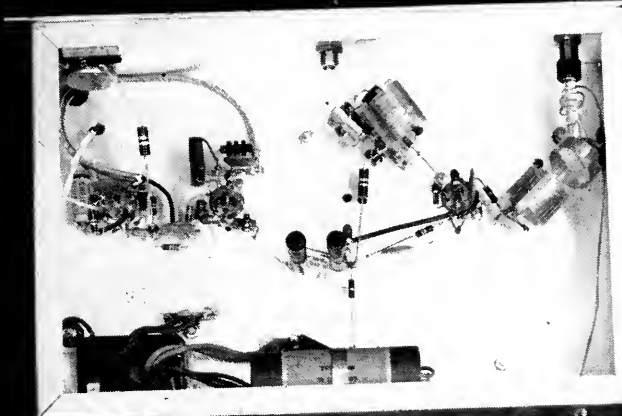
1700 kc., the 7.0- and 3.6-Mc. points, 7.1 and 3.7 Mc., etc., won't coincide as they do on the homemade scale shown in the photograph. Observing the error, however, you can bring the i.f. to 1700 kc. easily. Incidentally, the homemade scale is simply a sheet of white paper held down with black Scotch Tape, with a sliver of tape on the dial to serve as a pointer. The pointer laps over the "O" end, and the 0-100 scale of the dial can still be used for logging by referring it to the upper edge of the lower horizontal black strip on the right-hand side.

### Operation

For the reception of c.w. signals, the regeneration control is advanced far enough for the detector to oscillate, as indicated by the sudden increase in hiss. It may be noticed that on strong signals it is impossible to tune in a signal at a low beat note (200 to 300 cycles). This indicates that the signal is too strong and is "pulling" or "blocking" the detector. To overcome this, increase the regeneration control or reduce the antenna coupling. After you have used the receiver for a while, you will get used to the "feel" of it and you will find the settings that work best for various QRM levels.

When receiving a.m. 'phone, the regeneration control is maintained just below the oscillation point. It will soon be noticed that this is the most sensitive point for 'phone reception, since the gain of the detector decreases as you back off the regeneration control still more. The selectivity of the receiver for 'phone reception is not as great as can be expected from a small superheterodyne using several tuned circuits in a 455-kc. i.f. amplifier. However, you can make up a lot of this selectivity by decreasing the antenna coupling and running the detector just under the oscillation point. A strong signal decreases the selectivity of the regenerative detector, hence the need for reducing the signal by decreasing the antenna coupling. S.s.b. 'phone is received the same as a c.w. signal, by advancing the regeneration control past the oscillation point and tuning carefully about the signal until it becomes intelligible. Overload is again your enemy here, so run the antenna coupling at a value consistent with good signal/noise ratio.

The mixer input and high-frequency oscillator coils are mounted on tie points, as shown here. The antenna coil,  $L_1$ , is mounted on the end of a piece of lucite rod, as shown here and in Fig. 2. The leads to it are wrapped several times around the rod, to provide a "pig tail" connection.





# Upper-Air Conditions for Two-Meter DX

## Temperature and Water-Vapor Content Soundings for Some Famous Dates

BY JAMES S. COLLIER,\* W2QBB

THE v.h.f. man is well aware that a "temperature inversion," "steep water vapor gradient" or some such thing is necessary for tropospheric propagation of his signals over extraordinary distances.

W2BAV in his article, "Painless Prediction of Two-Meter Band Openings" (*QST*, October, 1949), pointed out the correlation between surface weather conditions and some good 2-meter openings. Similarly, this article will show the vertical distribution of temperature and moisture for times of good 2-meter DX.

Consider first the variation of temperature and water vapor with height as shown in Fig. 1. There are no temperature inversions (that is, an

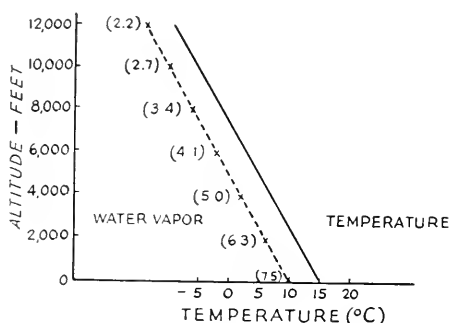


Fig. 1 — U. S. Standard Atmosphere temperature curve. The water-vapor curve is one that would result if the relative humidity were 70 per cent from the ground elevation to 12,000 feet. Figures in parentheses in this and following drawings are values of mixing ratio.

increase of temperature with height<sup>1</sup>), and no sharp changes in the water vapor curve — just a steady decrease with altitude from a maximum at the earth's surface.

If a radio wave is to remain near the earth's surface and not be lost to outer space, some downward refraction is necessary. There would be no v.h.f. DX with the average sounding of Fig. 1, but the refraction under such conditions is sufficient to extend the v.h.f. range somewhat beyond the line of sight. A condition known as *superrefraction* (that is, more than ordinary refraction) is needed for real tropospheric DX.

\* 57 Chapel Ave., Buffalo 25, N. Y.

<sup>1</sup> An inversion is sometimes considered to exist if the temperature lapse rate (decline in temperature with altitude) is less than 3 degrees Fahrenheit for 1000 feet of altitude. — Ed.

<sup>2</sup> H. G. Booker, *Compendium of Meteorology*, pages 1290 to 1295, published by the American Meteorological Society, Boston, Mass.

• Most v.h.f. operators develop weather consciousness before they have been in the game very long. They know that the daily weather maps can give indications of possible favorable propagation. Here W2QBB shows the actual upper-air conditions needed for 2-meter DX, and presents some soundings taken in areas where long-distance contacts were made.

Now that we have seen what won't produce 2-meter DX, let's look at a sounding that has a superrefracting layer in it. Fig. 2 is a plot of an actual upper-air sounding obtained at Joliet, Illinois, on September 6, 1950. The data were obtained from a radiosonde instrument released at 2200 EST. The moisture content of the air is shown by plotting the ratio: grams of water vapor per kilogram of dry air. This is called the *mixing ratio*. In this sounding and those to follow, the altitude scale shows the height above sea level of the significant points. Therefore, the first point on a curve is at the elevation above sea level of the station and not necessarily at zero

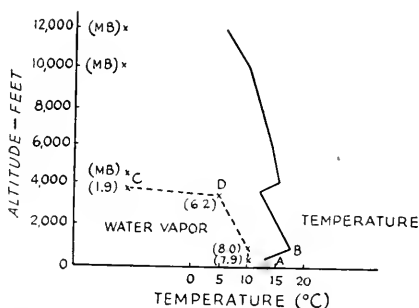


Fig. 2 — Upper-air sounding made at Joliet, Ill., September 6, 1950, at 2200 EST. Superrefraction resulted from the sharp decrease in water-vapor content (CD). Points marked (MB) indicate motorboating in the radiosonde unit at low relative humidity levels.

altitude. No water vapor scale is shown as it would be different at each altitude. At certain minimum values of relative humidity, the radiosonde instrument transmits only a very low audio frequency. Where this occurs, MB (motorboating) is shown on the water vapor curve.

Superrefraction occurs with either (1) a temperature inversion exceeding 2.8° centigrade per 100 feet or (2) a rate of decrease of water vapor exceeding 0.5 gram per kg. per 100 feet.<sup>2</sup>

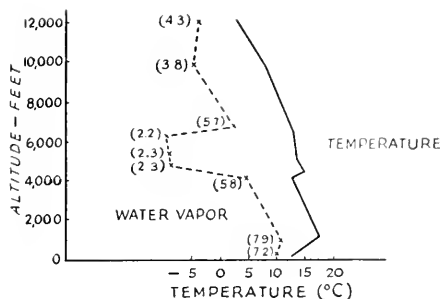


Fig. 3 — Upper-air conditions at the eastern end of the W9EQC-W2NLY path are shown by this sounding made at Albany, N. Y., on September 6, 1950, at 2200 EST. Superrefraction at 4000 feet altitude is indicated by the water-vapor curve.

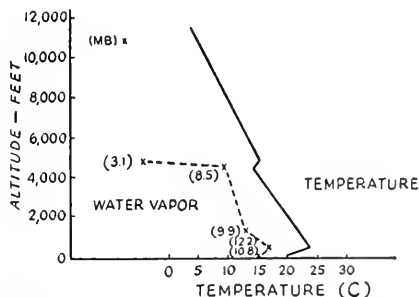


Fig. 4 — Some idea of the upper-air conditions at Collierville, Tenn., can be gained from this upper-air sounding made at Nashville, Tenn., on October 30, 1950, at 2200 EST. The water-vapor gradient at 5000 feet was more than four times that necessary for superrefraction when W4HHK worked W3NKM, Pittsburgh, Penna.

In Fig. 2, the temperature at the inversion *AB* is seen to increase from 13°C to 18°C through an altitude difference of 800 feet. The gradient is therefore  $(18-13)/8 = 0.6^\circ\text{C}$  per 100 feet and is insufficient for superrefraction. At *CD* on the water-vapor curve, there is a decrease from 6.2 grams per kilogram to 1.9 grams per kilogram through an altitude difference of 400 feet. The gradient is  $(6.2-1.9)/4 = 1.1$  grams per kilogram per 100 feet, giving us a level of superrefraction.

Now let's see how some soundings check out with various 2-meter band openings.

On the evening of September 6, 1950, W2NLY, Oak Tree, New Jersey, worked W9EQC, Aurora, Illinois, a distance of nearly 750 miles. The nearest available sounding for the eastern end of this path is one made at Albany, New York. It is shown in Fig. 3. The sounding of Fig. 2, already discussed, is representative of conditions at the western end of the path.

On October 30, 1950, W4HHK, Collierville, Tennessee, contacted W3NKM, Pittsburgh, Pennsylvania, about 650 miles. The Pittsburgh sounding is plotted in Fig. 5, while the Nashville, Tennessee, sounding in Fig. 4 shows the probable conditions at Collierville.

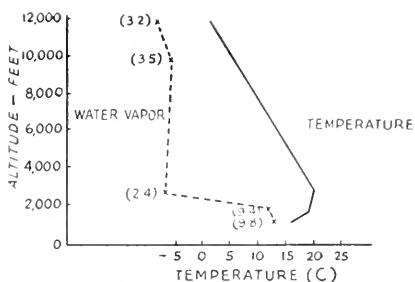


Fig. 5 — Conditions at the eastern end of the W4HHK-W3NKM QSO are shown by this sounding made at Pittsburgh, Penna., on October 30, 1950, at 2200 EST. The rate of decrease of water vapor with height beginning around 2000 feet altitude is about 75 per cent greater than needed for superrefraction.

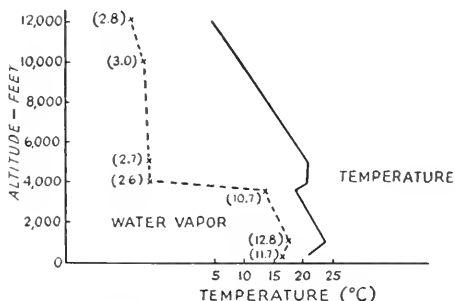


Fig. 6 — Upper-air sounding made at Toledo, Ohio, on July 23, 1949, at 2200 EST. The water-vapor gradient between 3000 and 4000 feet is more than three times that needed for superrefraction.

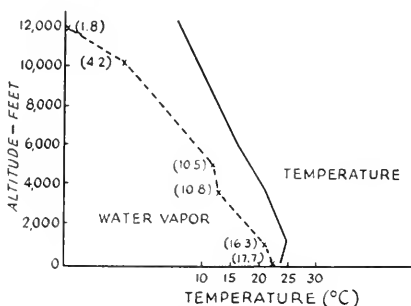


Fig. 7 — This sounding made at Charleston, S. C., on July 23, 1949, at 2200 EST shows why a Michigan-South Carolina contact was not made in spite of good conditions in the northern states. Only weak temperature and water-vapor gradients are evident.

In none of these soundings do the temperature inversions meet the criterion for superrefraction, but in every case there is a superrefracting water-vapor gradient.

With only surface weather data available to him, W2BAV expressed the view that a South Carolina-Michigan contact was apparently missed for lack of activity on July 23, 1949. While Michigan conditions were favorable as

shown by the Toledo, Ohio, sounding in Fig. 6, conditions in South Carolina were something different. The Charleston sounding (Fig. 7) does not show any water-vapor gradient steep enough nor any temperature inversion strong enough to produce superrefraction.

From this it may be seen that upper-air sound-

ings are the only reliable source of information as to where and when tropospheric DX may be worked. The isobars (lines of common atmospheric pressure) shown on daily weather maps provide good clues, but they are not infallible, as any experienced and observant v.h.f. man will testify.

## The Little Shack

### *A Neat Installation for the Living Room*

BY LEN H. SMELTZER,\* W4KZF

**P**ROBABLY many XYLS have frowned on having the ham shack in the living room because it doesn't look much like normal home furnishings. We wanted to put a small transmitter and receiver in the living room so we wouldn't spend all our time in the basement, so the question of a suitable enclosure immediately presented

small speaker, and similar gadgets, when closed. Sufficient space (approximately one inch) was left on top and on each side of the transmitter compartment for air circulation, and the backs of both compartments were left open for the same reason. The panel under the transmitter, near the floor, has sufficient room on the rear for mounting

❧

Cabinet fronts drop down to give access to equipment. They double as operating-table space when W4KZF is on the air.



Although simple in construction, the "little shack" fits in with its surroundings and conceals the appurtenances of the ham station.

❧

itself. When the 16-year-old junior operator came up with a design for a modern cabinet that met with the approval of the XYL, he and yours truly went to work with some 3/4-inch plywood, glue, and nails. The result is shown in the photographs.

This cabinet was built to size for a Viking Ranger and BC-342N receiver, with additional space in the receiver compartment for the control panel and Q-5er, plus storage space for mike, key,

\* Box 205, R.R. 2, Ludlow, Ky.

balun coils and an antenna relay out of sight.

Details of construction will not be given here because the sizes of the compartments will vary with each installation to accommodate the equipment in use. Also, the accessory equipment used with the receiver will help to determine the size of that compartment. Our purpose here is just to give an idea of what can be done with a little 3/4-inch plywood. If you can't build it yourself, maybe you have a friend or relative who likes to do a little woodworking.

# The S-FS Indicator

## A Signal/Field-Strength Meter for Mobile Use

BY C. VERNON CHAMBERS, W1JEQ

• The combination is a natural for mobile work. It will be found indispensable in the adjustment and servicing of receiving, transmitting and antenna systems. It is also most useful in transmitter hunting — a mobile activity that is enjoying widespread popularity.

SEPARATE UNITS for measuring signal and field strength were described by W8IWB and W0WLR in an earlier issue of *QST*.<sup>1, 2</sup> Both of these used a 1-ma. meter as the visual indicator, and a 500-ohm potentiometer for adjustment. The S-FS Indicator combines the original circuits in a compact package permitting a single meter and potentiometer to do double duty. The cost of the dual-purpose unit is very little more than that of either instrument alone.

The unit is small enough for mounting either above or under the dashboard of a car, or it may be stored in the glove compartment when not in use. It is housed in a 4 × 5 × 3-inch gray hammertone box and, complete with a new meter, costs approximately \$17.00 to build.

A simple toggle switch changes from one function to the other. Power drawn from the broadcast receiver for the S-meter circuit is less than 2¼ watts. The field-strength circuit requires no external power.

The field-strength meter can be used installed in the car as an antenna-resonance indicator or as an output indicator for transmitter adjustments, as described by Abel, or it can easily be removed for antenna-pattern plotting, adjustment of other mobile installations or even for use in the home station. The sensitivity adjustment makes the indicator useful over a wide range of field strengths.

One handy feature of the S-meter arrangement is the sensitivity control. This control can be adjusted to prevent extremely strong signals from pinning the meter. When working with really weak signals, the sensitivity control may be adjusted to provide a noticeable meter deflection.

Aside from ordinary signal-strength work, the S-meter may be used to advantage when aligning converter or receiver circuits, and it is worth its weight in gold in adjusting antenna trap circuits to suppress QRM from b.c. signal feed-through in converters.<sup>3</sup> Mobiles interested

in transmitter hunting will find the indicator indispensable when used in conjunction with a directional loop.

### Circuit

The circuit of the S-FS Indicator is shown in Fig. 1. A 12AX7 is used in the S-meter section. One grid is returned directly to chassis and the second grid is connected to the sensitivity control,  $R_1$ . The input end of  $R_1$  is returned, via  $J_2$  and a shielded cable, to the a.v.c. line in the b.c. receiver. The plates of the 12AX7 are con-



A front view of the S-FS Indicator. The zero-adjust control is to the right of the toggle switch,  $S_1$ . The meter registers either signal or field strength, depending upon the setting of the toggle switch.

needed in parallel and then, through a single lead, to  $J_2$ . Fig. 1 shows heater wiring for both 6- and 12-volt operation. Pin 9 of the tube is not used in the 12-volt circuit.

For S-meter operation, the meter and  $R_2$  are switched across the cathode terminals of the tube by  $S_1$ . The 500-ohm potentiometer,  $R_2$ , becomes a zero-adjust control. Zero reading is obtained with  $R_2$  adjusted for equal voltage at Pins 3 and 8 of the 12AX7. After an initial zero adjustment, the application of a.v.c. voltage through  $R_1$  will drive the cathode of  $V_{1A}$  negative with respect to the cathode of  $V_{2B}$ , thus upsetting the meter balance and causing an upward deflection. For a given a.v.c. voltage,

<sup>1</sup> Amfahr, "Unidirectional Loops for Transmitter Hunting," *QST*, March, 1955.

<sup>2</sup> Abel, "The 'Hidden Gem,'" *QST*, March, 1955.

<sup>3</sup> Chambers, "Bandswitching a Crystal-Controlled Mobile Converter," *QST*, January, 1955.



The bottom view shows the r.f. choke and the disk capacitors for the field-strength circuit mounted on a 2-terminal tie-point strip at the right side of the unit. The extra terminals on the

the amplitude of the deflection will be controlled by  $R_1$ .

The S-FS Indicator uses a Type 12AX7 in preference to the 6SN7 employed by WØWLL because it draws considerably less plate current. This saving is important if power for the S-meter, as well as the converter, is taken from the b.c. receiver. The 6SN7 and its prototype (12BH7) will work well in the circuit, but only at the expense of increased current drain.

The circuit of the field-strength section is electrically equivalent to the one described previously.<sup>2</sup> It is made active by switching the meter and  $R_2$  into the circuit and by applying r.f. through  $J_1$ . The amount of r.f. fed to the circuit may be controlled by adjusting the length of the pick-up antenna attached to  $J_1$ .  $R_2$  is a shunt to prevent off-scale readings when measuring strong r.f. fields.

### Construction

As shown in the top view, the Triplett model 227-T meter is mounted on the front panel of the utility box. If the meter is centered with its top edge  $1\frac{3}{8}$  inches down from the top of the panel, the barrel of the meter will not strike the folded-over lips at the front of the box when the unit is assembled.  $S_1$  and  $R_2$  are below the meter with a  $1\frac{1}{2}$ -inch space between mounting centers. Each control is centered  $1\frac{3}{8}$  inches up from the bottom of the panel.

The rear and the bottom views show the "U"-shaped chassis made from 1/16-inch thick aluminum stock. The width, depth and height of the chassis are 2 7/8, 3 and 1 11/16 inches, respectively. Panel-mounted controls ( $R_2$  and  $S_1$ ) clamp the chassis against the rear of the front panel as shown in the bottom view. A

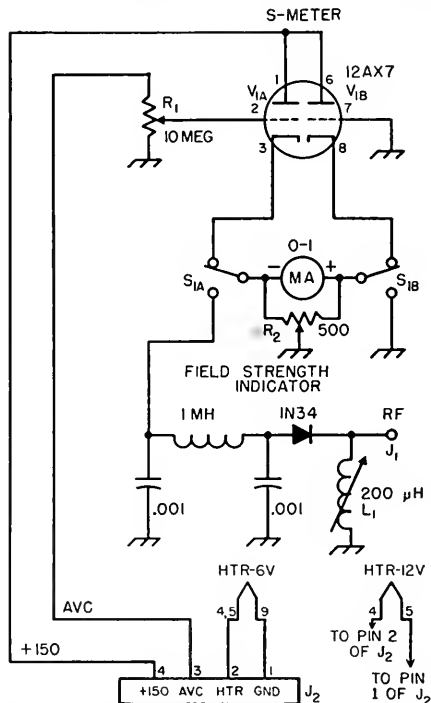


Fig. 1 — Circuit diagram of the S-FS Indicator.

slug-tuned coil are used for mounting the 1N34 crystal diode. Ordinary hook-up wire is used throughout.

### Installation

Heater, plate and a.v.c. voltages for the S-meter are obtained from the car b.c. receiver and should be brought to the indicator through shielded leads. A suitable cable can be made from lengths of Belden No. 8885 shielded wire. The heater lead may be tapped onto the hot side of any receiver tube (it is a good idea to stay clear of the rectifier tube) close to a hole or receptacle provided for the output cable. The plate lead may be connected to the screen pin of an audio output tube socket, to a low-voltage tap on the power supply or to any other point delivering approximately 150 volts (higher voltages merely increase the current drain unnecessarily). A series resistor may also be used to drop the voltage. It should have a value of approximately 285 ohms for each volt in excess of 150.

Finding the a.v.c. line in a car b.c. receiver is not always an easy job unless you are lucky enough to have a circuit diagram and a layout plan. It is frequently possible to spot the line by tracing back from the control grid of either the r.f. amplifier tube or the converter. The grid of each tube is usually returned to the a.v.c. bus through a  $\frac{1}{2}$ - to 1-megohm resistor. If you test a junction for a.v.c. voltage, just connect a high-resistance d.c. voltmeter between the point and ground and watch for a negative reading that increases with increased signal input. Local b.c. stations can supply the test signals.

After the interunit cabling has been completed, the receiver may be returned to the dash of the car. The performance of the S-meter may now be checked by tuning in signals — either amateur or b.c. — and observing the deflection of the meter. If b.c. station signals cause only a small

deflection, it indicates that  $R_1$  is adjusted toward minimum sensitivity. In that case, readjust  $R_1$ , zero the meter by means of  $R_2$ , and try again. It is necessary to reset the zero-adjust control each time that the sensitivity control setting is altered. Of course, if signals tend to pin the meter, the sensitivity can be reduced by adjustment of  $R_1$ .

With 150 volts applied to the plates of the 12AX7, with the grid of  $V_{1A}$  grounded ( $R_1$  at minimum sensitivity position), and with the meter adjusted to zero, the tube should draw about 3.5 ma. The voltage at the two cathode terminals, Pins 3 and 8, should be 0.4 volts.

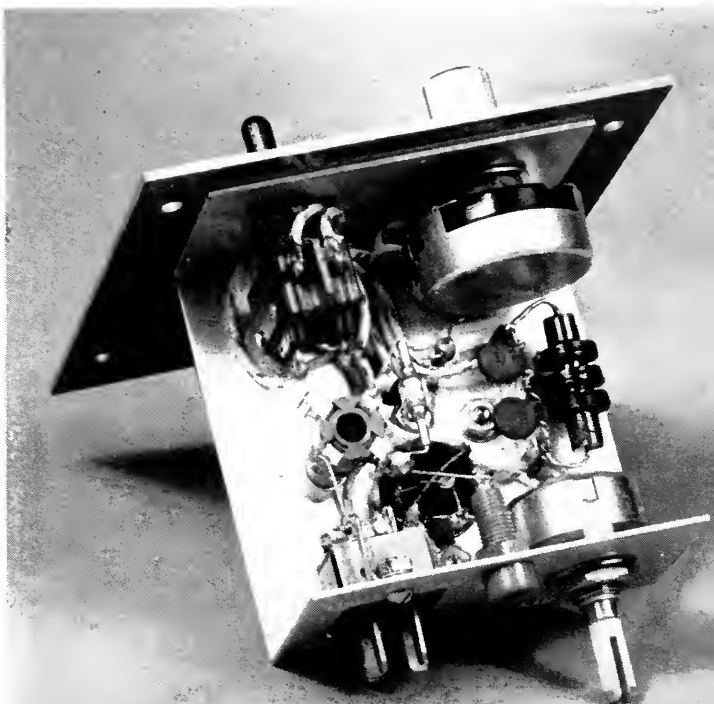
The field-strength meter can be most quickly tested by using the mobile transmitter as the source of signal. Either a short length of wire, the b.c. antenna, or an insulated fender guide<sup>2</sup> may be used as the r.f. pick-up. Just terminate the pick-up antenna at  $J_1$ , throw  $S_1$  to the proper position, adjust  $R_2$  for maximum resistance across the milliammeter, turn on the transmitter and watch the needle. Lengthen the pick-up antenna if the meter deflection is not great enough, or regulate the shunt,  $R_2$ , if the reading is too high. It is just as well to shorten the pick-up antenna a bit if the shunt resistance has to be lowered appreciably. Try and end up with an antenna length that serves the purpose as far as your own installation is concerned and also provides enough pick-up to permit making measurements of a more sensitive nature. The latter would include measuring the field strength from the mobile transmitter of a fellow ham who is parked alongside of your vehicle.

$L_1$  should ordinarily require adjustment only if the indicator is used for checking at 75 meters. In that case, it is advisable to increase the sensitivity to maximum by resonating the coil. Abel has explained why a tuned circuit is not required at the higher frequencies.

◆

The function switch is to the left of the zero-adjust control in this bottom view of the S-FS Indicator.  $R_1$  is at the rear of the unit, just below the 1-mh. r.f. choke.  $J_1$ , on the rear wall of the chassis, is a miniature nylon tip jack. The back cover for the metal box that normally encloses the meter is punched to clear the components mounted on the rear wall of the chassis.

◆



# A Low-Cost Code-Practice Oscillator

## A.C. Power with Safety Features

BY ROBERT E. FOLTZ,\* W9GBT

**I**N looking for a good design for a code-practice oscillator, certain requirements were established: The unit must be powered from the a.c. line yet provide complete isolation for safety; there should be no shock hazard in the keying circuit; and in addition, speaker operation was desired without added cost or circuit complication.

Units have been described using a filament transformer for the tube heaters, with the plate voltage obtained from batteries or a rectifier supply. A study of transformers available disclosed a type used in TV boosters having a plate winding of 110 to 150 volts at 15 to 25 ma., in addition to a filament winding, at a cost of only fifteen cents more than a single filament transformer.

A selenium rectifier was first considered for ob-

• Using a TV horizontal-oscillator coil in the oscillator circuit makes it possible to drive a speaker voice coil without a matching transformer. Combined with a "booster" transformer, the result is an inexpensive self-contained code-practice oscillator.

taining the necessary d.c. plate voltage, but further study indicated that a dual-triode tube would be more economical in both cost and space, by using one section as a half-wave rectifier and the other as the audio oscillator.

The ordinary audio-oscillator circuit calls for an audio interstage transformer, which accounts for a good portion of the total parts cost. In this design, a horizontal-oscillator coil, as employed in TV receivers, is used in the feed-back circuit. In addition to economy, the adjustable ferrite core provides the means for adjustment of tone without the added cost of the usual potentiometer.

The number of components in the circuit of Fig. 1 is small, as all frills were eliminated in the interests of simplicity and low cost. New parts as checked in a catalog total under \$6.00, not including the speaker or cabinet. Many of the parts can be found in special sale catalogs or at bargain counters at most of the larger supply houses. The parts for this particular unit, bargain-purchased, amounted to only \$4.03. An additional \$1.05 provided a 2-inch speaker.

### The Circuit

Referring to the circuit, it will be noted one triode section of the 12AU7 functions with grid and plate tied together as a half-wave rectifier. The 270-ohm resistor in the cathode lead limits

(Continued on page 110)

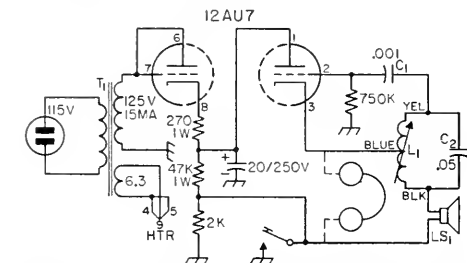


Fig. 1 — Circuit diagram of the low-cost code-practice oscillator.

C<sub>1</sub> — Disk ceramic.

C<sub>2</sub> — Paper.

L<sub>1</sub> — 100 mh., adjustable (TV horizontal oscillator coil, GE type RLC-091 or equivalent).

T<sub>1</sub> — Power transformer, 110–150 volts at 15–25 ma.; 6.3 v. at 0.3 amp. (Stancor PS8415, Merit P3046, or equivalent).

LS<sub>1</sub> — 2-inch speaker, 3- to 4-ohm voice coil.

Headset may be connected as shown by dotted lines. Resistors are  $\frac{1}{2}$  watt unless noted otherwise. Capacitances are in  $\mu$ f.

\* 1214 Fourth Avenue, Sterling, Illinois.



The author's oscillator is built in a plastic cabinet taken from a surplus electric-blanket control. The knob on the left is the a.c. switch; the key plug is inserted through the hole at the right.



# A 28-Mc. Civil Defense Package

*Three-Channel Fixed-Portable-Mobile Station for Emergency Use*

BY PHILIP S. RAND,\* WIDBM

• The three basic units — transmitter, receiver, power supply — of an emergency station have to be coordinated electrically as a matter of practical operation. Here's a "package" that carries the coordination still further, putting three identical-size units into a compact station that can be picked up and carried anywhere in one piece, yet which can readily be separated into components for separate use or servicing. Utility and appearance are combined without excessive cost.

THE EQUIPMENT to be described is the result of the efforts of three amateurs who joined together to solve a civil defense communications problem in a small Connecticut town. This same problem probably exists in hundreds of other small communities all over the country.

Redding, a rural community with a population of only about 2500, is situated in the hills of Connecticut about sixty miles northeast of New York City and about twenty miles northwest of Bridgeport, Connecticut. The people live in a number of small villages scattered throughout the town limits. Redding is one of the twenty-two towns and cities which constitute "Area One" of the State of Connecticut Civil Defense system. Area One is one of the most active civil defense areas of Connecticut. Unfortunately for Redding there are only three amateurs in the town, two of whom are already up to their ears in c.d. work at Area Headquarters.

One of the problems was how to organize an

efficient RACES program with only one ham available locally. Another problem was that of obtaining appropriate station equipment without any funds, because it was found that although Redding had the nucleus of a c.d. organization it was not active and there was no money for radio gear. The third problem was how to make the c.d. organization in Redding more active so it would take part in the weekly training exercises. It was sort of like the old question of which came first, the chicken or the egg: No c.d. activity, no communications; no communications with the rest of the area, no activity locally. Past experience with other towns in Area One had shown conclusively that if radio communications could be set up and maintained between an inactive town and Area Headquarters, interest in all branches of the local c.d. set-up was stimulated enough to spark the whole operation into life.

WIDBM, W1KGT and W1ODW held a meeting, procured an egg, and hatched out the following:

1) They formed a bona fide radio club with themselves and their XYLS as members and applied to FCC for a club radio station license. This station was to be the local c.d. station for contact with Area Headquarters and was to be located at c.d. headquarters in the Town Hall. FCC issued a station license, W1DUL.

2) Through notices in the newspapers, at the school and by word of mouth, they were able to get about ten new members for the radio club. All of the non-amateur members are obtaining Restricted Radiotelephone Permits from FCC, are being trained in RACES operating procedure, and will be used as operators.

3) W1ODW was appointed Redding Radio Officer by the local c.d. director, and he imme-

\* Redding Ridge, Conn.

(Left): The three units assembled in their carrier. Transmitter, receiver, and power supply are included in the "package." The outfit can run either on regular a.c. or on a 6-volt battery supply. The carrier is made from a cut-down ½-inch aluminum relay rack panel as a base, with aluminum uprights and crosspiece supporting the handle. Individual units are fastened to the base with screws. (Right): Rear view of the assembled station shows the converter mounted in place on the back of the receiver.



diately made out the necessary RACES application forms tying Redding into the Area and State RACES plan. These forms were forwarded to the State Radio Officer.

4) Redding had previously been assigned to the Area ten-meter net. W1DBM, W1KGT and W1ODW pooled ideas and parts and divided up the actual work in designing, constructing and installing a complete ten-meter c.d. station for the town. The station will, of course, be owned and operated by the Redding Radio Club, with one of the amateur members as Trustee.

When planning a RACES station like this, it must be kept in mind that it will take more than just one radio operator to man it. A typical c.d. set-up would require:

- a) one Communications Officer with three assistants or alternates (in charge of all types of communications);
- b) one Radio Officer with three alternates (in charge of all radio communications);
- c) three dispatchers;
- d) one chief operator in charge of all operators;
- e) one technician in charge of all equipment;
- f) four radio operators for each transmitter in use;
- g) at least four messengers for delivering messages.

This makes a total of twenty-four people for a one-transmitter station, a rather imposing list; however, all RACES stations should be organ-

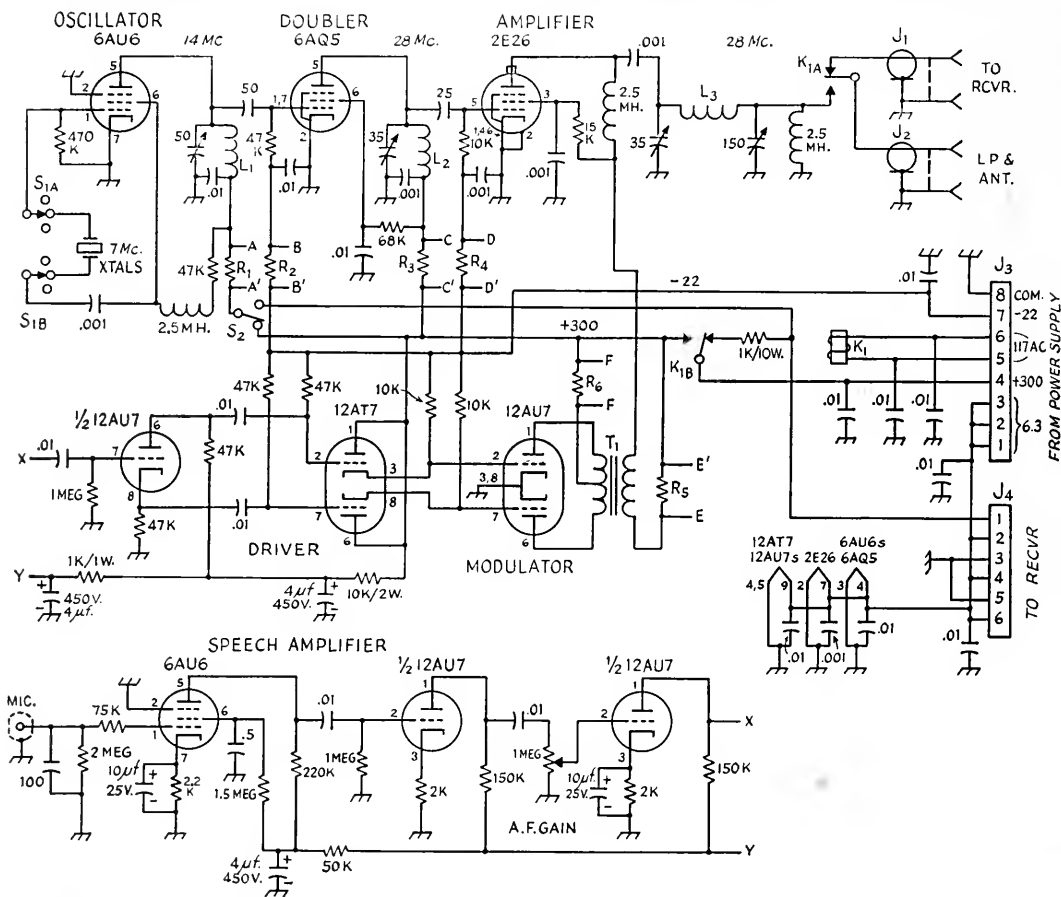


Fig. 1 — Circuit diagram of the transmitter and modulator. Capacitances below 0.001  $\mu$ f. are in  $\mu$ f. Fixed capacitors up to and including 0.01 are ceramic. Resistors are  $\frac{1}{2}$  watt unless otherwise indicated.

R<sub>1</sub>, R<sub>3</sub>, R<sub>5</sub>, R<sub>6</sub> — Meter shunt, for 100-ma. full scale (approximately 0.16 ohm, or approx. 5 ft. No. 24 enam. wound on 1-watt resistor).\*

R<sub>2</sub>, R<sub>4</sub> — Meter shunt, for 5-ma. full scale (25 ohms).\* L<sub>1</sub> — 4  $\mu$ h.; 20 turns No. 26 on  $\frac{1}{2}$ -inch diam. form, winding length 1 inch, slug-tuned.

L<sub>2</sub> — 1.5  $\mu$ h.; 14 turns No. 20 on  $\frac{3}{8}$ -inch diam. form, winding length 1 inch, slug-tuned.

L<sub>3</sub> — 1.3  $\mu$ h.; 9 turns No. 12, diameter  $1\frac{1}{8}$  inches, length  $1\frac{1}{4}$  inches, self-supporting.

J<sub>1</sub>, J<sub>2</sub> — Coaxial connectors, chassis type.

J<sub>3</sub> — 8-contact connector, chassis-mounting (octal).

J<sub>4</sub> — 6-contact connector, chassis-mounting (Jones).

K<sub>1</sub> — D.p.d.t. relay, 117-volt a.c. coil (Advance type AM/2C/115VA).

S<sub>1</sub> — Rotary switch, 2 poles, 3 positions.

S<sub>2</sub> — S.p.d.t. toggle.

T<sub>1</sub> — Modulation transformer, 10,000 ohms to 3000, 5000, or 8000 ohms (Triad type M-3X).

\* These values for a surplus meter taken from the r.f. indicator of ARC-5 equipment. Values should be adjusted to fit when other types of meters are used.

NOTE: Connections indicated by A-F and A'-F' inclusive go to corresponding letters on meter switch (in power-supply unit) through a 12-wire cable. Plug-and-socket wiring for the meter cable is omitted from these diagrams for simplification.

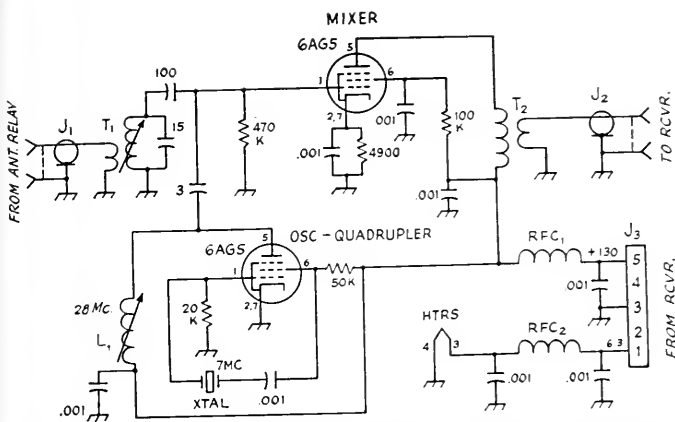


Fig. 2 — Crystal-controlled 28-Mc. converter. The 0.001- $\mu$ f. capacitors are disk ceramic; others may be either mica or ceramic. Capacitances below 0.001  $\mu$ f. are in  $\mu$ f. Resistors are  $\frac{1}{2}$  watt, carbon.

- L<sub>1</sub> — 16 turns No. 24 enam. close-wound on  $\frac{1}{2}$ -inch diam. slug-tuned form (National XR-50). Inductance adjusted to resonate with tube and stray capacitances at 4th harmonic of crystal.
- J<sub>1</sub>, J<sub>2</sub> — Coaxial connectors, chassis-mounting type.
- J<sub>3</sub> — 5-contact connector, male, chassis-mounting (5-prong plug).
- RFC<sub>1</sub> — 21  $\mu$ h. (Ohmite Z-28).
- RFC<sub>2</sub> — 7  $\mu$ h. (Ohmite Z-50 or 2-watt resistor wound full with No. 20 enam.).
- T<sub>1</sub> — Grid coil approx. 1.5  $\mu$ h.: 13 turns No. 24 enam. close-wound on  $\frac{1}{2}$ -inch diam. slug-tuned form (National XR-50). Antenna coil 4 turns wound at ground end of grid coil.
- T<sub>2</sub> — Untuned b.c.-band r.f. transformer (Miller 472-UA). Leads at ground ends of coils must be unsoldered and separated for making the connections shown above. See text for further modifications.

ized on this basis so they will be adequately staffed for continuous twenty-four-hour operation day after day. Also, bear in mind that if the time ever comes when c.d. communications are vitally needed, half of your personnel may be knocked out or otherwise unavailable, so you need plenty to start with. (Incidentally, all amateur stations not in RACES will be definitely off the air in the event of a national emergency resulting from enemy action.)

Fortunately for small towns with only a few hams, only the Radio Officer, his alternates and the technician need be licensed amateurs. The rest need only hold Restricted Radiotelephone Permits. RACES mobiles can be owned and operated by Restricted Permit holders, if need be.

### Transmitter

In the actual design of the equipment, it was first determined by a mobile test that a 15-watt transmitter with a 10-meter ground-plane antenna would be adequate to span the twelve airline miles from the Redding Town Hall to Area One Control. With this as a basis, it was possible to build a rig with a combination 120-volt a.c./6-volt d.c. power supply so that the transmitter could be independent of power failures. By the addition of a carrying handle, it could also be used as a portable or a mobile if need be.

Going on from this point, a simple yet effective r.f. unit was built and tested using a 6AU6 crystal oscillator followed by a 6AQ5 doubler and a 2E26

final amplifier. The circuit is shown in Fig. 1, along with the 12AU7 Class B modulator. There are three crystal frequencies available, one for the Area channel, one for the local channel and one for the statewide mobile support frequency. In the interests of good audio quality (which cuts down on repeats and fills in handling messages), a crystal microphone was selected and the necessary audio amplification was built in. The 12AU7 Class B modulator was chosen because of its low static plate current. The use of a cathode follower for a driver eliminated the need for a Class B driver transformer.

For simplicity in tuning and antenna loading, a pi network was used in the final plate circuit. The plate tuning and antenna loading controls are the only ones brought out to the front panel. The crystal-oscillator plate and doubler plate are tuned with a screwdriver through suitable holes in the top of the cabinet.

In addition to the crystal switch and the audio gain control, there is a s.p.d.t. toggle switch on the front panel for turning on the crystal oscillator alone so that the transmitter can be spotted on the receiver. This is a big help to inexperienced operators in locating the net frequency.

A small d.p.d.t. 120-volt a.c. relay shifts both the antenna and B-plus from the receiver to the transmitter when the send-receive switch is thrown. This relay is connected to the 120-volt winding on the transformer so that it works regardless of whether a.c. or battery is being used for primary power.

### Receiver

Many ideas on receivers were discussed and rejected, including using a BC-348, a 312, or an ARC-5 with a tunable converter, or rebuilding a junked ham receiver. The amount of work involved in designing and building a complete 10-meter receiver with a good noise limiter, adequate stability, sensitivity, bandspread, and so on, was a little frightening. A good solution finally came when some 144-Mc. technique was borrowed, resulting in a simple crystal-controlled converter ahead of a homemade broadcast receiver. Fig. 2 shows the circuit of the converter, which uses a 7-Mc. crystal and a pair of 6AG5s. Fig. 3 gives the circuit of the tunable i.f. amplifier (540 kc. to 1750 kc.). This has the useful feature that the homemade dial can be calibrated in both 10-meter frequencies and b.c.-band frequencies, and if the

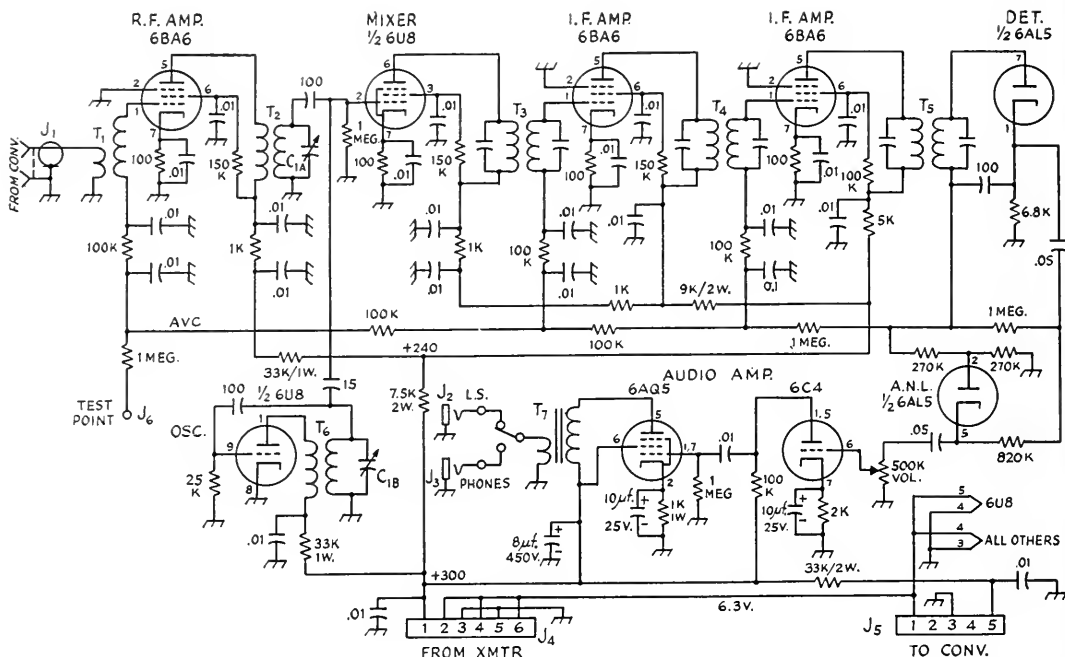


Fig. 3 — Circuit of b.c.-band receiver used with crystal-controlled 28-Mc. converter. Capacitances below 0.001  $\mu$ f. are in  $\mu$ f. Fixed capacitors to 0.01  $\mu$ f. are ceramic. Resistors  $\frac{1}{2}$  watt unless specified otherwise.

C<sub>1</sub> — Two-gang b.c.-receiver tuning capacitor.

J<sub>1</sub> — Coaxial connector, chassis-mounting type.

J<sub>2</sub>, J<sub>3</sub> — Single-circuit 'phone jack.

J<sub>4</sub> — 6-contact connector, chassis-mounting (Jones).

J<sub>5</sub> — 5-contact connector, chassis-mounting (5-prong socket).

J<sub>6</sub> — Pin jack.

T<sub>1</sub> — B.c. antenna coil, untuned (Miller 472-UA modified as described in text).

T<sub>2</sub> — B.c. r.f. coil assembly (Miller 242-RF).

T<sub>3</sub> — 455-kc. i.f. transformer, input type (Miller 012-C1).

T<sub>4</sub> — 455-kc. i.f. transformer, interstage type (Miller 012-C2).

T<sub>5</sub> — 455-kc. i.f. transformer, diode type (Miller 012-C4).

T<sub>6</sub> — B.c. oscillator coil assembly (Meissner 14-4243).

T<sub>7</sub> — Audio output, 4-watt universal type (Stancor A-3856).

NOTE: I.f. transformers, T<sub>3</sub>–T<sub>5</sub>, inclusive, tuned to following frequencies:

Trans.	Pri.	Sec.
T <sub>3</sub>	460 kc.	450 kc.
T <sub>4</sub>	445	465
T <sub>5</sub>	460	455

need arises the converter can be unplugged and the Conelrad channels, 640 kc. and 1240 kc., can be received. These are both marked on the paper dial. Also, other crystal converters, such as for 144 or 50 Mc., can be plugged in either for regular use or for monitoring purposes. The tuning range is about 1210 kc., or from approximately 28.5 to 29.7 Mc. This same range would apply on either 6 or 2 meters, so an appropriate crystal would have to be used in these converters to cover the desired 1.2-Mc. portion of the band.

The untuned r.f. stage used in the broadcast tuner was found necessary to prevent birdies resulting from the two oscillators beating together in the mixer grid circuit. It is recommended that anyone building a similar receiver use a tuned stage of r.f. with a three-gang capacitor instead of the two-gang unit we used. When we discovered the birdies it was too late to install the three-gang condenser, so we did the next best thing and isolated the two oscillators with the untuned stage.

A 6U8 was used as an oscillator-mixer because one was available. A 6BE6, or another type of converter, could have been used just as well.

Two stages of 455-kc. i.f. were used to provide enough gain so that the i.f. transformers could be stagger tuned for a broader passband, making tuning easier for inexperienced operators.

The second detector, a 6AL5, also provides a.v.c. and noise limiting. The audio is conventional, except that a s.p.d.t. toggle switch allows switching from 'phones to loudspeaker when needed. Normally all reception is with 'phones in c.d. work.

### Power Supply

A schematic of the power supply is shown in Fig. 4. A combination a.c./vibrator transformer is used so that primary power can be either regular a.c. or 6 volts d.c. By using 12-contact power plugs, the selection between a.c. and d.c. is made simply by plugging in the proper plug. When the d.c. cable is plugged in the vibrator is automatically connected in the circuit.

The circuit is straightforward, except perhaps for the use of selenium rectifiers. These were used in order to save 2 amp. that would have been needed for heating the rectifier filaments if tube rectifiers had been used. Four 200-ma. selenium

units were used in each stack because they were available; three 75-ma. units could have been used just as well.

The fixed bias, -22 volts, for the r.f. and modulator is obtained from the drop across a 200-ohm 25-watt adjustable resistor in the transformer center tap. This robs 22 volts from the high voltage; however, the drop in plate voltage is not missed, and the system is better than replacing "C" batteries.

### Construction

As can be seen from the photographs, the entire station is made up of three small units. This was done for ease of construction and servicing. In use, these units are all bolted to a common bottom or base plate which is equipped with a carrying handle. In the front-view photograph the transmitter unit is on the left, the receiver is in the center, and the power supply is on the right. The crystal-controlled 28-Mc. converter is attached to the rear of the main receiver and the low-pass filter is tucked in back of the transmitter.

In actual use in the Town Hall, the complete set-up is housed in a plywood cabinet with a hinged door that can be either locked when not in use or can be dropped down for use as an operating table. There are shelves and compartments for the microphone, headsets, logbook, message pads, and similar accessories.

The crystal converter is built in a  $3 \times 4 \times 5$ -

inch utility box with the components mounted on one of the covers. This box is attached with small aluminum brackets to the top rear of the main receiver.

The transmitter, receiver and power supply are each constructed on a standard  $3 \times 5 \times 10$ -inch aluminum chassis equipped with homemade front and rear panels 8 inches high. The panels have  $\frac{1}{2}$ -inch lips folded over so that the perforated aluminum sheet (Reynolds "do-it-yourself" material now available in most hardware stores) for the shielding can be secured with sheet metal screws. In our case we completed all three cabinets (all holes drilled and punched) and then, after assembling them, sprayed them with grey wrinkle enamel. Baking under some infrared heat lamps finished the paint job. Next, Tekni-Label decals were applied and the result was a professional-looking job.

On the transmitter chassis the speech amplifier tubes are across the rear, separated by the modulation transformer from the r.f. The crystal oscillator is in the center of the chassis and the final amplifier is toward the front panel. The antenna relay is just behind the antenna loading condenser.

The two coax cables from the connectors on the rear panel run to a bracket just behind the relay. One of these goes to the antenna and one to the converter.

Because of lack of space in the r.f. unit, the

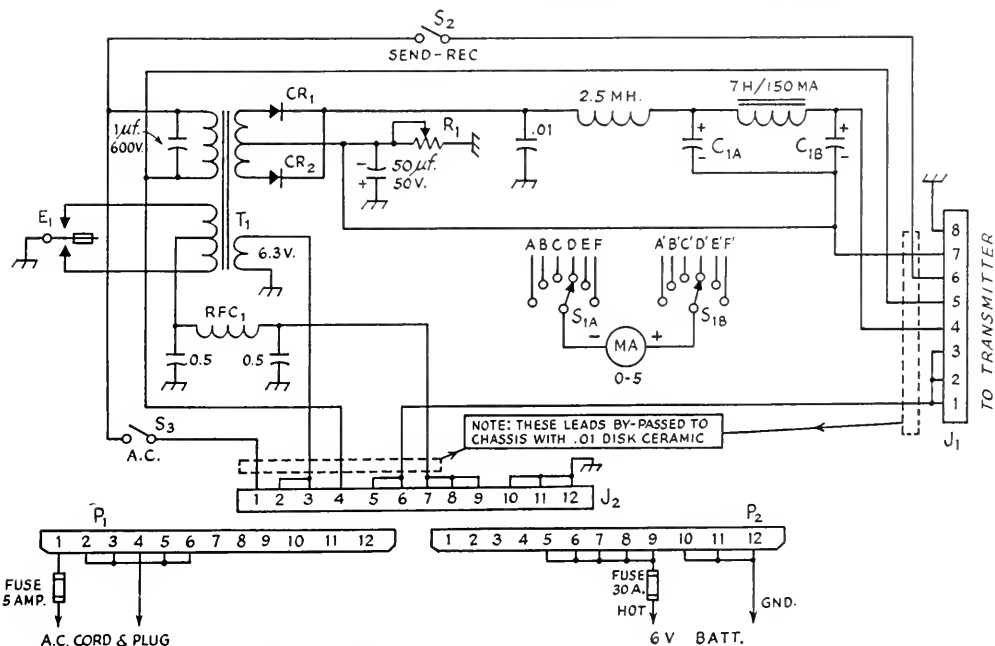


Fig. 4—Power-supply unit. Capacitances are in  $\mu$ f.

C1A, C1B—20- $\mu$ f. 450-volt electrolytic (Mallory FP434, with 10- $\mu$ f. units paralleled. Can must be insulated from chassis).

R1—200 ohms, 25 watts, adjustable; set to 166 ohms.

CR1, CR2—Selenium rectifiers; see text.

J1—8-contact connector, chassis-mounting (octal).

J2—12-contact connector, chassis-mounting (Jones).

P1, P2—12-contact connector, cable-mounting (Jones).

S1—2-pole 6-position wafer switch.

S2, S3—S.p.s.t. toggle.

T1—Combination a.c.-vibrator power transformer, 325 v. d.c. at 135 ma.; 6.3 v. at 4.7 amp.; 6-8 v. d.c. and 117 v. a.c. primaries (Thordarson T-22R24).

E1—Vibrator (Mallory type 294).

meter and the meter switch are both located in the power supply and a 12-wire cable interconnects these two units. The meter shunts, however, are in the transmitter. These must be tailored to fit the particular meter.

The vibrator and the filter condenser can be mounted along the rear edge of the power supply chassis. The power transformer occupies most of the space in the middle. The selenium rectifiers are mounted on two 5-inch 6-32 threaded rods between two aluminum end brackets, toward the front just behind the 2-inch milliammeter. The filter choke is mounted under the chassis in the center while the r.f. choke for the battery lead is just to the rear.

Note that all terminals of the output cable sockets are by-passed with 0.001 disk ceramic capacitors. In the transmitter unit this keeps TV harmonics from escaping, while in the power supply it keeps vibrator hash in its place. In the receiver it helps to keep the two oscillators from beating together. This by-passing also helps to keep broadcast signals from entering the receiver via the power leads. These precautions may not be needed in every installation, but since it was easier to put the by-passes on before installing the sockets we put them on "just in case." All 0.001 and 0.01 capacitors are of the disk ceramic type, including the audio coupling units. This makes for a very neat and compact wiring job.

In laying out the receiver chassis, the tuning capacitor had to be mounted slightly off center to allow room for the shield cans of the r.f., mixer and oscillator coils which line up on the left. The i.f. transformers and tubes are along the right side, with the two audio tubes on the rear edge. Miscellaneous components are grouped on terminal boards on either side under the chassis. The volume control is mounted on a small bracket toward the rear so as to be near the first audio stage. The audio output transformer is mounted near the output tube, with shielded leads running to the 'phones-speaker switch up front and thence back to the two jacks.

The dial was made by cutting and filing an

aluminum frame to mount over white cardboard on which the frequencies were lettered in India ink. The knob itself is one from the junk box with a celluloid pointer attached. A vernier action dial would be more suitable, if available.

The i.f. output coil of the converter is a broadcast-band untuned antenna coil hooked up in reverse. If the builder should use this same coil, it will be necessary to separate the two windings, the ground ends of which are both soldered to the same lug on the coil form, and connect the antenna-winding lead to the spare lug. This prevents B-plus from appearing on the output winding. It was found that this particular coil resonated near 600 kc., so about half the turns were removed from the "grid" winding and the output was much more uniform across the 10-meter band. These same modifications were made to the untuned r.f. stage in the receiver proper, to make the coil tune better and to avoid shorting out the a.v.c. Before removing turns it is well to check the receiver response to see if such modification will be necessary.

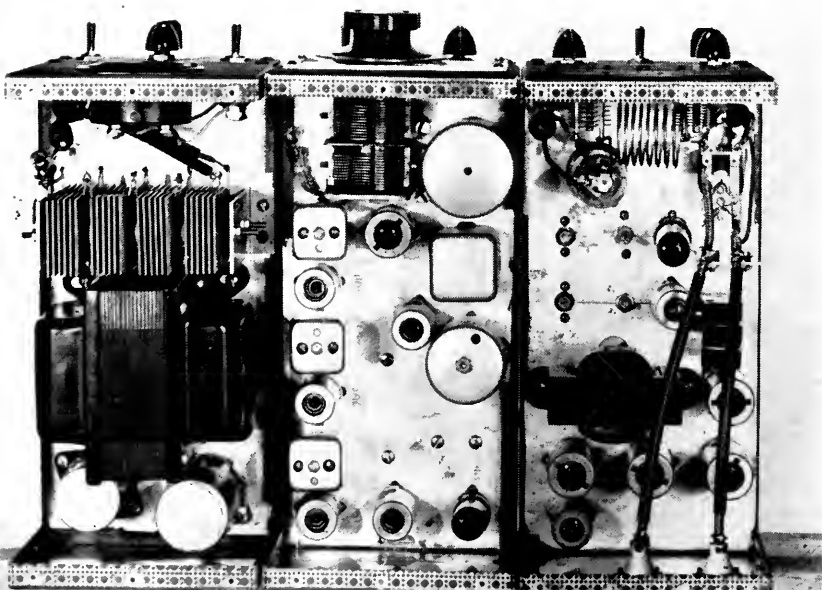
The interconnecting power and coax cables all connect to the rear of the chassis and are about 24 inches long so that the various units may be readily separated and turned upside down for testing and servicing.

### Testing

After all four units are assembled and wired, the power supply should be tested first. Check the circuit over before turning on the power, to be sure there are no mistakes or shorts. Remember that the negative side of the filter capacitors goes to the -22 volts, not to ground; there will be a bad a.c. hum in the audio if the capacitors are grounded. With no load the B-plus voltage will run around 400 or higher, but with full load on transmitting it is down to about 300 volts.

The voltage during receiving runs about 350 volts but is reduced in the receiver by the rather high values of decoupling resistors used in addition to a series resistor in the transmitter unit.

Alignment of the receiver follows usual prac-



Top view of the three units with covers off; transmitter at right, receiver in center, and power supply at left. Layout details are discussed in the text.

The perforation pattern on the bent-over edges of the front and rear panels results from spray-painting the cases with the covers in place. This avoids necessity for subsequent scraping of paint to make good electrical contact with the perforated shields.

**TABLE I**  
**Voltage Measurements with V.T. Voltmeter at Tube Sockets**

Receiver		Grid	Plate	Screen	Cathode	Grid Ma.	Plate Ma.
6AG5	mixer	0 v.	130 v.	110 v.	3.5 v.		
6AG5	crystal oscillator	- 5.	130	80	0		
6BA6	r.f.	- 3.5	200	75	.3		
6U8	mixer	-10.	175	75	.25		
	oscillator	-38.	100	—	0		
6BA6	1st i.f.	- 3.5	170	70	.25		
6BA6	2nd i.f.	4.	230	105	.6		
6C4	1st a.f.	0	110	—	5.		
6AQ5	audio output	0	300	300	23.		
<b>Fully Loaded Transmitter</b>							
6AU6	crystal oscillator	-30. v.	300 v.	180 v.	0		—
6AQ5	doubler	-45.	300	210	0		.5
2E26	final amp.	-65.	275	150	0		3.5
6AU6	1st speech amp.	0	170	55	1.4 v.		
1/2 12AU7	2nd speech amp.	0	75	—	3.5		
12AU7	3rd speech amp.	0	85	—	3.5		
	phase inverter	0	250	—	16.		
12AT7	1/2 driver	-22.	300	—	-16.		
	1/2 driver	-22.	300	—	-16.		
12AU7	1/2 modulator	-16.	300	—	0		
	1/2 modulator	-16.	300	—	0		

2.4 \*

Trans. Bias Supply      -22 v.      -11 v.  
+HV at input to filter      +335      +375

\* Without speech input.

The receiver section has too much gain with the i.f. transformers tuned on the nose and the full power supply voltage applied, so some trouble from oscillation may result if one attempts to operate it in that fashion. As pointed out earlier, large decoupling resistors were intentionally used to drop the plate voltage, and the i.f. transformers were stagger-tuned to increase the i.f. bandpass for easier tuning.

The two oscillators, one in the converter and one in the receiver, should both be operated at as low a value of plate voltage as is consistent with good mixing. This keeps the amplitude of any beats or birdies as low as possible, birdies always being a problem in double-conversion receivers. A final check should be made, after the unit is operating, to

tice. Feed a signal from a signal generator at 455 kc. into the last i.f. grid and align  $T_5$  first, then work toward the mixer one stage at a time, reducing the output of the signal generator each time so that nothing overloads. A vacuum-tube voltmeter plugged into the a.v.c. test jack makes both a good S-meter and an alignment indicator. The i.f. should be stagger-tuned according to the frequencies given in the caption for Fig. 3.

After aligning the i.f., proceed with the r.f. and mixer stages. When the receiver proper is lined up so that it works well on the broadcast band, the converter may be tested. Check the two r.f. coils with a grid-dip meter after they are wired, but with the tube filaments turned off. The crystal-oscillator plate coil should dip at around 28 Mc. while the mixer coil should show resonance at about 29 Mc.

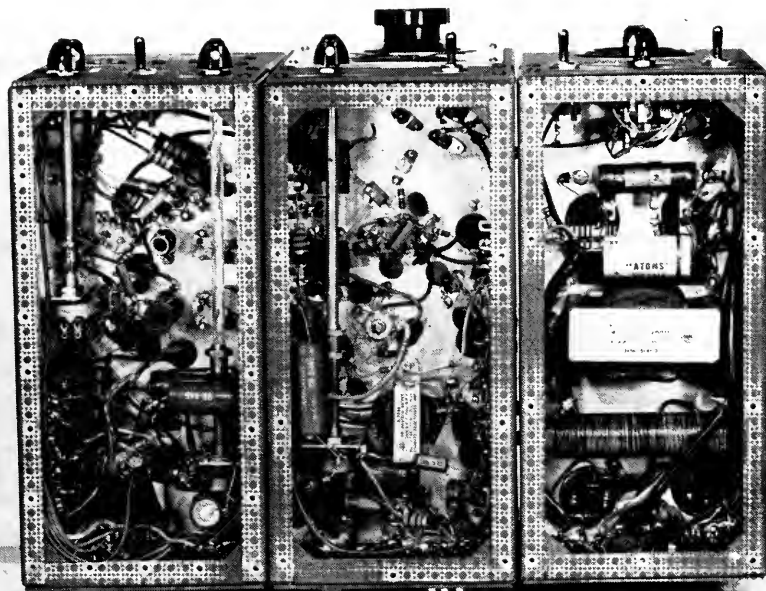
make sure that the voltages at each tube socket are near those given in Table I. If they differ appreciably, the appropriate resistors should be changed accordingly.

The transmitter coils should be checked with a grid-dip meter to be sure they tune to the right frequencies — the oscillator coil to 14.5 Mc., and the doubler and final coils to 29 Mc. — with their condensers about one-half capacitance. If the transmitter is tuned up on 29.5 Mc., 7-Mc. crystals giving output frequencies from 29.4 to 29.6 may be switched in without any retuning. If you plan to use widely separated frequencies it will be necessary to retune all stages when switching crystals.

No trouble was experienced in getting the transmitter on the air. However, there was a

(Continued on page 112)

Cable connections all terminate at the rear of the chassis (bottom in this underside view). Audio controls are equipped with extension shafts so they can be mounted near the associated tubes and thus avoid undue hum pick-up on leads. If normal wiring and layout practices are observed, there are no critical points other than those mentioned in the text.





# A 500-Watt 144-Mc. Amplifier

*High Efficiency at Moderate Cost with War-Surplus Triodes*

BY LEONARD F. GARRETT,\* W7JIP

THE idea of running high power is attractive to many 2-meter men, but the cost of the tubes and other components often proves to be a stumbling block. The amplifier described here doesn't quite make the kilowatt level, but it will handle 500 watts with ease, and with good efficiency. It is built around surplus HK-54s that were purchased for two dollars each, so the total cost is far below that for a tetrode amplifier of similar power level using new tubes.

Much of the "low-drive" advantage of tetrodes fades when they are used at frequencies near the maximum at which they are capable of operating with reasonable efficiency. A 9903 or an 829-B

is customarily used to drive high-powered tetrode amplifiers on 144 Mc., and this triode amplifier will get along nicely with the same. The 9903 driver here runs at 105 watts input (700 volts at 150 ma.) and this furnishes 50 ma. grid current and 270 volts bias. The final stage will operate satisfactorily with grid current as low as 35 ma., so an 829-B should handle the job without exceeding its normal c.w. ratings.

## Design Considerations

In laying out a high-powered amplifier that requires conventional cross-over neutralization, symmetry and short leads are mandatory. The top-view photograph shows how these ends are

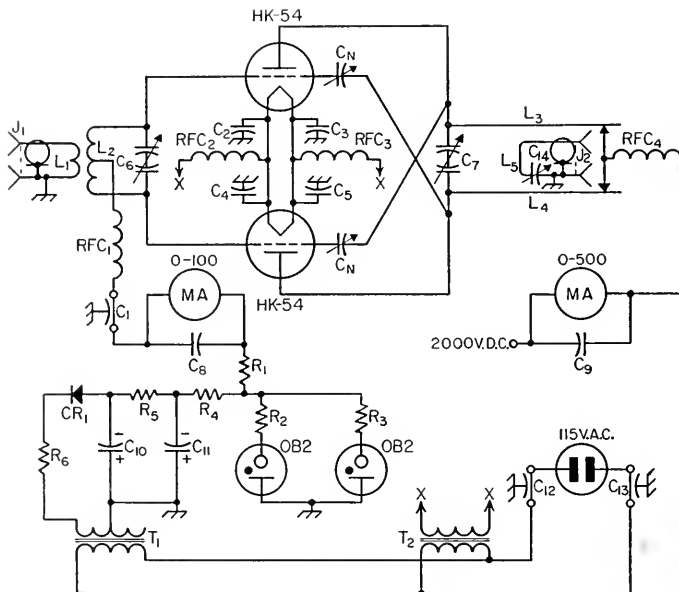


Fig. 1 — Schematic diagram of the 500-watt 2-meter amplifier.

- C<sub>1</sub> — 500-μf. feed-through type.
- C<sub>2</sub>, C<sub>3</sub>, C<sub>4</sub>, C<sub>5</sub> — 1000-μf. button by-pass.
- C<sub>6</sub> — National VHF-1S with two inside stator and rotor plates removed from each section.
- C<sub>7</sub> — National TMK-35D, all plates removed except two stator and one rotor, spaced evenly in center of each section.
- C<sub>8</sub>, C<sub>9</sub> — 0.01-μf. mica.
- C<sub>10</sub>, C<sub>11</sub> — 20-μf. 150-volt electrolytic.
- C<sub>12</sub>, C<sub>13</sub> — 0.1-μf. 600-volt (Sprague 80P3).
- C<sub>14</sub> — 15-μf. variable, double spaced (Bud LC-1641).
- C<sub>N</sub> — Disk-type neutralizing capacitor (National NC-800A).
- R<sub>1</sub> — 3500 ohms, 10 watts.
- R<sub>2</sub>, R<sub>3</sub> — 56 ohms, 1 watt.
- R<sub>4</sub> — 4700 ohms, 2 watts.
- R<sub>5</sub> — 270 ohms, 2 watts.
- R<sub>6</sub> — 25 ohms, 2 watts.

- L<sub>1</sub> — 1 turn No. 12 plastic-covered housewire. Loop inside L<sub>2</sub>.
- L<sub>2</sub> — 2 turns 3/16-inch copper tubing, 3/8-inch i.d. Turns 1/8 inch apart.
- L<sub>3</sub>, L<sub>4</sub> — 3/8-inch brass tubing, 10 1/2 inches long, spaced 1 3/8 inches, center to center.
- L<sub>5</sub> — 3/16-inch copper tubing bent into a U 3 3/4 inches long and 1 3/8 inches wide.
- J<sub>1</sub>, J<sub>2</sub> — Coaxial fitting, female (Amphenol 83-1R).
- RFC<sub>1</sub>, RFC<sub>4</sub> — 24 turns No. 28 on 1/2-inch polystyrene rod, or Ohmite Z-144.
- RFC<sub>2</sub>, RFC<sub>3</sub> — 5 turns No. 12 plastic housewire, 3/8-inch diam., close-wound.
- CR<sub>1</sub> — Selenium rectifier (Federal 403D2625).
- T<sub>1</sub> — Bias supply transformer, 150 v., 25 ma. (Merit P-3046).
- T<sub>2</sub> — 5-volt 10-amp. filament transformer (Stancor P-6135).

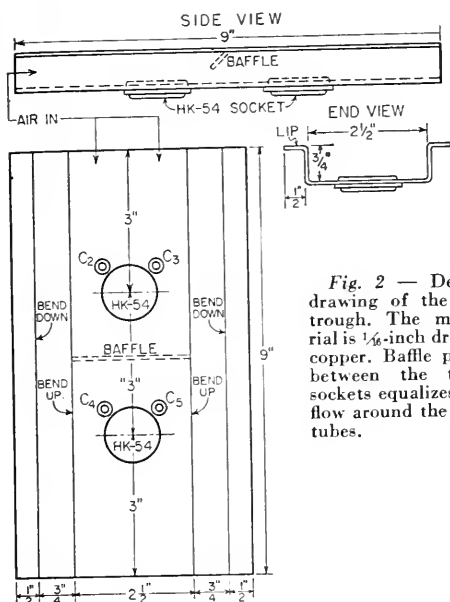


Fig. 2 — Detail drawing of the air trough. The material is  $\frac{1}{16}$ -inch drawn copper. Baffle plate between the tube sockets equalizes air flow around the two tubes.

served. Standard components were used wherever possible, the only handmade items being the grid coil, the plate line, and the blower trough. The last item doubles as a submount for the tube sockets and furnishes a low-inductance return for the filament by-passes.

Considerable time was spent experimenting with various filament by-pass arrangements, with the result as shown in the view of the blower trough and the filament wiring. Silver-mica button by-passes were mounted close to each filament pin, and the leads to the filament transformer were wound up into r.f. chokes. Using a grid-dip meter as an r.f. indicator, very little r.f. can be found in the filament circuit, and achieving this end helped considerably with the grid-drive problem. With ineffective filament by-passing the final stage was harder to drive; that is, more driver output was needed for a given final stage grid current.

Similar thought was given to plate by-passing. Checks on all available high-voltage by-passes showed series resonance at 30 to

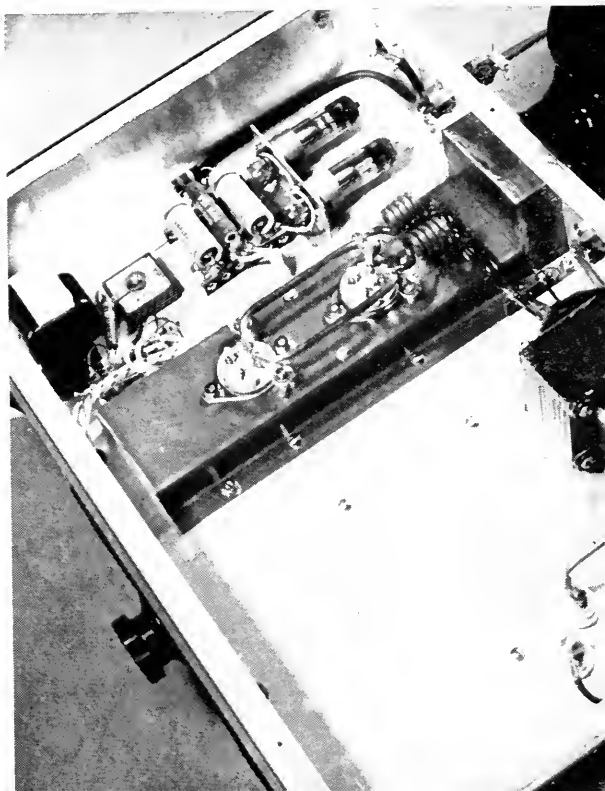
60 Mc., so their effectiveness at 144 Mc. is rather doubtful. The amplifier is operated without apparent r.f. return in the plate circuit, as the rotor of the tank capacitor is floating and there is an r.f. choke at the mid-point of the plate line. This is a satisfactory arrangement with push-pull amplifiers and  $RFC_4$  does an adequate job of keeping r.f. energy out of the power leads.

### Mechanical Work

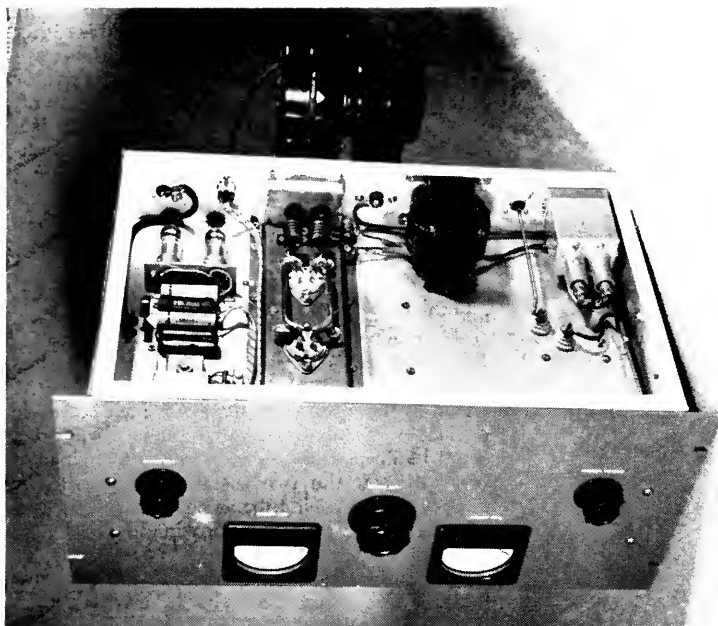
Details of the parts of the amplifier that must be made are best explained by the drawings and photographs. It will be seen that the cooling fan is mounted on the rear wall of the chassis. Its flow of air is directed around the tube bases by the copper trough, Fig. 2, the opposite end of which is closed off. Eight quarter-inch holes are drilled in the chassis around each tube, and a small baffle plate is inserted in the trough midway between the two sockets to equalize the flow of air to each tube. The fan is a Dayton type 1C180, supplying approximately 50 cubic feet per minute.

In making the plate tank circuit no soldering is done. The entire assembly is bolted together, and all components are silver-plated. The line is somewhat longer than necessary, and a shorting bar is provided so that its electrical length can be adjusted. Details of the shorting bar, the supports for the end of the line, and the contact straps that connect to the tuning capacitor are given in Fig. 3 (page 116).

The brass end fittings are mounted on ceramic stand-offs  $3\frac{1}{2}$  inches high (Millen 31004). The output coupling link is supported on 3-inch lengths of polystyrene rod,  $\frac{5}{8}$  inch in diameter. Tank capacitor supports are 3-inch ceramic standoffs. The neutralizing capacitors are held  $\frac{3}{4}$



Close-up view of the air trough and filament-circuit components.



Looking under the chassis of the W7JIP 500-watt rig. Bias-supply components are at the left. The copper trough controls air flow and provides a low-inductance return for filament by-passing.

inch above the chassis on ceramic cone insulators. The chassis is 11 by 17 by 3 inches.

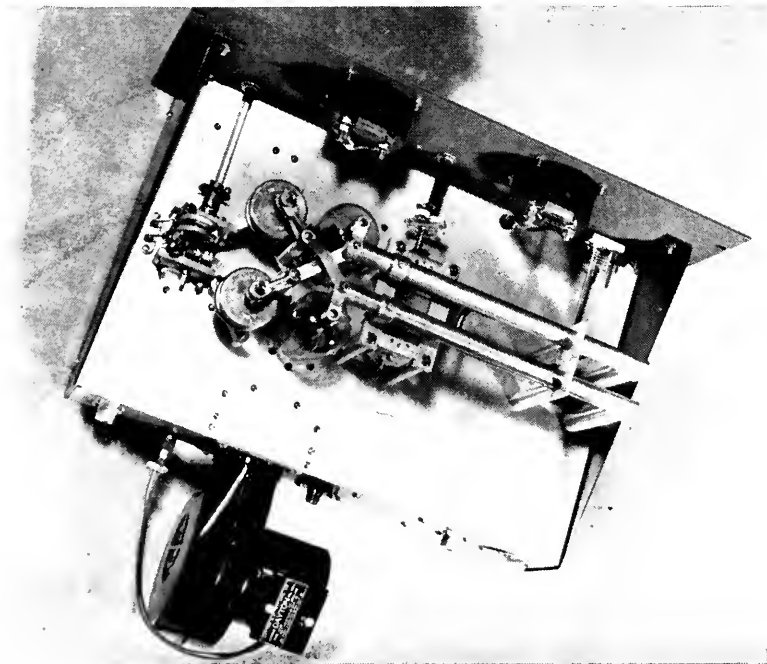
#### Operation

Neutralization of the amplifier is completely conventional, following procedure used on lower frequencies. It was found simpler to neutralize the rig when the lead from the high-voltage power supply was disconnected completely. Otherwise, self-rectification takes place in the tubes when grid drive is applied, and plate current will flow

in the final due to the d.c. return path through the power supply.

All the customary checks on neutralizing apply. If the layout is symmetrical, the gap in the neutralizing capacitors will be the same. Grid current dip, when the plate is tuned to resonance, will be one milliamperere or less. With plate voltage applied, plate and grid current will drop to zero if drive is removed, regardless of the setting of the grid or plate tuning capacitors. In operating

*(Continued on page 116)*



Top view of the 144-Mc. amplifier. Note complete symmetry, so important in achieving electrical balance and high efficiency at this frequency.

# A Miniature Mobile Antenna

*Using the B.C. Whip for Ham Work*

BY ROBERT J. BONEBRAKE,\* W9GCCQ

THE reason often given for using an arrangement such as the one about to be described — “The XYL won’t allow holes drilled in the car” — would probably be sufficient in this case also. However, in this instance there were additional considerations. Originally, a permanent mobile rig was not installed in the family automobile because we contemplated buying a new one in the not-too-distant future. A few months ago we were building a small self-contained all-band battery- or a.c./d.c.-powered receiver and transmitter for portable use. Having always had the desire to operate mobile, the idea was conceived that it should be possible to use the portable rig in the car, using either its self-contained batteries or an inverter to produce 115 volts a.c. from the 6-volt car battery. This would make possible the use of the small rig as both a portable and mobile rig, except for one problem — what to use for a mobile antenna. Since the rig would not be in the car permanently, it did not seem worth while to mount a permanent center- or base-loaded antenna on the car. Yet to get any power into the antenna it must be resonant, and

\* 3027 Memphis Street, El Paso, Texas.

• If there are objections to the mounting of the conventional 8-ft. transmitting antenna on the family car, W9GCCQ tells here how to make use of the standard b.c. antenna for mobile operation.

the ordinary auto antenna is not long enough to resonate at any frequency lower than the 50-Mc. band.

Thus it was decided to use the existing auto antenna, fully collapsed, as the bottom section of a center-loaded whip. The rest of the antenna consists of a center insulated section on which are mounted banana jacks for plug-in loading coils, and a top section made of a standard auto antenna. The center section is connected to the top and bottom antenna sections by two  $\frac{5}{16}$ - to  $\frac{1}{4}$ -inch copper-tubing reducer fittings. Thus the center insulated section and the top section can be quickly attached to or removed from the car antenna.

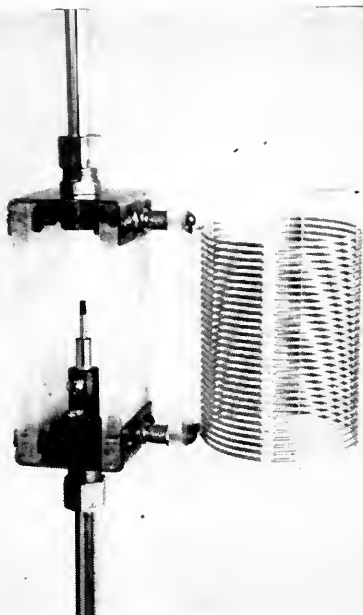
It might be pointed out at this time that in any mobile installation where it is desired to use the existing auto antenna on the converter, this loading-coil arrangement can be used to advantage. On 40 meters and 20 meters, signals which are unreadable using the standard auto antenna become S9-plus when the extension is attached and the proper loading coil plugged in. In our case, since the portable transmitter has a very low-power output, separate loading coils were made for each band in the interest of highest possible efficiency. However, if the antenna were to be used only for receiving, the coil could be made sufficiently large for use on the lowest-frequency band to be used, and tapped down for the higher-frequency bands.

## Construction

The construction of the center insulated section is shown in the drawing and photographs. It was made entirely from readily available parts, since



The miniature mobile antenna with the loading coil in place.



The center loading section connected to the b.c. antenna, with the 40-meter coil in place. At the risk of somewhat lower efficiency, this single coil could be tapped for use on the higher-frequency bands.

we did not have tools or materials to do any machining of connectors, tapping of polystyrene, etc. Undoubtedly, anyone with proper equipment could produce a better center section from a mechanical standpoint.

The bottom section of ordinary automobile antennas is approximately  $\frac{5}{16}$ -inch in diameter, and makes a fairly close fit into the  $\frac{5}{16}$ -inch end of the reducer fitting. The outside diameter of the  $\frac{1}{4}$ -inch end of the fittings is smaller, thus providing a larger shoulder to bear against the end plate when the retaining nut is tightened.

In normal use of the copper-tubing fittings, the nut is tightened until the copper compression ring is compressed tightly against the tubing, thus producing a leakproof seal. In our application, the ring cannot be compressed enough because the antenna tubing is slightly smaller than ordinary  $\frac{3}{16}$ -inch copper tubing. Even if it could be,

it would be impossible to remove it easily when taking the extension piece from the car antenna. Therefore, since the joint does not have to be leakproof, the compression rings can be split lengthwise on one side with a hacksaw. Then, when the nut is tightened, the ring can compress around the antenna, closing the slot made with the hacksaw, and clamping tightly to the antenna. The copper compression rings should not be used in the ends of the reducer fittings that fasten permanently to the end plates.

To provide more rigidity where the insulated center section clamps to the bottom antenna section, a 1/4-inch brass shaft coupling is soldered or brazed to the nut on the 1/4-inch side of the bottom reducer fitting. When connecting the insulated section to the auto antenna, the center section of the auto antenna is allowed to extend up through the shaft coupling, and the set screws are tightened down on it.

The side pieces are made from  $\frac{1}{4}$ -inch polystyrene. Polystyrene makes a good insulator at radio frequencies, but it has a tendency to discolor when exposed to sunlight for long periods of time, and also may crack when subjected to high pressures. Therefore, it is suggested that other types of insulating materials may be better for this application. However, we have used this antenna for several months and no serious ill effects have been noted. We have found that if the polystyrene is heated slightly at the points where pressure is applied to it, the cracking will be minimized. For example, after the polystyrene pieces have been bolted to the end plates, the bolts can be heated slightly with a soldering iron. Too much heat, of course, will cause excessive melting of the polystyrene.

The end plates on which the reducer fittings are mounted are made of 16-gauge cadmium-plated sheet metal. Sheet brass, if available, would be better due to its increased conductivity and resistance to corrosion. If the dimensions given in the drawing are followed, the unit must be assembled in the following sequence after all holes have been drilled: First, solder the banana jacks to the end plates and bolt the polystyrene to that side of each plate. Then put the reducer fittings on and bolt the other piece of polystyrene in.

The top section of the antenna is a standard

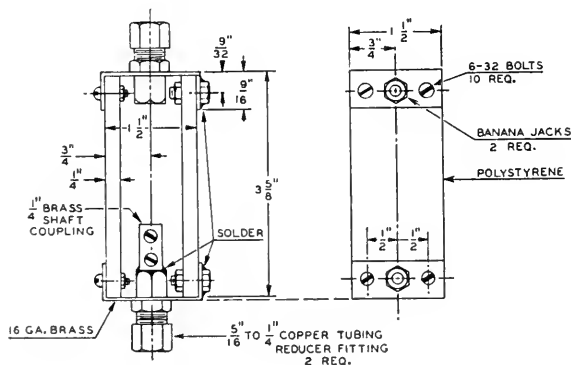
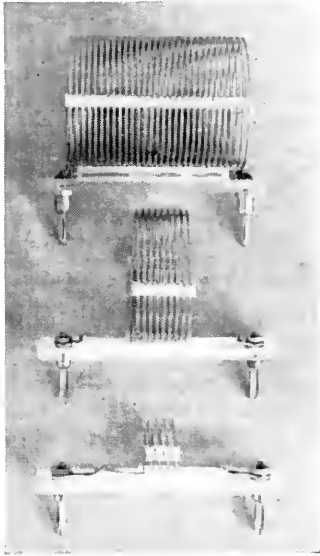


Fig. 1 — Sketch showing details of the loading-coil plug-in mounting.

64-inch 3-section telescoping side-cowl-mounting type auto antenna, available at most auto parts stores.

Loading Coils

To date, we have made loading coils for 40, 20, and 10 meters. (A small coil is necessary for 10 because the total length of the antenna is not quite  $\frac{1}{4}$  wavelength.) The coils are made from B & W inductors, as shown in the table. After determining the proper number of turns for each coil, the coil was cut and mounted on a  $3\frac{3}{4} \times \frac{3}{4}$ -inch piece of  $\frac{3}{16}$ -inch polystyrene, using Polyweld 912 coil dope, and banana plugs. The type of construction can be seen in the photographs. The coils were adjusted by starting with too much inductance, and decreasing the size one turn at a time, tapping the coil with a small alligator clip. Indication of the proper inductance was obtained by observing the S meter of a receiver each time the tap was changed. The receiver was located



The loading coils are mounted on polystyrene strips fitted with banana plugs.

about 100 feet away, with the antenna terminals grounded. The size of the coils given in the table should be fairly accurate for any installation, provided the length of the two antenna sections is the same as ours — 64 inches above the coil, and 20 inches below. The length of antenna above the coil has the most effect on the required inductance, longer lengths requiring less inductance. The antenna in our installation is fed through  $5\frac{1}{2}$  feet of coaxial cable by a link on the final tank coil. The cable consists of the regular auto antenna lead-in, plus a 3-foot extension made of RG-59/U.

Results

The over-all efficiency of the antenna seems to be quite good. Two-way checks have been made with a fixed station using a nondirectional an-

COIL TABLE		
Band	B & W Type	Turns
40	3907-1	30
20	3907-1	6
10	3010	4

Type 3907-1 is 2-inch diam., 10 turns per inch, No. 16.  
Type 3010 is  $\frac{3}{4}$ -inch diam., 8 turns per inch, No. 18.

tenna, and distances of 4 miles have been covered using  $\frac{1}{2}$ -watt input to the final amplifier in the mobile rig.

Although it may seem that the added weight of the loading coil and antenna extension might cause undue strain on the auto antenna and its mount, we have used this arrangement for several months with no apparent damage. Since it takes but a matter of seconds to remove the extension from the auto antenna, or to telescope the top section down, it can easily be lowered when putting the car in a low garage or driving through low wooded areas. For even greater flexibility, if desired, the top extension could be connected to the center insulated section by means of a flexible mounting spring, similar to the type that is now on the market for that purpose.



September 1930

... Mr. Warner's editorial is centered around the idea that in spite of the passing of some phases of radio pioneering, the amateur has not lessened his value to the art but has risen to the position of a solid and respected settler within the communications field.

... Successful 'phone work on 5 meters is the keynote of "Making Practical Use of the 56-Mc. Band," by J. J. Long, W8ABX.

... Rockbounders with a desire to move around a little can enlighten themselves with "QSY with Crystal Control," by Boyd Phelps, W2BP/W9BP.

... "On to Richmond!" is the cry of the Virginia Section of the Roanoke Division as they prepare for their first convention which will be held this month.

... "Experiments with Dynatron Oscillators," by O. P. Susmeyan, W1BLH, gives the inside story on how they work and their application to amateur apparatus. To illustrate one use, a heterodyne frequency meter using a negative-resistance tube as an oscillator is described.

... A receiver featuring push-pull r.f. and detector stages is included in this month's "Experimenters' Section."

... W1SZ and W1MK have been indulging in morning activity with Australian stations. Fine relaying has been rendered by YS1X (a ship plying between New York and Chile), VK5HG and VK5GR in this enterprise. Also, a regular schedule has been maintained with VK2EK.

... W9BAN, George P. Taylor operator, is station of the month. This station's transmitter is designed for 40-meter operation exclusively with a pair of Type '10s in a push-pull oscillator circuit. The receiver is patterned after a QST description. It uses a screen-grid antenna coupling tube, a regenerative triode detector, and two stages of transformer-coupled audio.

# Simple Single-Band Preamplifiers

*More Gain for the Receiver*

BY W. W. DEANE, \* W6RET

• The author found that this little fixed-tuned preamplifier helped a lot in pulling in State-side signals on his 75A-1 while he was in the South Pacific. It can be duplicated with a handful of parts and a couple of spare hours.

**O**CCASIONALLY we all wish we could get a little more gain out of the receiver, particularly one not employing an r.f. stage. A very satisfactory way to improve the gain is to add an r.f. preamplifier ahead of the receiver. The ultimate, of course, would be a bandswitching unit to cover all bands. However, the majority of hams seem to confine their operations to one or two bands, and the cost and complexity of constructing a switchable unit makes it desirable to utilize a simple preamplifier confined to a single band. Fig. 1 illustrates a preamplifier for any one band from 80 to 10 meters. It requires a minimum of parts, expenditure, or labor, and will pay big dividends in bringing in a lot of heretofore unheard signals.

## Construction

In the model illustrated, a 6AK5 tube was used, but there are several different tubes that could be substituted, such as the 6AG5, 6CB6, 6BC5, 6BH6, or 6AU6. It should be noted that all of the above tubes are not direct replacements for the 6AK5, and a tube manual should be consulted

\* 4524 Fountain Ave., Los Angeles, Calif.

for proper pin connections.

The unit is constructed in a  $2\frac{1}{4} \times 1\frac{1}{2} \times 1\frac{3}{8}$ -inch Minibox. Provisions are made to switch the preamplifier in or out of the circuit with a d.p.d.t. slide switch. A phono jack is placed at either end of the box for the antenna input, and the output to the receiver. All coils are wound on  $\frac{3}{8}$ -inch Cambridge LS-3 type coil forms which have iron slugs. A small shield may be placed

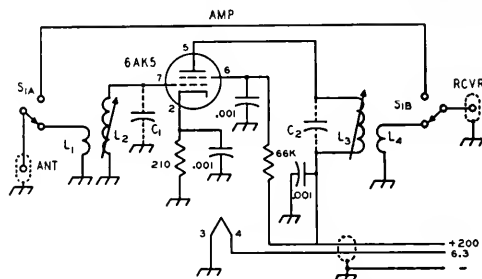


Fig. 1—Circuit of the miniature preamplifier. All 0.001- $\mu$ f. capacitors are disk ceramic.  $C_1$  and  $C_2$ , when used, are 20- $\mu$ f. low temp. mica or ceramic (see table).

across the tube socket to eliminate any interaction between the grid and plate coils. In the model illustrated the shield has been removed to allow better presentation of the parts lay-out.

A power source of 150 to 200 volts d.c. at 10 ma. and 6.3 volts at 0.3 amperes is required to

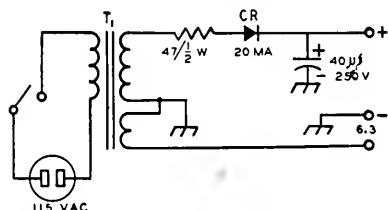


Fig. 2—Circuit of a simple power supply for the miniature preamplifier.  $T_1$  is a small TV booster transformer delivering 125 volts at 15 ma., and 6.3 volts at 0.6 amp. (Stancor PS8415)

operate the unit. This can normally be taken from the receiver, except in cases where the tube filaments are wired in series to operate directly from 115 volts. In the latter case, a small power supply, similar to Fig. 2, may be constructed. If the d.c. voltage is in excess of 200 v., a resistor should be placed in series with the B-plus lead.

## Alignment

After the unit has been assembled and wired, the coils may first be set to approximate fre-

(Continued on page 118)



A simple preamplifier built in a small Minibox. The two slug-tuned coils and tube are at the rear, with the slide switch in front.



# 807s in a 150-Watt Bandswitching Rig

*Operating Convenience with Medium Power*

BY GEORGE G. SYMES, JR.,\* W3WXP/Ø

• This 150-watt transmitter has a number of attractive features. Provision is made for both crystal and VFO operation. The VFO and multiplier stages are gang-tuned, and a multiband tuner requiring no switching is used in the parallel 807 final. Other features include a metering system, excitation control, and a built-in power supply for the driver stages. The only external unit required is the power supply for the final.

Not long ago, after a shutdown of some 12 years, I moved into quarters that permitted resumption of ham activities. The old 6L6-807 band-switching rig, quite modern when it was built 15 years ago, was dusted off, fired up and put on the air. After replacing a few small parts (casualties of a 5-year storage in sea air), and refreshing my memory on its peculiarities, it gave a good account of itself. However, passage of time showed up two serious drawbacks. The yield of QSOs in proportion to the number of calls using crystal control was very disappointing, and TVI restricted operation to almost impossible hours.

The quickest solution seemed at first to lie in an alteration of the old rig. But the more I thought about adding an external VFO, fitting shielding, installing by-passes, v.h.f. filters and shielded wiring in already restricted space, the more it seemed desirable to rebuild completely so that many ideas accumulated over later years could be included. Consequently, the rig shown in the photographs was born.

The circuit, shown in Fig. 1, is a result of browsing through the ARRL *Handbook* and issues of *QST* for the last few years. Either a 6AG7

\*% A. G. T. Eng. Dept., Personnel and Planning Sec., Westinghouse Elec. Corp., Kansas City, Mo.

The 150-watt band-switching transmitter and its high-voltage supply. The standard rack panel is 8¾ inches high (see text). Grouped to the left are  $MA_2$ ,  $S_5$  (see text), the National AM dial for  $C_{16}$ , and controls for  $C_{17}$  and  $S_3$ . Below the National ACN dial for the exciter gang are controls for  $R_1$ ,  $S_2$ , and  $S_1$ . To the right are  $MA_1$ ,  $S_4$ , and the two low-voltage power-supply switches.

Clapp VFO covering 1.6 to 2 Mc. (to include the 11-meter band), or an 80-meter Pierce crystal oscillator may be switched ( $S_{1A}$ ) to feed a 6AG7 buffer doubler followed by a string of 6AQ5 frequency multipliers covering 80 through 10 meters. Each stage (excepting the one covering 14 and 21 Mc.) covers only one band and therefore is more easily stabilized and adjusted for optimum performance than a stage required to cover several bands.  $S_{1B}$  and  $S_{1C}$  remove screen and plate voltages from the idle oscillator. These voltages are held constant by VR tubes in the low-voltage power supply included in the assembly.

The output of any multiplier stage may be switched ( $S_{2A}$ — $S_{2D}$ ) to feed a final using a pair of 807s in parallel. (6146s could be substituted with a saving in space, although some details might have to be altered.)  $S_{2E}$  removes plate and screen voltages from the idle multiplier stages. The multiplier stages are tuned simultaneously with the VFO by ganging their tuning capacitors ( $C_{1A}$ — $C_{1E}$ ) to the VFO frequency control. Thus, the tuning controls are reduced to three, including the output coupling control.

The 6AG7 amplifier-doubler doubles frequency only when working from the 1.6–2-Mc. VFO. Crystals in the 3.5-Mc. region are used in the crystal oscillator, although 160-meter crystals may be used if they are on hand. The 6AQ5 doubler-tripler is shifted from 14 to 21 Mc. by switching  $L_5$  in parallel with the 14-Mc. inductor,  $L_4$ , thus reducing the effective inductance for the higher-frequency band.

$C_2$ ,  $C_6$ ,  $C_8$ ,  $C_{10}$ ,  $C_{12}$ , and the adjustable slugs in the multiplier plate inductors provide convenience in adjusting the tracking of the multiplier circuits.  $C_7$ ,  $C_9$  and  $C_{11}$  are included so that the circuit capacitances will remain the same whether a multiplier stage is working into the final amplifier or into the following multiplier



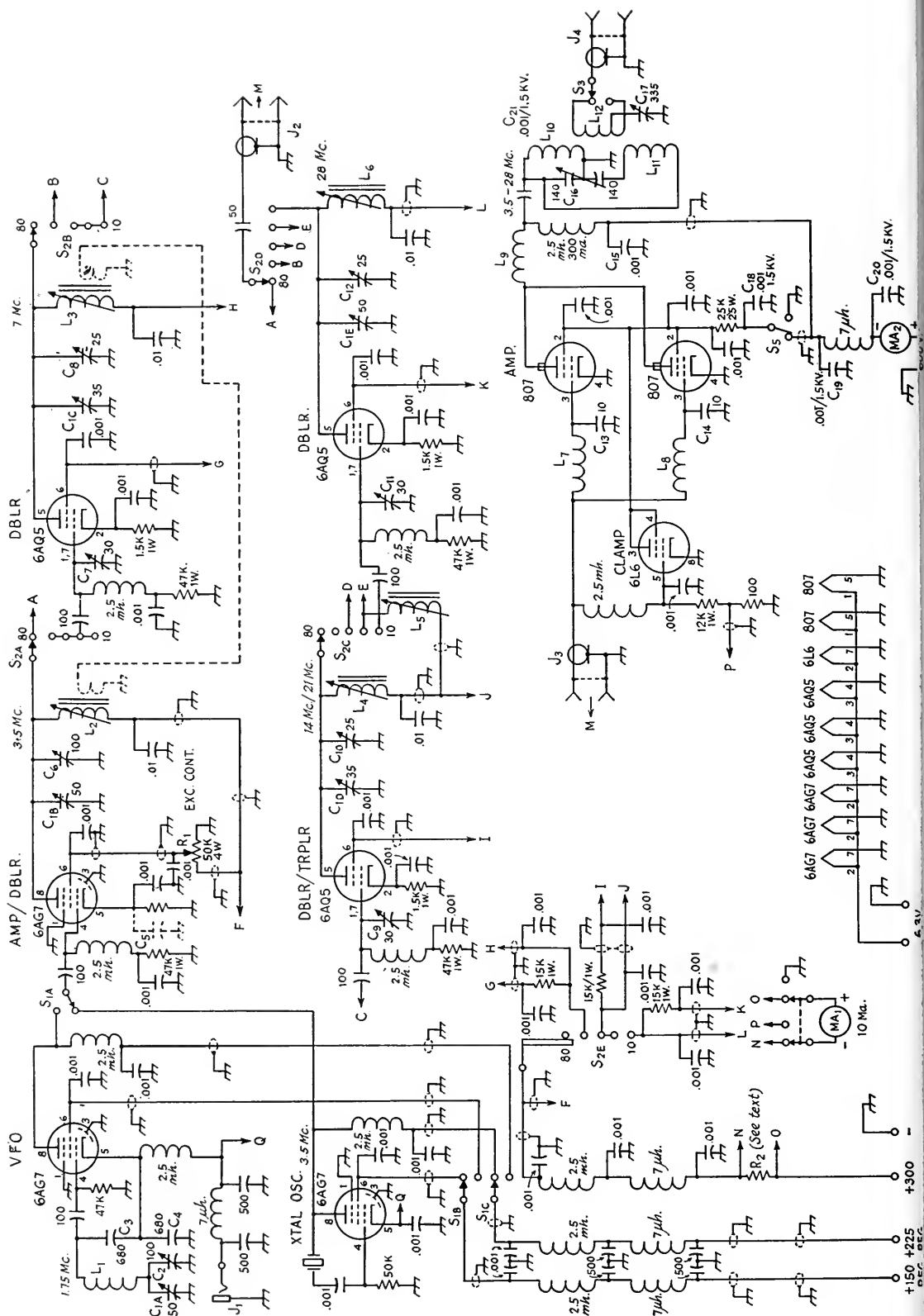


Fig. 1—Schematic of W3WXP's 150-watt band-switching transmitter.

- C<sub>1</sub>, C<sub>5</sub> — See text.  
 C<sub>2</sub>, C<sub>6</sub>, C<sub>7</sub>, C<sub>8</sub>, C<sub>9</sub>, C<sub>10</sub>, C<sub>11</sub>, C<sub>12</sub> — Midget air trimmers (Johnson type J, Hammarlund type HF, Bud LC-2000 series, etc.)  
 C<sub>3</sub>, C<sub>4</sub>, C<sub>13</sub>, C<sub>14</sub> — Silver mica.  
 C<sub>15</sub>, C<sub>18</sub>, C<sub>19</sub>, C<sub>20</sub> — 1600-volt disk ceramic (Erie 1R5KV, etc.)  
 C<sub>16</sub> — Dual variable, plate spacing 0.03 inch minimum (Bud CE-2046).  
 C<sub>17</sub> — Midget variable (Bud MC-1860, Hammarlund MC-325-M, Johnson 14OR12, etc.).

All other capacitors disk ceramic.

Note: 6AG7 buffer cathode resistor — 1.5K, 1W.

J<sub>1</sub> — Open-circuit 'phone jack.

J<sub>2</sub>, J<sub>3</sub> — Shielded phono<sup>1</sup> type jack.

J<sub>4</sub> — Coaxial connector.

S<sub>1</sub> — 3 p.d.t. rotary (Centralab 2507, Mallory 174C, etc.).

S<sub>2</sub> — 5-wafer 5-position ceramic rotary switch (Centralab P-123 index assembly, 4 type X wafers [A, B, C, D]; 1 type P1S wafer [E]).

S<sub>3</sub>, S<sub>5</sub> — S.p.s.t. rotary.

S<sub>4</sub> — D.p.d.t. rotary.

Unless otherwise specified, all resistors  $\frac{1}{2}$  watt.  
 All 7- $\mu$ h. v.h.f. chokes Ohmite Z-50.

stage. This is necessary to preserve tracking.<sup>1</sup> The potentiometer  $R_1$  in the screen circuit of the 6AG7 buffer-doubler is used to adjust excitation and is a convenience no rig should be without.

When the rig was first fired up, the 6AG7 buffer-doubler oscillated. This instability was eliminated by connecting a second by-pass,  $C_6$ , shown in dotted lines, at the cathode, and experimentally grounding it at various points on the chassis until the right spot was found. Slight differences in wiring or layout may make this unnecessary. Another oscillation showed up in the 40-meter 6AQ5 stage. This was cured by a 1-turn neutralizing link, also shown in dotted lines. This link may or may not be required in every case.

<sup>1</sup> At 10 meters, the reactance of the parasitic chokes used (1  $\mu$ h.) becomes appreciable relative to the reactance of  $C_{13}$  and  $C_{14}$  plus the tube input capacitance. This tends to increase considerably the apparent capacitance across the circuit, and this is probably the reason that the 50- $\mu$ mf. variable capacitor was found necessary to cover the 10-meter band. It should be possible to eliminate v.h.f. parasitic oscillation without the use of the grid chokes (see recent editions of *The Radio Amateur's Handbook*). With the chokes removed, capacitor values the same as those used in the 40- and 20-meter stages should be adequate with an appropriate increase in tank inductance. — Ed.

<sup>2</sup> See QST, July, 1954.

<sup>3</sup> It is advisable to use a rotary switch at this point, since the switch must stand the full 807 plate voltage. — Ed.

To avoid switching in the final amplifier, a multiband tuner<sup>2</sup> is used in the output tank circuit.  $S_3$  selects a proper proportion of the output coupling inductor,  $L_{12}$ , depending on the output frequency.  $C_{17}$  is the output coupling control.  $L_7$ ,  $L_8$ ,  $L_9$ ,  $C_{13}$  and  $C_{14}$  were installed to suppress parasitic oscillation. The two capacitors are also an aid in reducing TVI. The 807s are protected by a 6L6 screen clamper.  $S_5$ <sup>3</sup> grounds the screens while tuning up the exciter.

Two milliammeters are included. A 10-ma. unit,  $MA_1$ , may be switched to read either final grid current or total exciter current. The resistor  $R_2$  is a 20-times shunt to increase the full-scale reading to 200 ma. The shunt was made from copper wire as described in the measurements chapter of the ARRL *Handbook*. The second meter, a 300-ma. unit, reads combined plate and screen currents to the 807s.

All power leads are of shielded wire, and have filters for the operating frequency as well as for v.h.f. The low-frequency filtering may not be strictly necessary, but it does help to keep fundamental r.f. out of the power supply and off the a.c. line where rectification might take place, resulting in the generation of TVI.

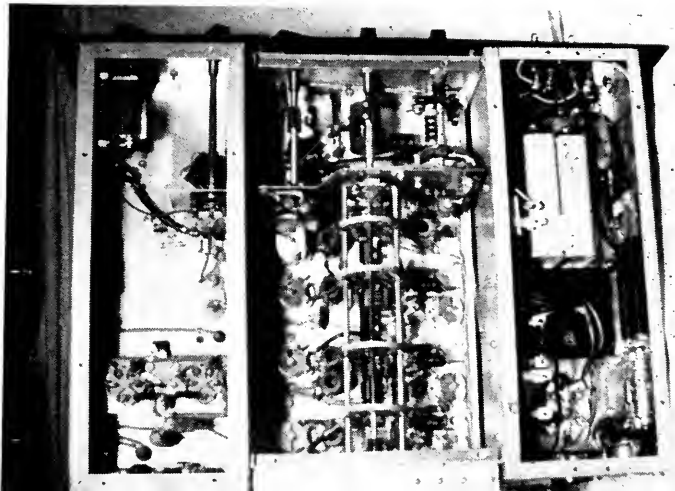
### Construction

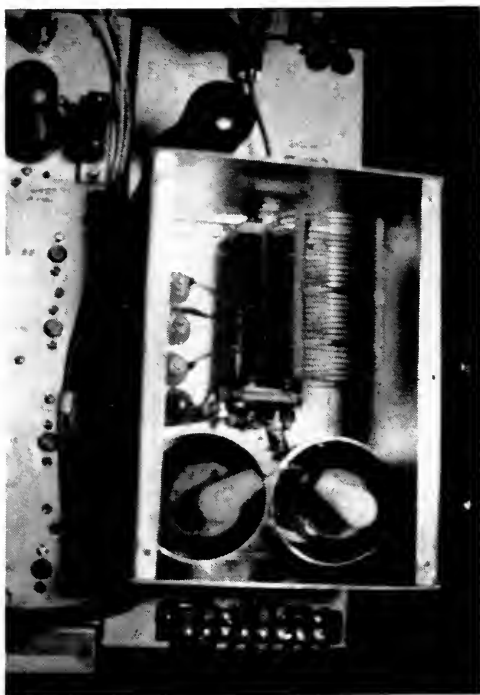
A system of permanent yet flexible construction was found in building the exciter, final amplifier and low-voltage power supply as separate units. Any of these may be quickly removed from the assembly for replacement, rebuilding or use elsewhere. A pair of 5  $\times$  13  $\times$  3-inch chassis takes care of the low-voltage power supply and the final amplifier. The exciter is assembled in a 12  $\times$  7  $\times$  4-inch ICA "Flexi-mount" box.

In the exciter unit, the VFO occupies the front end, with the tuning capacitor  $C_{1A}$  enclosed in an aluminum box on top, and the inductor  $L_1$  mounted underneath on a small stand-off insulator fastened against the front wall. In the rear/top view, the crystal and crystal-oscillator tube are to the right of the tuning-capacitor box, and the VFO tube is to the left, followed by the string of multiplier tubes. The 10-meter stage is at the rear of the chassis.

Underneath, the four remaining units of the tuning gang,  $C_{1B}$ - $C_{1C}$ , are lined up at the center of the chassis. They are driven by a brass gear

Bottom view showing components underneath the three chassis. In the exciter chassis at the center, the low-frequency circuits are toward the panel and the 10-meter circuit is at the rear of the chassis. Coils and trimmer capacitors are in groups around the associated bandswitch wafer.





Looking down into the final-amplifier box. The amplifier tubes are submounted. Also shown is the 6L6 clamper tube.

attached to the tail shaft of the VFO tuning capacitor,  $C_{1A}$  above, and another gear on the shaft of the first multiplier tuning capacitor,  $C_{1B}$ , below. The gears engage through a slot cut in the chassis. (I may say that this arrangement is not as satisfactory as it might be and if I were going to do the job again, I would mount the entire gang on top of the chassis, cover it with a long narrow box of aluminum, and feed the stator leads through holes to the switch sections below.)

The bandswitch, with the wafers spaced approximately according to the tube spacing, is mounted between a partition that shields the VFO from the rest of the exciter, and the rear wall of the box. The last wafer,  $S_{2E}$ , is mounted on the outside of the box. The partition shielding the VFO also serves as a mounting for the crystal-VFO switch,  $S_1$ , and the excitation control,  $R_1$ .

In the bottom view, the inductors for the multiplier stages and the padder capacitors,  $C_6$ ,  $C_8$ ,  $C_{10}$  and  $C_{12}$ , are to the right of the band-switch. The tube sockets and the grid trimmer capacitors,  $C_7$ ,  $C_9$ , and  $C_{11}$ , are to the left. The VFO trimmer,  $C_2$ , is to the right, close to the front wall of the chassis. (Its control shaft is behind the crystal-oscillator tube in the rear view.)

A 1-inch extension of aluminum is attached to the rear of the exciter box to make its over-all length 13 inches to match the adjacent chassis. The r.f. filter components and the 6AQ5 screen

resistors (as well as the last section of the band-switch,  $S_{2E}$ ), are placed inside the enclosure, and the compartment is fitted with a cover plate of aluminum. A terminal strip is set in the upper edge.

### Capacitor Gang

In building this unit, I made use of components on hand whenever possible. The condenser gang,  $C_1$ , is made up of individual capacitors connected together with shaft couplers. Care must be used in selecting capacitors that will fit into the length of the "Flexi-mount" box. One inch must be allowed for the hub of the National ACN dial, leaving only 11 inches for the tuning gang. A suitable gang can be made up of Bud "Tiny-Mite" dual capacitors. A dual 25- $\mu\text{f}$ . unit (LC-1661) with its sections connected in parallel will serve for  $C_{1A}$ . A dual 50- $\mu\text{f}$ . unit (LC-1662) can be used for  $C_{1B}$  and  $C_{1C}$ . Five plates (3 rotor and 2 stator) should be removed from the  $C_{1C}$  section. Another dual 50- $\mu\text{f}$ . unit can be used for  $C_{1D}$  and  $C_{1E}$ , removing plates, as above, for  $C_{1D}$ .

### Amplifier

The amplifier is enclosed in a homemade aluminum box fastened to the top of the 5  $\times$  13  $\times$  3-inch chassis. The box is 4½ inches high (limited by the height of the 8¾-inch panel), the same width as the chassis, and long enough to include the 807s and the multi-band tank-circuit components, yet leave sufficient room for the 6L6 clamper tube in front and a terminal strip at the rear. The sides and top are perforated to provide ventilation. The tuning capacitor  $C_{14}$  and the output inductors  $L_{10}$ ,  $L_{11}$  and  $L_{12}$ , are placed centrally in the box, and as far toward the front as possible. The capacitor is mounted directly on the front wall of the box, and rests against the chassis. In an effort to reduce the length of the path between the rotor of the capacitor and the 807 cathodes, short leads from each end of the rotor were brought through holes and fastened to the under side of the chassis. To allow room for the 300-ma. meter, which has a 2½-inch-diameter flange, the dial

#### Inductor Dimensions

- $L_1$  — 30 turns No. 30, close-wound.<sup>1</sup>
- $L_2$  — 35 turns No. 26, close-wound.<sup>2</sup>
- $L_3$  — 18 turns No. 26, ⅝ inch long.<sup>2</sup>
- $L_4$  — 8 turns No. 26, ½ inch long.<sup>2</sup>
- $L_5$  — 5 turns No. 26, ½ inch long.<sup>2</sup>
- $L_6$  — 3 turns No. 26, ¼ inch long.<sup>2</sup>
- $L_7, L_8$  — 1  $\mu\text{h}$ . (National R-33). See text.
- $L_9$  — 5 turns No. 14, ¼-inch diam., ⅝ inch long.
- $L_{10}$  — 12 turns No. 16, 2-inch diam., 1¼ inches long (B & W 3907 strip inductor).
- $L_{11}$  — 6 turns No. 14, 1¼-inch diam., ¾ inch long (see text).
- $L_{12}$  — 8 turns No. 16, 2-inch diam., ¾ inch long (B & W 3908 strip inductor).

<sup>1</sup> Wound on Millen or National 1-inch diam. phenolic form.

<sup>2</sup> Wound on National XR-50 iron-slug form, ⅝-inch diameter.

Fig. 2 — Circuit of the low-voltage power supply.

C<sub>1</sub>, C<sub>2</sub> — Mallory TC-92, C-D BRHV-710, Aerovox PRS, etc.

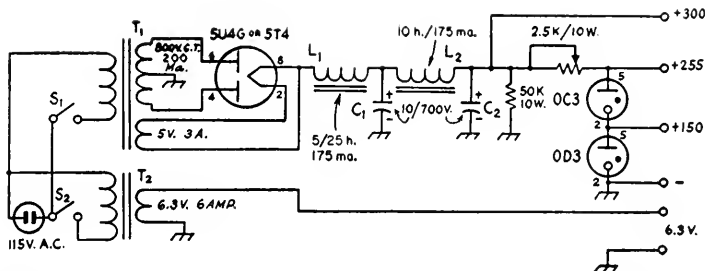
L<sub>1</sub> — UTC S-30.

L<sub>2</sub> — UTC S-29.

S<sub>1</sub>, S<sub>2</sub> — Toggle.

T<sub>1</sub> — UTC R-109.

T<sub>2</sub> — UTC FT-8.



must be set so low on an 8 $\frac{3}{4}$ -inch panel that it is necessary to use a flexible shaft between the dial and the tuning-capacitor shaft. With a 10 $\frac{3}{4}$ -inch panel this would not be a problem, of course.

Holes to clear the bases of the 807s are cut in the top of the chassis, and the sockets are sub-mounted, on a U-shaped strip of aluminum, to a depth that brings the caps of the 807s clear of the top cover of the box. Here again, a 10 $\frac{3}{4}$ -inch panel might provide greater freedom in the method of mounting. Millen shield cans are used with the tubes.

### Inductors

The inductors were originally all made from B & W 3907 strip inductor stock as shown in the top view, simply opening up the winding where necessary to provide the proper terminals. However, the high-frequency section, L<sub>11</sub>, ran warm enough to soften the plastic supporting strips. This difficulty was solved later by making L<sub>11</sub> a separate section, wound on a ceramic form. Similar forms may be hard to come by, but it should not be too difficult to make a self-supporting coil of the same inductance, since the dimensions are small. The output coupling inductor, L<sub>12</sub>, should be placed between L<sub>10</sub> and L<sub>11</sub>.

The output-link switch, S<sub>3</sub>, and the link tuning capacitor, C<sub>17</sub>, are mounted under the chassis, as shown in the bottom-view photograph.

Shielded phonograph jacks are mounted near the rear ends of the exciter and amplifier chassis

and are connected with a short length of RG-59/U coax fitted with phonograph plugs.

### Power Supply

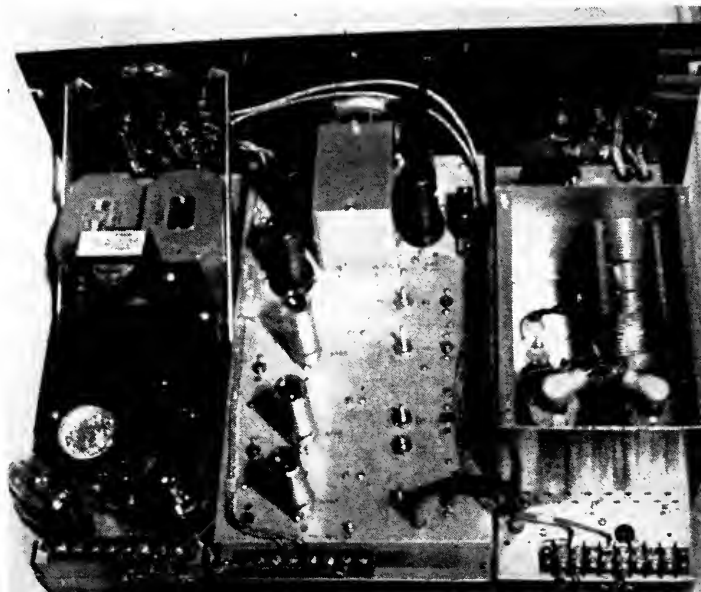
The low-voltage power supply is built on the second 5 × 13 × 3-inch chassis. The circuit is shown in Fig. 2. The arrangement of components is not critical so long as they are accommodated in the available space. This section includes the 10-ma. meter and its switch, indicator lights for filament and plate voltage, and a pair of toggle switches to control these supplies. The high-voltage supply is conventional, using choke input and a transformer rated at 600 or 750 v. d.c., 200 to 300 ma.

### Adjustment

After checking the crystal oscillator to make sure that it is functioning properly, the VFO should be checked and its tuning range adjusted to cover the desired range of frequencies. Setting C<sub>1</sub> to minimum capacitance, C<sub>2</sub> should be adjusted until the oscillator is heard at 4000 kc., or a few kc. higher. Then, with the bandswitch in the 80-meter position, and the milliammeter reading grid current to the 807s, C<sub>6</sub> should be set at midscale (C<sub>1</sub> still at minimum capacitance) and the slug in L<sub>2</sub> adjusted for maximum 807 grid current. Then C<sub>1</sub> should be adjusted until the oscillator signal is heard at 3200 kc., and C<sub>6</sub> readjusted for maximum grid current. If this last adjustment requires an increase in the capacitance of C<sub>6</sub>, the tuning range of the 80-

(Continued on page 120)

Rear view of the 150-watt transmitter, showing arrangement of components on top of the power-supply and exciter chassis (see text).



## • Technical Topics —

### Ripple on the S.S.B. 'Scope Pattern

IT is well known that a perfect single-tone single-sideband signal consists of but a single radio frequency. When such a signal is displayed on the face of a 'scope being swept horizontally at an audio-frequency rate, the pattern is a horizontal band having perfectly smooth and straight upper and lower edges. It is identical with the pattern of any unmodulated carrier.

If the suppression of the other sideband or the carrier is not complete, the edges of the pattern show a ripple. Assuming that the carrier is completely suppressed, the relationship between the desired and undesired side frequencies can be represented by the phasor<sup>1</sup> diagram shown in Fig. 1. *AB* represents the amplitude

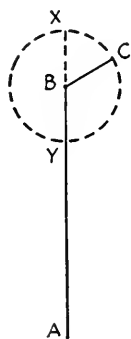


Fig. 1 — The mechanism by which the undesired side frequency makes a "ripple" on the desired side frequency of an s.s.b. signal. Other possible spurious components are neglected in this drawing, but can be included if their relative amplitudes, phases, and frequency separation from the desired side frequency are known.

of the desired side frequency and *BC* the amplitude of the undesired side frequency. The latter rotates with respect to *AB*, with *C* describing the dashed circle. The rate of rotation is equal to twice the audio modulation frequency since the two frequencies are separated in the spectrum by that number of cycles. At some instant during each such period of rotation point *C* will reach *X* and the total instantaneous amplitude will be the distance *AX*. A half-period later *C* will coincide with *Y* and the total instantaneous amplitude will be *AY*. As displayed on the face of the 'scope, this time variation is transformed into a ripple along the horizontal edges of the pattern, the maximum vertical excursions lying between *AY* and *AX*.

Since the relative amplitudes of the desired and undesired are *AB* and *BC*, respectively, the ratio of desired to undesired is *AB/BC*. This amplitude ratio is also equal to twice the length *AB* divided by the distance *XY*. In terms of the

'scope pattern, this means that the average height of the pattern divided by the vertical distance between a peak and valley of the ripple gives the ratio by which the undesired side frequency is suppressed.

Fig. 2 shows these quantities as they appear on the tube face, together with typical patterns for various ratios of spurious suppression. The latter are drawn as closely to scale as possible, and therefore can serve as a guide to estimating spurious suppression without actual measurement and calculation.

In examining such a pattern, it is necessary that the horizontal sweep in the 'scope be synchronized at some submultiple of the modulation frequency in order to get a stationary picture. Without such synchronization the ripple becomes merely a blur. Since the edge of the blur is a straight line, the unwary operator can lead himself to believe he has a "perfect" s.s.b. transmitter when in actuality it may be pretty poor.

It is also necessary, although it should not be, to emphasize that the audio gain must be kept below the point where any stage in the transmitter tends to saturate. Saturation of an amplifier gives a beautiful pattern, but unfortunately, the actual output contains all sorts of spurious that the 'scope can't show.

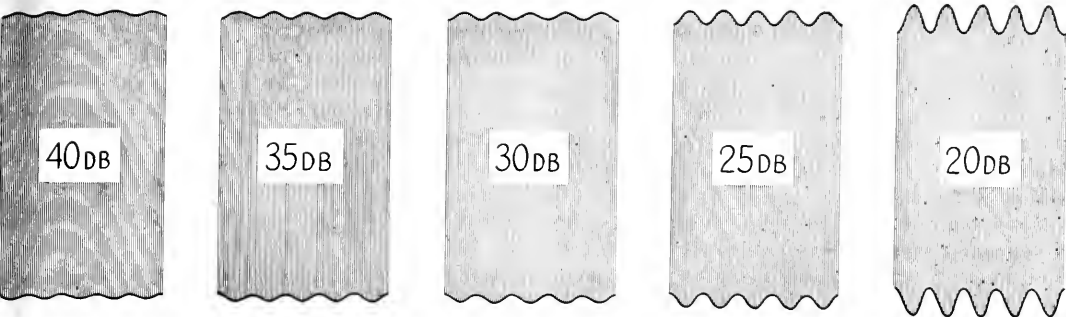
#### Total Spurious

The actual situation in a practical transmitter is not quite so simple as it has been outlined above. The assumption that the transmitter output consists only of the desired side frequency and its undesired "image" can seldom be justified in practice. There are always other components present in the transmitted signal even when the audio input is ostensibly a single tone. These are (1) the residual carrier, if it is not balanced out to considerably better than 40 db. below the desired side frequency; (2) components resulting from harmonic distortion either in the audio input signal or added to the signal in the speech amplifier and modulator; (3) intermodulation components generated in r.f. stages.

These components have a definite frequency spacing in the spectrum, always appearing at some multiple of the audio modulation frequency on one side or the other — or on both sides — of the carrier frequency. The amplitudes of the last two, at least, can easily exceed the amplitude of the undesired side frequency in a well-designed single-sideband transmitter. What the 'scope shows, consequently, is the composite of all the spurious components present.

As a result, the actual shape of the ripple

<sup>1</sup> The term "phasor" is not used in an attempt to confuse the reader, but to conform with a recommendation of I.R.E. "Phasor" is preferred to "vector" because while the vector representation is convenient for showing relative phase and amplitude of a.c. currents and/or voltages, these quantities are not actually vectors — that is, there is no spatial direction associated with them.



$$\frac{\text{DESIRED}}{\text{SPURIOUS}} = 20 \text{ LOG } \frac{X+Y}{2(X-Y)} \text{ DB}$$

FOR 40 DB	$\frac{X+Y}{2(X-Y)} = 100$
35 DB	$= 56$
30 DB	$= 32$
25 DB	$= 18$
20 DB	$= 10$

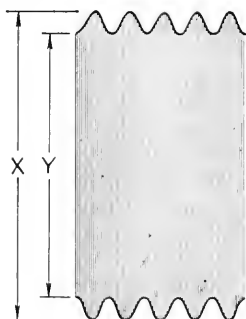


Fig. 2 — Examples of 'scope patterns for various desired/undesired ratios, and the method of calculating suppression of composite spurious from measurement of the 'scope pattern.

along the edge of the pattern is seldom as conventionally sinusoidal as the ripple in the drawings of Fig. 2. The ripple peaks are a measure of the total effect in about the same way that the corresponding peak-to-peak variations are a measure of the total effect of an ordinary a.m. signal displayed on a 'scope. That is, when the a.m. signal is tuned in in the normal way, with the beat oscillator off, using a receiving bandwidth large enough to accept the entire transmitted spectrum, the audio output is the total effect of the variations seen in the 'scope pattern. If the s.s.b. signal is tuned in similarly (using the desired side frequency as the carrier) the audio output from the signal is the total effect of the ripple.

No one component of the several always present in an actual signal can be separated readily from the others in the 'scope pattern. To do this requires a "spectrum analyzer" such as a receiver having sufficient selectivity for the purpose. Also, the peak-to-peak ripple as shown by the 'scope is usually less than the arithmetic sum of the individual components that make up the composite signal because of the non-uniform phase relationship between components. However, it is not likely that any *single* component would have an amplitude greater than that of the composite ripple. Hence the latter would appear to offer a reasonable basis for rating the desired/spurious ratio of the transmitter. As compared with other methods of rating that might be chosen, it has the advantage of being readily measured with the conventional 'scope set-up.

A desired/spurious ratio not exceeding 30 db. at any audio frequency within the nominal

a.f. band of the transmitter can be achieved if the transmitter is adjusted and operated with reasonable intelligence. On a pattern having an average height of 2 inches (typical of a 5-inch 'scope) the peak-to-peak ripple height is  $\frac{1}{6}$  inch for a 30-db. ratio.

—G.G.

## Silent Keys

IT is with deep regret that we record the passing of these amateurs:

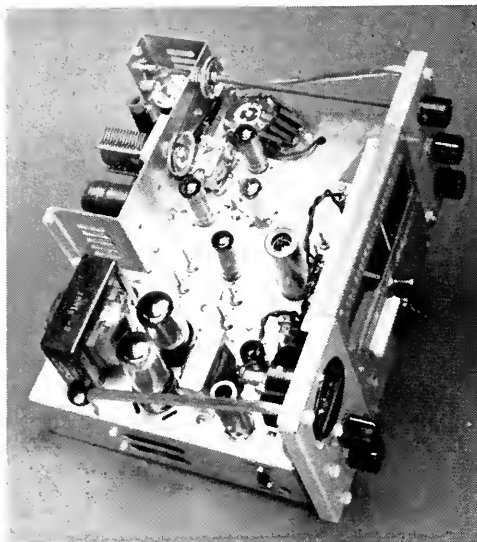
- W1AII, Richard E. Osgood, Windsor, Vt.
- W1QIT, Paul P. Simeone, Andover, Mass.
- W2GAU, Frederick H. Atkinson, New York, N. Y.
- W2OCI, Roy O. Woods, Brooklyn, N. Y.
- W2SDC, ex-W3HEV, Francis R. Richardson, Trenton, N. J.
- W3RH, ex-WSRH, Glenn C. Ornstone, Hyattsville, Md.
- W4FDX, Frank E. Courtney, jr., Augusta, Ga.
- ex-W5AWQ, ex-W5HFS, Ernest R. Brown, Electra, Texas
- W5FMA, Roy E. Duff, Tulsa, Okla.
- W5HK, John C. Maguire, Austin, Texas
- K6ABE, Norman E. Leonard, San Francisco, Calif.
- W6ATS, Sylvester F. Giannetta, Santa Maria, Calif.
- W6KA, Thomas E. Nikirk, San Marino, Calif.
- W6YHG, ex-W5BID, Earl W. Marshall, Jackson, La.
- W7VEM, Erling A. Mattsen, Seattle, Wash.
- W8DVP, William H. Corbett, Cleveland, Ohio
- W8MKX, William R. Shortridge, Big Bay, Mich.
- W8OCM, ex-W7MHQ, Homer P. Steensen, Dayton, Ohio
- W8FWA, Leslie P. Slacks, Sac City, Ia.
- VE7ZZ, Earl C. Chang, Vancouver, B. C.
- 11ACU, Averardo De Donato, Napoli
- SM5ZS, Torsten Elmquist, Bromma
- ZS10, George Gray, Mowbray, C. P.



# • Recent Equipment —

## The T-90 Transmitter

**A**LTHOUGH the T-90 transmitter can be used in mobile, portable or fixed locations, it is apparent that mobile considerations were paramount when it was designed. The packaging and shape are such that it should fit easily under any dashboard, and the scheduled companion



The T-90 covers 80 through 10 meters with VFO or crystal control, 'phone or c.w. Here it is out of its case — the audio section is in the foreground and the 6146 output stage is at the upper left, behind the shield. The switch mounted above the chassis (upper center) selects the fixed capacitors in the output of the pi-tank circuit. The antenna relay can be seen right next to it.

receiver in the same sized package further confirms the viewpoint. However, it isn't fair to label this a "mobile" transmitter and give the impression that home-station operation has thus in some way been compromised, because the T-90 is a full station within its tube capabilities. A built-in antenna relay and the aforementioned packaging simply means that you don't have to add extra gadgets when you put this home station in your car.

The transmitter falls just under the 100-watt class, since the rated d.c. input to the output-stage 6146 is 90 watts on c.w. and 75 watts on 'phone. A glance at the block diagram in Fig. 1 will show a lot more than a mess of words, and you can see that the tube line-up is similar to other transmitters in this class. A 6AQ5 clamp tube is included to protect the 6146 by holding the screen voltage down when there is no excitation, and 6AQ5s are used in the two fixed-tuned amplifier/multiplier stages as well. The oscillator job (VFO or crystal) is delegated to a 6CL6, and its voltages are regulated by the 0B2 to minimize frequency changes with changes in line voltage. The r.f. section can be keyed in either the oscillator and first amplifier/multiplier stage cathodes or in the cathode of the first amplifier/multiplier alone, depending upon your preference and the setting of a function switch on the panel that also cuts in the modulator for 'phone work.

The audio portion starts with a 6AU6 speech amplifier, with a chassis-mounted switch that permits either carbon or high-impedance crystal or dynamic microphone to be used. This is followed by a 6AQ5 driver and a pair of 6AV5 modulators. A negative feed-back loop around

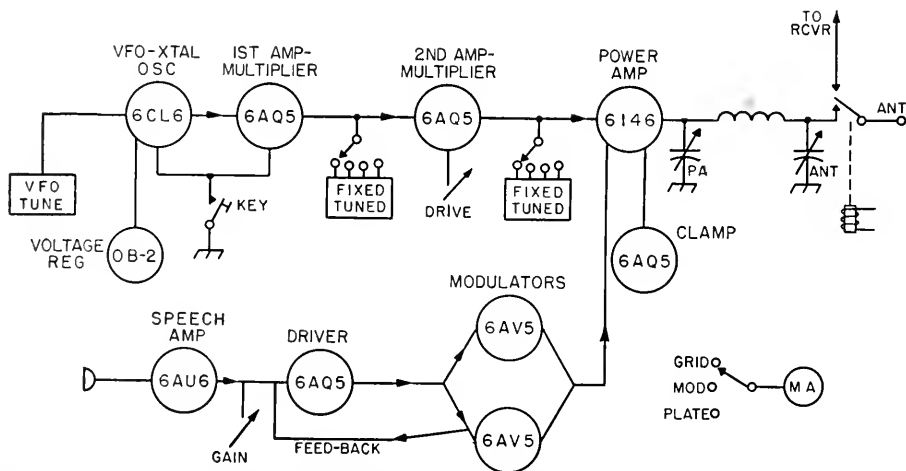


Fig. 1 — Block diagram of the T-90 transmitter. The antenna relay has another circuit (not shown) that turns on the transmitter. The relay is actuated by a panel switch or a push-to-talk switch on the microphone.

the driver stage is included, and it may account for the good quality we observed when the unit was checked on 'phone.

The front panel of this compact ( $12\frac{3}{8}$  wide by  $10\frac{1}{2}$  deep by  $6\frac{3}{4}$  inches high) unit has a couple of departures from usual practice. The first that hits your eye is the apparent lack of a VFO tuning knob! You stop worrying about this when you discover that the VFO tuning and the bandswitch are concentric controls (à la TV), a dodge that makes for an uncrowded panel. The audio gain control, instead of a large knob matching the others in size, is a small knurled shaft that can hardly be seen. And why not? — the audio volume control on a transmitter doesn't get the steady handling that a receiver volume control does. The rest of the controls are what you would expect on a transmitter of this type: a meter switch for the r.f. grid and plate current and the modulator cathode current, a TUNE-CW-HET-PHONE switch (TUNE reduces power to the output stage and disables the modulator, and HET turns on the VFO for frequency spotting or amplifier-only keying), a DRIVE switch for varying excitation



This close-up view of the 6146 output stage shows the plate tuning capacitor and the three sections of the output inductor.

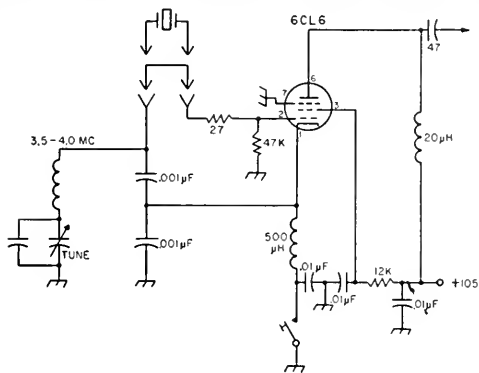


Fig. 2 — Simplified oscillator circuit of the T-90. When using VFO, the crystal socket requires a shorting plug. When crystal control is used, the VFO tuned circuit can be used to "pull" the crystal frequency slightly and thus "zero in" on a net frequency.

by changing the screen voltage to the driver stage, and PLATE and ANT tuning.

The ANT tuning control is more than meets the eye. Since a pi-network output circuit is used, there is the normal need for a wide variation in output capacitance. In the T-90, the control turns the rotor of a 150-μf. variable capacitor. On the far end of the rotor shaft there is a pin that engages a spoke on a switch shaft



An additional shield cover has been removed to show the VFO compartment (lower center). The hub and spokes at the center left drive the output-capacitor switch shown in another photograph. The spokes are driven by an arm on the shaft of the output tuning capacitor at the lower left.

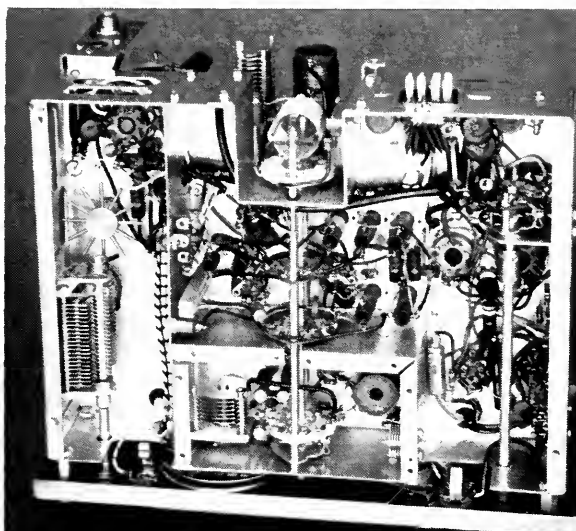
once every revolution. Thus each time the capacitor shaft makes a full revolution, more or less fixed capacitance is also thrown into the circuit via the switch. This tricky little device can be seen in one of the photographs.

When crystal-controlled operation is desired, the crystals can be changed from the front panel by removing the crystal access door on the panel and plugging in the desired crystal. When VFO operation is used, a shorting plug is required in the crystal socket. The oscillator circuit is shown in Fig. 2 — it is a little unusual in that the VFO tuned circuit is used to "rubber" the crystal and permit its frequency to be pulled slightly.

Two power supplies are available for use with the T-90. The APS-90 is for use in fixed-station operation and works from the 115-volt 60-cycle line, and the VPS-90 vibrator supply is designed to furnish the necessary power from either a 6.3- or 12.6-volt d.c. source.

The T-90 is a product of Harvey-Wells Electronics, Inc.

— B. G.



# Happenings of the Month

## ELECTION NOTICE

**To All Full Members of the American Radio Relay League Residing in the Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern Divisions.**

An election is about to be held in each of the above-mentioned divisions to choose both a director and a vice-director for the 1956-1957 term. These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. The election procedures are specified in the By-Laws. A copy of the Articles of Association and By-Laws will be mailed to any member upon request.

Nomination is by petition, which must reach the Headquarters by noon of September 20th. Nominating petitions are hereby solicited. Ten or more Full Members of the League residing in any one of the above-named divisions may join in nominating any eligible Full Member residing in that division as a candidate for director therefrom, or as a candidate for vice-director therefrom. No person may simultaneously be a candidate for both offices; if petitions are received naming the same candidate for both offices, his nomination will be deemed for director only and his nomination for vice-director will be void. Inasmuch as all the powers of the director are transferred to the vice-director in the event of the director's resignation or death or inability to perform his duties, it is of as great importance to name a candidate for vice-director as it is for director. The following form for nomination is suggested:

### Executive Committee

*The American Radio Relay League  
West Hartford 7, Conn.*

*We, the undersigned Full Members of the ARRL residing in the ..... Division, hereby nominate ..... of ..... as a candidate for director; and we also nominate ..... of ..... as a candidate for vice-director; from this division for the 1956-1957 term.*

*(Signatures and addresses)*

The signers must be Full Members in good standing. The nominee must be a Full Member and the holder of an amateur license, and must have been a member of the League for a continuous term of at least four years at the time of his election. No person is eligible who is commercially engaged in the manufacture, sale or rental of radio apparatus capable of being used in radio communications, or is commercially engaged in the publication of radio literature intended in whole or in part for consumption by radio amateurs.

All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon EDST of the 20th day of September, 1955. There is no limit to the

number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of vice-director. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and for vice-director but members are urged to interest themselves equally in the two offices.

League members are classified as Full Members and Associate Members. Only those possessing Full Membership may nominate candidates or stand as candidates; members holding Associate Membership are not eligible to either function.

Voting by ballots mailed to each Full Member will take place between October 1st and November 20th, except that if on September 20th only one eligible candidate has been nominated, he will be declared elected.

Present directors and vice-directors for these divisions are as follows: *Atlantic:* Gilbert L. Crossley, W3YA, and Charles O. Badgett, W3LVF. *Canadian:* Alex Reid, VE2BE, and Reginald K. Town, VE7AC. *Dakota:* Alfred M. Gowan, W0PHR, and Forrest Bryant, W0FDS. *Delta:* George H. Steed, W5BUX, and George S. Acton, W5BMM. *Great Lakes:* John H. Brabb, W8SPF, and Robert L. Davis, W8EYE. *Midwest:* William J. Schmidt, W0OZN, and James E. McKim, W0MVG. *Pacific:* Harry M. Engwicht, W6HC, and (no vice-director). *Southeastern:* James P. Born, jr., W4ZD, and Randall E. Smith, W4DQA.

Full Members are urged to take the initiative and to file nomination petitions immediately.

For the Board of Directors:

A. L. BUDLONG  
Secretary

July 1, 1955

## F.C.C. NOTES

Richard A. Mack, for some years a member of the Florida Railroad & Public Utilities Commission, has been appointed to the Federal Communications Commission. He replaces Miss Frieda Henneck, whose term expired June 30th; she is returning to law practice.

Edwin L. White, W4AS, since its establishment in 1950 the Chief of FCC's Safety & Special Radio Services Bureau (parent bureau for the amateur service) retired July 31st from many years of government service. His successor is Curtis B. Plummer (ex-W3KRK), former head of the Broadcast Bureau.

## "WT" PREFIX DENIED

A Texas amateur recently petitioned the Commission to include the letter "T" in the prefix of call signs issued to Technician Class amateurs "for the purpose of distinguishing this class of amateur radio station from other classes of amateur radio stations and discouraging unauthorized operation by Technician Class stations in frequency bands allocated for the exclusive use of higher class amateur radio stations."

FCC has denied it, saying that adoption "would require the modification of approximately 12,207 Technician Class Amateur Radio Stations, and with the ever increasing work load in the Commission and with the limited personnel available, the administrative difficulties created by the adoption thereof would not be justified by the benefits, if any, derived therefrom."

### F.C.C. APPLICATIONS

Amateur applicants commonly suffer nervousness in taking the code test; they apparently are similarly afflicted when filling out application forms. FCC's licensing branch has recently had more trouble than usual with errors in application blanks, including renewals. Many applicants, undoubtedly through oversight or carelessness, fail to answer the question, "Are you a representative of an alien or of a foreign government?" Many fail to notarize. Many, in the case of renewals, omit necessary data such as place and date of birth, apparently figuring FCC already has this information (it does, but the info is usually required for positive identification of the application). And you'd be surprised how many fellows fill out "date of birth" with the proper month and date — but with the year 1955!

We can all help ourselves by helping FCC — be careful that *your* application is completely and accurately filled out so that processing will not be delayed.

### LAOS OFF BANNED LIST

In mid-July FCC announced that the government of Laos has withdrawn its objection, earlier filed with the International Telecommunications Union, to communication between its amateurs and the rest of the world. The prefix is XWS, and work with these stations is now permissible.

### THIRD-PARTY TRAFFIC

In the handling of third-party traffic internationally, aside from countries where special agreements exist (Canada, Chile, Cuba, Ecuador, Liberia, Peru) we have had a convenient rule-of-thumb that traffic is permissible with any amateur station possessing a one- or two-letter W or K prefix. There is now an exception: KA. The Japanese government has indicated that it wishes privileges available to all amateur stations in its country to be uniform; inasmuch as JAs of course have no third-party privileges, the KAs in Japan are now also restricted from such activity. Other prefixes, even in the same area, are not affected; e.g., Okinawa, with the prefix KR6, is still okay for traffic.

### RTTY SHIFT

The ARRL Board of Directors at its May meeting instructed the General Manager to file, subject to an investigation as to its feasibility, a request with the Federal Communications Commission to amend the amateur rules so as to permit frequency shifts of less than the present

(Continued on page 128)

### WHAT BANDS AVAILABLE?

Below is a summary of the U. S. amateur bands on which operation is permitted as of August 1st. Changes will, as usual, be announced by W1AW bulletins. Figures are megacycles. A0 means an unmodulated carrier; A1 means c.w. telegraphy; A2 is m.c.w.; A3 is a.m. 'phone; A4 is facsimile; A5 is television; F1 is frequency-shift keying; n.f.m. designates narrow-band frequency- or phase-modulated radiotelephony; and f.m. means frequency modulation, 'phone (including n.f.m.) or telegraphy.

3.500-4.000	— A1
3.500-3.800	— F1
3.800-4.000	— A3 and n.f.m.
7.000-7.300	— A1
7.000-7.200	— F1
7.200-7.300	— A3 and n.f.m.
14.000-14.350	— A1
14.000-14.200	— F1
14.200-14.300	— A3 and n.f.m.
14.300-14.350	— F1
21.000-21.450	— A1
21.000-21.250	— F1
21.250-21.450	— A3 and n.f.m.
26.960-27.230	— A0, A1, A2, A3, A4, f.m.
28.000-29.700	— A1
28.500-29.700	— A3 and n.f.m.
29.000-29.700	— f.m.
50-54	— A1, A2, A3, A4, n.f.m.
51-54	— A0
52.5-54	— f.m.
144-148	} A0, A1, A2, A3, A4, f.m.
220-225	
420-450 <sup>1</sup>	} A0, A1, A2, A3, A4, A5, f.m.
1,215-1,300	
2,300- 2,450	
3,300- 3,500	
5,650- 5,925	} A0, A1, A2, A3, A4, A5, f.m., pulse
10,000-10,500	
21,000-22,000	
All above 30,000	

<sup>1</sup>Peak antenna power must not exceed 50 watts.

In addition, A1 and A3 on portions of 1.800-2.000, as follows:

Area	Band, kc.	Power (watts)	
		Day	Night
Minn., Iowa, Mo.,	1800-1825	500	200
Ark., La. and east, including Puerto Rico and Virgin Ids.	1875-1900		
N. and S. Dak., Neb.,	1900-1925	500*	200*
Colo., N. Mex., and west, including Hawaiian Ids.,	1975-2000		
Texas, Okla., Kansas	1800-1825	200	75
	1875-1900		

\* Except in State of Washington where daytime power limited to 200 watts and nighttime power to 50 watts.

**Novice** licensees may use the following frequencies, transmitters to be crystal-controlled with a maximum power input of 75 watts.

3.700-3.750	A1	21.100-21.250	A1
7.150-7.200	A1	145-147	A1, A3

**Technician** licensees are permitted all amateur privileges in 50-54 Mc. and in the bands 220 Mc. and above.



# Hints and Kinks

## For the Experimenter



### DEBURRING TOOLS

**J**AGGED BURRS around screw, ventilation, bezel and socket holes are not only unsightly indicators of poor workmanship but also constitute a considerable hazard, as the burrs have and retain razor-sharp edges.

Deburring is an irritating and time-consuming job under most conditions because of lack of suitable tools. With soft metals, a knife blade is partially satisfactory, but may slip out of the hole being deburred, cutting a deep gouge in the panel, or a gash in the hand. Small hand grinders are somewhat more satisfactory, at a cost of about \$25.00 each, plus about one cent per hole for wheel replacement. Metal countersinks have been used, but these, having a 55- or 60-degree included angle, ream the hole almost as fast as they remove the burr.

Quite satisfactory deburring can be done with a carpenter's wood countersink having an included angle of approximately 90 degrees. These, which come in all sizes up to about  $\frac{3}{4}$  inch in diameter, are supplied with a square shank. To convert a carpenter's wood countersink into a deburring tool, grind off the corners of the shank and drive the shank into a plastic screwdriver handle from which the blade has been pulled.

Performance will be most satisfactory if the axes of the handle and of the countersink coincide. Length of the finished tool should be approximately six inches, with a tolerance of about plus or minus one inch to suit the materials available and the user's personal taste.

Larger holes are easily deburred by use of an automotive valve-seat reamer. These come with four, five, and six blades and cost from \$2.00 up. No changes are needed in this tool, and those with a large number of blades, such as six, are preferable to the four-bladed type. When only steel is to be used, an abrasive valve seater, which is merely a conical grindstone with a large included angle, such as 105 degrees, is very effective. This cannot be used with soft metals, such as aluminum, as the abrasive will plug up after deburring only a few holes.

— Ronald L. Ives

### STAND-BY SWITCH FOR THE HQ-129X

**D**URING week ends it was desired to leave my recently acquired HQ-129X on stand-by for long periods and this made desirable the removal of B+ from all tubes of the receiver. This meant the addition of a switch in the ground side of the plate-supply circuit, but the thought of any panel drilling that might adversely affect the resale

value of the receiver was deemed objectionable.

The solution arrived at was to remove the existing 5000-ohm sensitivity potentiometer and replace it with a type having an on-off switch mounted on the rear cover. The switch is, of course, used to break the negative plate-supply lead. With the revision, the receiver is turned on or off with the sensitivity control, the front panel remains intact, and the "relay control" function of the original stand-by switch ( $S_6$  of the circuit for the HQ-129X) is not impaired.

— Edwin A. Gilcher, W8NFW

### MORE ABOUT THE NOVEL VENTILATING SYSTEM FOR MOBILE UNITS

**W**HEN using the ventilating suggested by W9JX in *QST* for June, 1955, it is advisable to avoid connection to the vacuum line from the intake system. Otherwise, you may run into valve trouble caused by an improper air-gas mixture from the carburetor.

— Bill Norman, W5TXM

### PERIODIC INSPECTION FOR COPPERCLAD WIRE ANTENNAS

**H**ERE is a tip, learned from bitter experience, that should benefit any of the gang who use surplus copperclad wire for their sky hooks. Antennas made from this material require inspection once a year or so if deterioration in advance of actual breakdown is to be detected. In my own case, I had a nifty 340-footer about 50 feet high that was made with surplus aircraft-trail wire obtained from a bargain 3000-foot reel. After about four years of service — without inspection — trouble started. Wherever the wire came in contact with stand-offs, strain insulators or other supports, and at points where bends were necessary, the copper coating had worn through and rust had eaten into the core, thus creating about half a dozen high-resistance joints that finally broke down.

— Wm. Plimpton, W2IXH

### SCORING ALUMINUM WITH A GLASS CUTTER

**A**N ordinary dime-store glass cutter (disk roller type) makes an excellent tool for cutting aluminum sheet. Just score each side of the sheet and then flex the aluminum until it parts at the score. If the sheet being worked with is fairly large, it pays to clamp the metal along the score lines by one means or another.

— Kenneth Cary, K2CAK



# Correspondence From Members -

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

## YOU'RE COVERED

705 Ninth Avenue  
Brookings, So. Dak.

Editor, *QST*:

I have read with interest your article "Lightning Protection for the Transmitting Antenna (July *QST*). Inasmuch as I am in accord with the article and endorse all the ideas involved there is one thing that should be straightened out. There is no condition in any of the fire forms used for insurance purposes on a private dwelling that would invalidate an insurance policy insuring such private dwelling whether that antenna is a TV antenna or a 5-element beam for 10 meters.

There are too many people now who believe that insurance is a necessary evil and one of those articles that have to be paid for because of a loan on their dwelling. If you can find any of the so-called fine print excluding coverage in a private dwelling fire form because of an improperly-installed antenna, please send it out to this ham. It would be very interesting, I can assure you.

For further information I would suggest that you contact two of the best insurance companies in the world for further information, The Hartford Fire and The Travelers, both of whom we represent.

— Robert T. Bates, WØUDI

[Error's Note: Hartford Fire confirms nothing in the fine print invalidates a policy specifically because of an antenna installation.]

## ET REPLY

P. O. Box 1636  
Addis Ababa, Ethiopia

Editor, *QST*:

Many thanks to WØPDN for his understanding letter in the May issue. He is correct in his assumption that air mail stamps for every QSO is completely out for most Ethiopians. Especially those in the Armed Forces have an allowance not at all comparable with that of the U. S. Forces, and the civilian standard could be regarded much in the same way.

One of the most active ham stations is that of the Imperial Ethiopian Air Force, ET3Q and ET3R, which is worked entirely by A. F. personnel. I will admit that the promised QSLs from here, in many cases, have not been sent in the past. I enclose a QSL card from ET3Q which has been released for use only some weeks ago by His Imperial Majesty. I now hope the QSL cards from here will drop in more regularly at the stations of U. S. hams. Please, don't ask for air mail.

— Gunnar Ensjo, SM5AES/ET3Q  
Imperial Ethiopian Air Force

## SEVENTY-FIVE

P. O. Box 3093  
Rochester 14, N. Y.

Editor, *QST*:

... Recently I came back to 75 because a fellow ham friend of mine vacationing in Canada asked me to keep morning skeds with him. ...

I listened around and I found new voices and recognized some old ones. But what surprised me very much was a new mode of calling which must be peculiar to 75 because I have not heard that stuff on other bands. For example: "Calling CQ class A," and "Calling CQ no lids." Then I heard guys talking about guys and mentioning names and call letters openly. Intentional QRM galore. Traffic nets in bunches, where real traffic just is not it. I asked one old timer "How?" and he said "Oh, that's been going on for

years, where've ya been?" In that period of time I was absent from 75 I think I've come back a couple of times before, but did not stay as long as this time. I listened some more and I got disgusted with it.

My opinion of that particular brand of ham radio is that it is not genuine ham radio at all; one of the guys I heard is suffering from such an inferiority complex that he is making his friends and others who bother with it, act like foolish kids. As soon as my friend returns from his vacation, I'll go back to DX-c.w. for that band, 75, is for the birds as far as I'm concerned.

— Charles I. Otero, W2UPH

503 Sunset Road  
W. Reading, Penna.

Editor, *QST*:

I am secretary of the Reading Radio Club, members of which have participated in many of the activities mentioned in your July editorial, "Public Relations." ... Our latest effort was the Powder Puff Derby; we were asked to relay between the Reading Airport and the terminus of the Derby, Springfield, Mass. ... Most of the boys on 75 are swell fellows; many of them cooperated with us 100%; however, two or three gave us a rough time. ...

We fully realize that all amateur frequencies are open to everyone, and we also realize that the public in general resents being pushed around. ... But when we politely requested W3 — to keep this particular channel clear he resented the request, called us Space Cadets, and flatly refused to stay off the frequency. ... Several other stations also resented our request. For instance, W2 —; every time we would sign he'd come on the frequency calling another station. We doubt that he actually was in contact with anyone because of the fact that whoever he might have been talking to surely could not have stopped transmitting at the exact time we did, so many times in succession. This same W2 — would hook up with a powerful station elsewhere in the band, tell him he had QRM and that he should change frequency and move down on the frequency we were using. Then both would carry on a QSO.

What would the Old Man think about such tactics? What would happen in an emergency? Why can't we look at it in this way and realize that here are a bunch of hams doing something to publicize ham radio, giving of their time, gratis, trying to live up to the concept of your editorial, and give us a hand instead of a fist.

Before I close, we of the Reading Radio Club wish to thank again the fellows who cooperated with us in this venture.

— Stanton L. Bast, W3CCH

## EXTRA CLASS PRIVILEGES

446 N. W. 8th St.  
Homestead, Fla.

Editor, *QST*:

I've been thinking over the situation of the Amateur Extra Class license and have come up with an idea which might provide a little incentive for getting a ticket.

Some of the little used portions of the ham bands could be set aside exclusively for Amateur Extra ops. For example, 14,300-14,350 kc. could be used.

Another thing, which would probably bring a lot of argument, would be to allow only Amateur Extra operators to employ such advanced techniques as RTTY and s.s.b.

Let's hear from the fellows on this subject.

(Incidentally, I'm not Amateur Extra, but General Class, although I do intend to get it just as soon as I have had my ticket long enough.)

— Bob Payne, W4CWZ

# Amateurs in Operation Alert, 1955

## *A Summary of Reports of Amateur/RACES Participation in FCDA's Nation-wide Civil Defense Test*

BY GEORGE HART, WINJM

ON June 15th, at 1600 GMT, Civil Defense organizations throughout the country swung into action to put to the test our nation-wide c.d. establishment. The entire nation was subjected to a thorough simulated plastering by nuclear weapons, from twenty kiloton (1x) to five megaton (250x) in size. As far as nuclear attack is concerned, FCDA was assuming the worst, except that all concerned were notified in advance.

Under date of June 1st, ARRL notified its entire contingent of Emergency Coordinators (some 1700 of them) of the coming exercise, urging them to activate their RACES or pending RACES plans in this exercise. Instead of requesting them to fill out another questionnaire form, we this time asked for a simple narrative of activities in their area. This report is a summary of such narratives, condensed or reduced as necessary to fit into available *QST* space. If the report of activities in your area is not, perchance, included, it is because up to copy time nothing was received indicating that you were active.

### **Arizona**

In Tucson, the civil defense council dispersed to a fringe area (Marana Air Base) and depended on Al Steinbrecher, W7LVR (SCM), to maintain

contact with elements not present at this control center. Al did a good job and was relied on heavily.

### **California**

The Lennox District of the Los Angeles County Disaster-Civil Defense Authority (RACES) operated as the Lennox Disaster-Civil Defense Net (AREC) extensively. Prepared messages were distributed by the ten-meter mobile stations, who reported the locations of messages left and the party to see the NCS. This was posted on a map. Then 2-meter stations were dispatched to pick up the messages and transmit them to the 2-meter NCS, where they were answered and relayed back to the originating station. RACES tactical calls were used by all authorized stations. RO and EC W6NHP states that there are now 52 members of the Lennox C.D. Net with RACES certifications. Forty-eight amateurs participated.

### **British Columbia**

SEC VE7DH summarizes the operation in British Columbia. Nineteen stations participated, with sixteen monitoring and ready to help. A total of 322 messages were handled, including 87 by VE7QC, 118 by VE7KL (NCS) and 47 by VE7NO. VE7ASR acted as mobile net control. VE7AHJ monitored Alaska alert KL7TI. Frequencies used were 3505, 3740, 3755, 3995 and 147.33 Mc. VE7DH says only one thing bothers him: how did controls keep on operating at ground zero after a fifty kiloton bomb exploded?

### **Colorado**

W0TVB, EC for Mutual Aid Area No. 10 in Northwestern Colorado, reports operation from the Moffat County Courthouse in Craig, using his transmitting equipment and call. Activity commenced at 0900 MST, with total operation of 15 hours before the test terminated. Contact was maintained sporadically with state control at Denver, handling nine outgoing and ten incoming messages. W0SJJ was active from Steamboat Springs, Colo. All amateurs taking part were AREC members. Operation was completely on auxiliary power for one hour. The EC gives full credit to members of the Yampa Valley Radio Club, all AREC members, for all equipment and improvements, including the installation of the civil defense director himself. He says, "We are proud of the accomplishments we have made — so far."

### **Connecticut**

In Manchester, 18 operators were asked for but 24 signed up to keep the control station open for



W4CDA, Kentucky SEC, hands a message to Judge Gilbert White, Deputy Director of Kentucky Department of Civil Defense during Operation Alert. At left is Col. Thomas J. Quinn, Coordinator of State Mobile Support Groups. The Boy Scout runner in the center is Jimmy Richardson. Photo courtesy *The State Journal*, Frankfort, Ky.



A partial shot of Connecticut's Area I RACES Control Station, located at the State Police Barracks in Ridgefield. At this location, six nets were manned by sixteen operators working in two shifts, six hours on and six hours off, during Operation Alert.



the full twenty-six hour period of the drill. Traffic was handled both for the local area and relayed for stations not in good contact with Area Control in Rocky Hill. Civil defense officials were greatly pleased with the amateurs' response.

Connecticut's Area I RACES organization, consisting of 22 towns in Fairfield County, was active to the extent of 180 operators manning 65 stations throughout the 26 hours of the test. The message total was 2700. This is a considerable increase over the 2156 total for 1954, indicating both the increased efficiency and expansion of the organization. Traffic was handled at the rate of 104-per-hour or 1.7-per-minute throughout the entire test period. Area I Radio Officer W1DBM spent most of the time traveling from one local control to another to visit, inspect and take pictures. Many of the control centers had a full staff of service chiefs on duty, while others had only skeleton crews. W1DBM opines that although the performance in Area I was outstanding, it would be inadequate in the event of a real bombing, the 2700 messages being but a drop in the bucket compared with the actual need.

#### **Delaware**

For the first time, the Communications Division of Delaware Civil Defense functioned as expected and desired, reports W3DB, Deputy Chief of Communications. RACES operated on 3507.5 kc. and 3580, with local work on 10, 6 and 2 meters. The State control station at Delaware City, New Castle County control at New Castle, Kent County control at Dover and Sussex County control at Georgetown were all alerted and ready to go at the appointed time. The state control station alone handled more than 250 messages during the test. Over fifty amateurs took part.

#### **Illinois**

From DeKalb, Ill., we have a clipping quoting the DeKalb c.d. director as saying that "the mobile communications system set up by the Kishwaukee Radio Club made an excellent showing." Mobiles were organized to patrol various sections of the city, reporting conditions to a central location. W9WTF is the spark-plug.

#### **Indiana**

The Evansville gang was active. A rig on 147.3 Mc. f.m. was used at the control center, Dress Memorial Airport, to control a similar unit located in the "devastated" area. A unit on 29.6 Mc. was used to handle traffic to 20 mobiles be-

longing to RACES members. Ten-meter set-ups were also located at the National Guard Armory and the local taxicab dispatcher's office so that medical units and taxicabs could be dispatched as needed from the control point within the affected area. State-wide communication was conducted on 3910 kc.

#### **Kentucky**

SEC W4CDA reports that Kentucky civil defense was provided with c.w.- and 'phone-net communications for their five Mobile Support Group cities. W4CDA operated the c.w. net on 3600 kc., using equipment set up by State Radio Officer W4MGT. W4TFK, Frankfort EC, operated his own 'phone station. Each station handled approximately 30 test messages.

W4JSH, EC for Lexington, reported on Operation Alert for the Fifth Mobile Support Group. This group handled 65 messages, participation by nineteen stations on 3600, 3945 and 3960 kc. Operating time was from 1815 to 2215 EST. Representation was thus provided for seven of the 25 counties making up the Fifth Mobile Support Group.

#### **Louisiana**

SEC W5IUG reports that eight ECs reported participation, plus the SEC and SCM, and that 69 amateurs took part throughout the state.

#### **Maryland**

In Baltimore, 165 amateurs participated. Radio Officer W3NNX and his assistant, W3YYB, quickly alerted and activated all stations with such good effect that Col. Milani, c.d. director for the city, said, "This group, following amateur tradition, fulfilling a most important function, seriously, calmly and expeditiously carried out their duties in a professional manner."

St. Mary's County amateurs also report participation. W3BUD moved his 75-meter station to county c.d. headquarters at Leonardtown, maintaining a circuit to W3CBW at state c.d. headquarters during the alert. In addition, a county net of six stations on another frequency was established. W3AVL's kilowatt proved effective in relaying to state Hq. on occasions. W3ZZK/m located and delivered traffic to a c.d.

(Continued on page 130)

# YL NEWS and VIEWS

BY ELEANOR WILSON,\* W1QON

## Young Ladies' Radio League First International Convention

Judging from reports received, the YLs who attended the Young Ladies' Radio League's First International Convention will long remember the precedent-setting affair. The convention is reported here in considerable detail so that those YLs who were not able to be there in person may catch the spirit of the affair. Thanks are due to Mary Brandvig, W6LBO, Convention Publicity Co-Chairman, for furnishing most of the information.

On Friday afternoon, June 24th, the three-room suite engaged by the YLRL at the Miramar Hotel in Santa Monica, Calif., bulged with registrants. The club photograph albums and scrapbooks were on display and continuous rag-chewing was in order.

At the business meeting Saturday morning, Mildred Griffin, W6PJU, past-president of the Los Angeles YLRC, presided as official hostess. Each YL was given a bracelet of copper coiled links with YLRL insignia, on which Martha Edwards, W6QYL, and her committee — K6s EJE and GMX, and W6s DXI, PJU, and QGX — had worked since fall. Souvenir program booklets in the official club colors — silver and blue — were distributed.

General Convention Chairman Maxine Willis, W6UHA, opened the meeting with a welcome and introduction of

\*YL Editor, QST. Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

\*All officers were in office at the time of the convention, which occurred only a few days before a new term began (July 1st). A new slate of officers now rules.

Seated at the banquet table with General Chairman of the Convention, Maxine Willis, W6UHA, and YLRL President, Vada Letcher, W6CEE (first two seated on left) are several honored guests. (Standing, l. to r.): Jeanne Collins, KL7RN, of Minchumina, Alaska; Walter Joos, W6EKM, ARRL Director of the Southwestern Division; John Reinartz, K6BJ, guest speaker; Bernard Linden of the Los Angeles office of the FCC; and veteran YL Elizabeth Zandonini, W3CDQ. (Seated, l. to r.): W6UHA; W6CEE; Mildred Griffin, W6PJU, past-president of the Los Angeles YLRC; Grace Dunlap, KZ5DG, visitor from the Canal Zone; and Gilda Shoblo, W6KER, YLRL Vice-President.



YLs from the following areas: W3, 5, 6, 7, 8, and 0, KZ5 and KL7.

The importance of communication in today's world was stressed in an address by the Mayor of Santa Monica, the Honorable Ben Benard.

## Business Meeting

President of the YLRL, Vada Letcher, W6CEE,\* conducted a brief business meeting, which included the reading of reports from her officers. The report of Publicity Chairman, Gloria Matuska, W9YBC, was read in absentia by W6LBO. W3PVH, Betty Frederick, delegate from W3UUG, Miriam Blackburn, Secy.-Treas., read the financial report, which revealed a treasury balance on June 1, 1955, of \$964.35. Vice-President Gilda Shoblo, W6KER, reported on contest activity during the year and requested that suggestions regarding the conducting of contests and activities be forwarded to the new Vice-President, W9YBC. W6CEE thanked each member and officer for the coöperation extended to her and expressed the hope that the new President, Cris Bowlin, W9LOY, and all of the other officers would receive the same consideration.

The First and Second Vice-Presidents of the YLRL, Carol Witte, W6WSV, and Enid Aldwell, W6UXF, spoke of the history and development of the organization, from its beginnings in 1939 to the present day. Greetings were given by W5RZJ, W6NZP, W6MWU, and W1QON (the last a written message read by W6KER).

Honorary membership for life in the YLRL was conferred on Ethel Smith, W3MSU, YLRL founder and first President. An acoustic, composed and hand-worked by Vi Grossman, W2JZX, was to be sent to Ethel.

The YLRL song, with words by Dorothy Willett, W8UDA, was sung in unison and led by Betty Wilson, W6REF. Betty also sang a new YLRL Convention song, with words and music by W6UHA.

Three convention tickets were awarded — one to W5RZJ, who won the Membership Contest, one to W6WSV, who was the member with the highest individual score in the Los Angeles YLRC, the club which had the greatest number of new members. The third ticket was awarded to KZ5DG, Grace Dunlap, as a representative of the area which had the greatest percentage of membership increase during the past year.

Five special gilt-trimmed YLRL certificates were awarded to W4JCR, Anita Bien, for outstanding work in revising the club Constitution and By-laws (see W4 YL photo elsewhere in this department); to W6NAZ, Lenore Conn, for her excellent work in editing and publishing the YLRL

Directory; to W6UHA for her efficient organization of the convention; and to W6LBO and W9YBR for their nationwide campaign of publicity for the YLRL.

### Reception

After the business meeting, the group adjourned to the Palm Room of the hotel, where anthurium, orchids and ti leaves, flown from Hawaii by W6SHR's OM, provided a tropical background for the miniature ceramic ham shacks made by W6MFP, Agnes Langevin, Decorations Chairman. Jayne Dynes, K6GMX, had assembled and soldered a variety of antenna arrays which stood over the little ham shacks. One of the little shacks, with a three element 20 meter beam, duplicate of W6UHA's station beam, was wired for a lamp as a gift to Maxine from the Los Angeles YLRL.

Presentation of leis from members of the Honolulu YL club, flown from that city by arrangement of KH6AFN and W6SHR, was done in the Hawaiian manner with 88s from W6KER to W6CEE, W6UHA, and to each new district chairman or her proxy.

Fashions from a near-by clothing salon were modeled. While Martha Edwards, W6QYL, modeled the wedding gown she made of the silk brocade her recent bridegroom, W6RDQ, brought from Japan, Lenore Conn, W6NAZ, narrated the story of their courtship and wedding.

Elizabeth Zandonini, W3CDQ, and Evelyn Scott, W6NZP, recounted meetings with overseas YLs during recent travels abroad. KL7RN and KZ5DG spoke on YL activities in Alaska and in the Canal Zone.

### Banquet

Hundreds of Hawaiian orchids, tall green tapers, and giner leis decorated the tables for the evening banquet. W6UHA was mistress of ceremonies. Each YL banquet guest was presented with a certificate designed by W6KER and W6MFP, making the recipient a charter member of all future YLRL Conventions.

A talk on the early days of amateur radio by John Reinartz, K6BBJ, was one of the features of the evening. Mr. Reinartz declared that he was especially happy to speak on the occasion, for after thirty-five years of married life, his wife had recently become Novice KN6MJH.

Enid Aldwell, W6UXF, and her Bavarian Dance Group, entertained with colorful and authentic dances of Bavaria.

Bernard Linden, Engineer-in-Charge of the Los Angeles area office of the FCC, brought a message of congratulations and clippings of early-day YLs from his personal scrapbook.

Although many YLs had to leave after the main convention events on Saturday, a number remained in the area and visited the homes of Los Angeles YLs and attended a mobile caravan to CBS-TV City on Monday, arranged by Mary Kay, W6JMC.

And thus the first international convention of the YLRL came to an end.

The convention is significant not only of the progress of the YLRL—it reflects the increase in numbers and activity of YLs in general. A few years ago a convention of this sort could not have occurred. Now the question is when and where is the next one going to be? With the example of hard work and enthusiasm displayed by the YLs of the Los Angeles YLRL, the way points to bigger and better YL get-togethers in the future.

### Yls in Attendance

A list of the eighty YLs who registered at the Convention follows:

W3s CDQ, PVH; W5s CGE, RZJ, SYL, WUE; JN7VWU, W7s GXI, KOY, LCS, PUV, SBX, SNP, ULK; W8UAP, WN8TAU K0VTY, ex-W3LSX; W0s ERR, PIK, TYB; KL7RN; KZ5DG.

K6s ACF, ANG, AYJ, BUS, BXX, CYZ, DRS, EIA, EJE, EIA, EXV, GQW, HMP, JCL, KCI; KN6s HIW, HRW, JHD, JRL, KEK, LPM, MJH; W6s AKE, AVF, BDE, CEE, DPB, DXI, EHA, FEA, GAI, GMX, HEG, IWG, JCA, JMC, JZA, KER, KYZ, LBO, MFP, MWU, NAZ, NZP, PJU, QBK, QGX, QMO, QOG, QOO, QYL, REF, SGL, SHR, UHA, UXF, WRT, WSV.

Total attendance, which included YLs, OMs, and invited guests, was one hundred forty-seven.

### Convention Committee

Convention Chairman: Maxine Willis, W6UHA.

Official Hostess: Mildred Griffin, W6PU.

Business Manager: Evelyn Scott, W6NZP; Helene Leonard, W6QOG.

Decoration: Agnes Langevin, W6MFP; Jayne Dynes, K6GMX, Lorraine Joslin, W6SIIR.

Favors: Bracelets: Martha Edwards, W6QYL; Harryette Barker, W6QGX; Frances Staben, K6EJE; Jayne Dynes, K6GMX; Gladys Eastman, W6DXI.

Certificates: Gilda Shoblo, W6KER; Agnes Langevin, W6MFP.

OMs' Entertainment: Maxine Willis, W6UHA; Lenore Conn, W6NAZ; OM Lee Eastman; OM Ralph Blakesley.

Prizes: Ann Joyce, W6KYZ.

Program: Harryette Barker, W6QGX; Gladys Eastman, W6DXI; Vada Letcher, W6CEE.

Publicity: Mary Brandvig, W6LBO; Gloria Matuska, W9YBC.

Reception Transportation: Lorraine Freeberg, W6AKE.

Reservations: Elsa Wheeler, W6JZA; Billie Blakesley, K6ANG.

Sunday Entertainment: Carol Witte, W6WSV; Ruby Word, W6WRT; Ellen Garner, K6EIA.

Monday Entertainment: Mary K. Stewart, W6JMC.

Vocalist: Betty Wilson, W6REF.

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### Keeping Up with the Girls

W1VXC, June, has formed a ten-meter net to facilitate delivery of traffic in Rhode Island. . . . Along with her election as W4 YLRL chairman, W4BLR, Kay, made A-I Operator Club and gave birth to her fourth child (she complained when she fell short of traffic totals required for her third straight BPL). . . . W1VOS, Marge, noted W1s UQA, UBMI, VVS, KN1EIW, and KN2KFB at the New London hamfest. . . . W1SVN, Millie, has joined the ranks of a number of YLs who are policewomen. . . . Four of the girls in W2IQP's training class have passed the Novice exam and are awaiting calls. . . . K2s AHG, DJN, IYP and W2NAI are regular members of the Second Regional 'Phone and Interstate 'Phone Nets. . . . The new address of the YLRL Sixth District chairman, Gertrude Cassady, W6FEA, is 121 Altana St., San Rafael, Calif.

Twenty-three YLs registered at the first YLRL convention in the Fourth District, held in conjunction with the ARRL Southeastern Division Convention. This YLRL meeting was sponsored by the SPARCYS (St. Petersburg Amateur Radio Club YLs). ARRL President Dosland, W0TSN, presented W4JCR, Anita, with a Certificate of Merit, sent to her from YLRL President W6CEE in recognition of outstanding work on the club constitution and her long years of service to the YLRL. Here are the 14 YLs who attended the YLRL breakfast: (standing, l. to r.): KN4CUY, W4s BAV, GNZ, AVA, Minnie Smith, W4s BIL and WPD. (Seated, l. to r.): W4s GJU, UNO, RLG, JCR, TDK, ZVW, HRC.



# • On the TVI Front

## TVI IN GREAT BRITAIN

The Engineering Department of the GPO (Government Post Office) of Great Britain has released recent figures on TVI and BCI in that country. The GPO is the British equivalent of our FCC. Figures shown were extracted mainly from an editorial appearing in the *R.S.G.B. Bulletin* and partly from *The Short Wave Magazine*, British amateur publications.

Interference Caused by Transmitters	
Amateur	Others
BCI — 125	BCI — 142
TVI — 303	TVI — 476

Other TVI offenders were:

- 8956 sewing machines
- 7056 commutator-type motors
- 6954 hair dryers
- 1064 TV receiver local oscillators

The GPO classified 21,877 TVI cases under the all-embracing category "unknown." Also, 6805 instances of BCI were recorded as caused by TV receiver time-base circuits.

## INTERFERENCE COMMITTEE DIRECTORY

The Southern California Electronics Interference Committee publishes "Coöperative Interference Committee Directory." This pamphlet, compiled under the supervision of Ray E. Myers, W6MLZ, contains valuable information for TVI committee members as well as other groups.

To be found in this booklet are three lists. The first is an index of those participating in the program. It gives addresses and also home and office telephone numbers where authorization to do so was received. The second shows the geographic location of the participants. The last is a compilation of the various interests of those taking part.

Also included is an investigation report form. Its purpose is to show sufficient data so as to indicate quickly causes and corrective measures on future reports called to the committee's attention.

## LATEST TVI COMMITTEE LIST

The following is the latest FCC roster of TVI committees. It is interesting to note that since March 1, 1954, 95 new committees have been organized, bringing the total to 437. These committees now serve 412 cities as compared to 328 as of March 1, 1954. Such progress is indeed gratifying and statistics indicate that much credit should be given to those responsible for this accomplishment.

- Alaska:* Anchorage, Fairbanks.
- Alabama:* Anniston, Birmingham, Huntsville, Mobile, Montgomery.
- Arizona:* Phoenix, Tucson.
- Arkansas:* Fayetteville, Ft. Smith, Little Rock.
- California:* Alhambra, Arcadia (2), Bakersfield, Baldwin

Park, Burbank (2), Camarillo, Coronado, Covina, Downey, Dunsmuir, East Bay, Edwards Air Force Base, Encino, Fresno, Fullerton, Glendale, Hayward/San Leandro, Hemet, Inglewood, Lakewood, Lancaster, Long Beach, Manhattan Beach, Marin County, Marysville/Yuba City, Merced, Modesto, Monrovia, Monterey Bay, Mt. Diablo, North Bay, North Hollywood, North Peninsula, Norwalk, Oakland, Orange County, Oxnard, Palo Alto, Pomona/Ontario, Richmond, Sacramento, San Bernardino, San Diego, San Fernando, San Francisco (5), San Mateo, San Pedro, Santa Ana, Santa Clara County, Sonoma County, South Pasadena, Stockton, Taft, Turlock, Ventura, Westchester (in City of Los Angeles), Whittier, Woodland.

*Connecticut:* Darien, New Haven, Norwalk, Norwich, Waterbury.

*Colorado:* Alamosa, Boulder, Colorado Springs, Denver, Grand Junction, Greeley, Pueblo.

*Delaware:* Wilmington.

*District of Columbia:* Washington.

*Florida:* Bradenton, Clearwater, Daytona Beach, Ft. Lauderdale, Ft. Walton Beach, Jacksonville, Key West, Lakeland, Miami, Orlando, Pensacola, Sarasota, St. Petersburg, Tampa, West Palm Beach.

*Georgia:* Albany, Atlanta, Augusta, Hapeville, Macon, Marietta, Savannah, Warner Robins.

*Hawaii:* Honolulu, Hilo, Lihue, Kauai, Wailuku, Maui.

*Idaho:* Boise, Kellogg, Nampa, Twin Falls.

*Illinois:* Alton, Belleville, Berwyn, Broadview, Chicago, Creve Coeur, Decatur, Des Plaines, East Moline, East Peoria, East St. Louis, Freeport, Galesburg, Granite City, Hollywood, Maywood, Moline, Morton, North Riverside, Pekin, Peoria, Princeton, Rock Island, Silvis, Villa Park, Western Springs, Wheaton.

*Indiana:* East Chicago, Elkhart, Evansville, Ft. Wayne, Gary, Hammond, Lafayette, South Bend, Vincennes.

*Iowa:* Davenport, Newton, Spencer, Waterloo.

*Kansas:* Kansas City, Lawrence, Leavenworth, Salina.

*Kentucky:* Lexington.

*Louisiana:* Baton Rouge, Bogalusa, Lake Charles, Monroe, New Orleans, New Orleans (Algiers).

*Maine:* Augusta.

*Maryland:* Annapolis, Baltimore (3), Cumberland, Hagerstown.

*Massachusetts:* Boston, Fitchburg, Framingham, Lowell, New Bedford, North Adams, Pittsfield, Quincy.

*Michigan:* Allegan, Battle Creek, Birmingham, Bloomfield Hills, Detroit, Ferndale, Flint, Grand Rapids, Grosse Pointe, Grosse Pointe Park, Hazel Park, Ishpeming, Lansing, Marquette, Menominee, Mt. Clemens, Mt. Pleasant, Muskegon, Pontiac, Royal Oak, Traverse City.

*Minnesota:* Fairmont, Minneapolis, Red Wood Falls, St. Paul (2).

*Mississippi:* Gulfport, Hattiesburg, Jackson, Keesler Air Force Base, Pascagoula.

*Missouri:* St. Louis.

*Montana:* Great Falls.

*Nebraska:* North Platte, Omaha, Scotts Bluff, Sydney.

*Nevada:* None.

*New Hampshire:* Concord.

*New Jersey:* Atlantic City, Camden, Denville, Livingston, Morristown, Parsippany, Vineland.

*New Mexico:* Albuquerque, Hobbs, Las Cruces, Roswell.

*New York:* Binghamton, Brooklyn, Buffalo, Corning, Elmira, Hornell, Jamestown, Lockport, New York (2), Niagara Falls, Penn Yan, Poughkeepsie, Rochester, Roxbury, Salamanca, Silver Creek, Syracuse, Watertown.

*North Carolina:* Asheville, Charlotte, Dunn, Greensboro, Lumberton, Spindale, Winston-Salem.

*North Dakota:* None.

*Ohio:* Bellaire, Canton, Chillicothe, Cincinnati, Cleveland (6), Columbus, Conneaut, Dayton, Greenville, Middletown, Newcomerstown, Springfield, Wadsworth, Zanesville.

*Oklahoma:* Clinton, Lawton-Fort Sill, McAlester, Ponca City, Tulsa, Wagoner.

(Continued on page 126)

# Results—Armed Forces Day 1955

**A**N Armed Forces Day message to amateur radio operators signed by the Honorable Charles E. Wilson, Secretary of Defense, was transmitted at 25 w.p.m. by military stations AIR, Air Force Radio Washington, D. C., NSS, Navy Radio Washington, D. C., and WAR, Army Radio Washington, D. C., at 1900 EST on May 21st. There were 305 individuals participating in this phase of the special activities of which 233 operators have been mailed certificates of merit in recognition of their making perfect copy.

## Message from the Secretary of Defense

ARMED FORCES DAY IS THE ONE SPECIAL DAY OF THE YEAR DEVOTED TO PUBLIC DISPLAYS AND DEMONSTRATIONS OF THE TEAMWORK AND TECHNOLOGICAL ADVANCEMENTS OF THE ARMED FORCES OF THE UNITED STATES COMMA INCLUDING NOT ONLY THE ARMY COMMA NAVY COMMA AIR FORCE COMMA MARINE CORPS AND COAST GUARD COMMA BUT ALSO THE RESERVE COMPONENTS AND AUXILIARY SERVICES PERIOD AMATEUR RADIO OPERATORS COMMA WHO HAVE WORKED TOGETHER SO EFFECTIVELY IN PROVIDING AUXILIARY COMMUNICATIONS FOR DISASTER RELIEF AND IN OTHER EMERGENCY SITUATIONS COMMA HAVE A PLACE IN OUR NATIONAL DEFENSE SYSTEM PERIOD ACCORDINGLY COMMA ON BEHALF OF THE ARMED FORCES OF THE UNITED STATES COMMA I CORDIALLY INVITE AMATEUR RADIO OPERATORS TO PARTICIPATE IN THE 1955 ARMED FORCES DAY PROGRAM PERIOD SIGNED C E WILSON

Entries were also received from radio operators aboard two ships at sea, French Morocco, Hawaii, Guam and Alaska. Certificate winners are as follows:

W1s OIG BIH AXZ RFC YGV AIJ MIJE JVZ ONP UNC TUI BJP DWO IKE SDO UTH, W2s ALZ JOA MZB JRS WZO NYB DRV CDG JCA FXA ALD TUK QDY LYH CLQ LRW SSC SWC UAP VPH WFL ZMK, K2s WAS ECL DRY GTZ, W3s YWO ADE TSG ZTW JPW ID ZJ OKS QCB JEI BKE AXS ECP FFN PMG QLQ QOJ, W4s IYT KSW SDR KJ MPA RHZ ZPR OFM OXX YTT AQM HRD DEQ PVW CVO LYV PHL SR, K4s BTA/3 ASU, W5s NIY NW NDV HUC LB OFX YOK WNU GPB JPC TGV YMX BI CYE HBD JQU UPM, K5FFR, W6s MBW ZLF DVD MWR OWP QIL CGJ MCY BXL FYW FYN CRT RYR AXV DTY AXQ NAZ ULL YY, K6s CME DSK CFC HSO EJZ NAA, W7s EBS FOS CZY NZP FIX WOK WHE BJY BVZ RML MCU PKX, WN7WYP, W8s ETB RLE QIJ KXN SZU DGI FLA HSW PYB, W9s ANB BA STZ UBW HAC AKP FAM DHJ BP CXY DPL HVP JUJ, W0s TKX CGY FEO EOT QVA UAT PIV WYV NHZ UQM NIY, KG6AFT, KH6s DG FX, KL6JJ, WL7BHC, VE3IA, A2QNND, A7KBV, A9VYD, N3s NCF EAC.

Also C. P. Alexander, M. W. Anderson, Charles A. Armbrust, Wm. J. Beetham, Charles Blake, Richard B. Bradley, Earl L. Brouillette, James R. Burns, Cmdr. C. J. Corrigan, Richard G. Edwards, Maj. Allan C. Forbes, Thomas Galbreath, Lars Giertz, Jim Gilbreath, L. W. Guertin, Gaither M. Hilton, Robert C. Holland, Jack Howell, Dwane O. Howington, Wayne D. Hudson, June

D. Hurst, Edward A. Jones, James R. Manion, Robert H. McChargue, David E. Messiter, Myron L. Morford, Frank J. Moroney, George W. Nervo, John J. Newman, C. T. Nichols, Raymond D. Noren, Thomas A. Olson, Edward V. Phillips, George E. Reynolds, Reinman, Stanley E. Rivett, R. L. Simpson, Frederick W. Staff, I. I. Stokes, E. L. Stough, James G. Tibbetts, G. R. Turner, L. M. Vane, G. R. Walter, George F. Wanish, C. E. Watson, Bernard Weeks, Robert Wixon.

## Military-to-Amateur Test

Operating on military frequencies, AIR, NSS and WAR worked amateurs on the 80-, 75-, 40-, and 20-meter bands. The three military stations made a total of 564 QSOs with amateurs during the six-hour test. Special Armed Forces Day QSL cards have been mailed to all stations worked. It was possible to receive three cards by working all three stations.

## Radioteletypewriter Receiving Competition

There were fifty-two participants in radioteletypewriter competition this year and 27 of this number made perfect copy. A letter of acknowledgment has been mailed to each participant. All suggestions received for improving and creating interest in this phase of Armed Forces Day will be taken into consideration during the forthcoming year.

The Army, Navy and Air Force look forward to your participation in these activities next year on Armed Forces Day.

## STAFF OPENING

We have a permanent opening for a young man to do general editorial and production work on the *QST* staff. Here is a chance to make amateur radio your career. The work requires the ability to express yourself both orally and on paper, and will later involve a modest amount of travel. Any applicant should be one with initiative and should be able to assume administrative responsibility readily.

We'd like someone about 25, preferably single, of pleasing personality, with at least a couple of years of ham experience under his belt; mostly someone who has had some publishing or writing experience. Salary will be commensurate with ability and background.

If you are interested, write to Box 80, ARRL Hq., West Hartford, Conn. State your age and marital status, and give a résumé of your educational and employment or military background; also your amateur experience.

# June V.H.F. Party Summary

## *Scores and Activity Set Many New Records*

PICK any category in which v.h.f. contests can be compared, and the chances are good that the June V.H.F. Party of 1955 will rate a record. The festivities of June 11th and 12th resulted in a new high in participation, with 455 valid entries, compared to a previous record of 370 for any of the spring-fall contests. There were many more portable and multiple-operator stations, as clubs more and more make use of the June Party as a test of Field Day facilities. The advent of Technician licensees on 50 Mc. brought a new surge of life to that band, and the number of operators using 6 was up 60 per cent over last June. More ARRL sections (55) were heard from than in any previous v.h.f. activity, and the scores of both individual operators and groups broke all records.

The highest total ever posted in a v.h.f. contest was turned in by the Waltham Amateur Radio Association, W1MHL/1. Operating from Pack Monadnock Mountain, near Peterboro, N. H., as they have in every party for years, the Watch City club made 97 contacts on 50 Mc., 243 on 144 Mc., 15 on 220 Mc., and 10 on 420 Mc. Their section multiplier, a staggering 43, netted them 16,770 points. Taking their single-band totals, we find them leading the country on 50, 220 and 420 Mc. The 2-meter job of W1PYM, who ran the 2-meter position throughout the contest, was second in the country for 2-meter work. His 3157 points (figured on the basis of 2-meter operation only) was exceeded in that category only by W3IBH.

The top single-operator score was made by W2FBZ, Montclair, N. J. Lee won the Northern New Jersey Section Award again with 233 contacts on 4 bands. Her section multiplier of 34 brought this to 8534 points, another record. Right behind Lee in the home-station category was W1RFU, Wilbraham, Mass., with 211 con-

tacts on 50, 144 and 220 Mc., for 7548 points. W3KKN, Willow Grove, Pa., made the most contacts of any single-operator station, 251 on 6 and 2 meters, for 5522 points. His neighbor, W3IBH, Philadelphia, worked 220 stations in 15 ARRL sections for 3300 points, the country's high one-band effort.

The San Bernardino Microwave Society, W6VIX/6, hung up three marks for groups to shoot at in future contests. Operating from Sierra Peak, near Corona, Calif., they made an even 400 contacts, 306 of which were on 144 Mc., for a new Western record of 6165 points. They used 50, 144, 220, 420, 2400 and 3300 Mc., but they say that this is only the beginning. Their u.h.f. and microwave gear is going to be much more effective for the September Party. Congratulations to operators W6VIX, W6JMY, K6GMV, and K6HXM for demonstrating that a West Coast station can be right up among the leaders, despite the handicap of geographically immense ARRL sections.

Dozens of other portable stations contributed mightily to the fun. K2CMB/2, Paterson, N. J., posted the next to the highest single-operator score, 7714 points, on 50, 144, and 220 Mc. with his trailer station. W3KX/3, the Electric City Radio Club, maintained their customary leadership in the Eastern Pennsylvania Section with 8103 points made on four bands. W1UIZ/1, Mt. Equinox, Vermont, put that hard-to-get section within the reach of many, working 50, 144, 220, 420, and 3300 Mc. His sole contact on 3300 was with W1IUN/1, who used gear built in 1947, with which he made what may have been the first amateur contacts on that band.

Scores of Technicians, using 50 Mc. for the first time in a contest, kept that band jumping with activity. Oddly enough, no Technician qualified for an award, however, as there were no



Members of the San Bernardino Microwave Society operating W6VIX/6 in the June V.H.F. Party made an even 400 contacts on 50, 144, 220, 420, 2400 and 3300 Mc. K6GMV, left, runs the 420-Mc. gear, while K6HXM supervises the 2400-Mc. tests being made by W6JMY. The W6VIX/6 score, 6165 points, was an all-time high for a station outside the small-section East, and their contact total was the highest in v.h.f. contest history.

instances where the necessary three entrants in that category were received from any one section. Note to Technicians: Be sure to show your class of license on future contest reports, and bear down on 6 in the September Party. W1ZW/1, Paxton, Mass., was the country's leading Technician, and the top 50-Mc. operator, as well, with 90 contacts in 13 sections, for 1170 points. This was done without benefit of sporadic-E skip, as the band remained closed throughout the contest, as far as the W1s were concerned.

The 50-Mc. band opened in other areas, however, and some nice scores were turned in as a result. W7OAY/7 knocked off 36 W6s in a 3-hour  $E_s$  session Saturday. Their 1703-point total is believed to be the first 4-digit v.h.f. score ever turned in by a station in the Northwest. They made 129 contacts on 50, 144, and 420 Mc.

A study of the pile of logs brings out many facets of the contest that don't show in the score tabulation. W6OHQ/6, Mt. San Benito, 210 miles northwest of Los Angeles, worked all eight California sections on 144 Mc. K6GVB, Ukiah, Cal., worked 29 stations in four sections, all of which are more than 50 miles distant. Ukiah is in the northern part of California, with mountains in all directions. W2TKO handled emergency traffic for an hour following a CAP crash and breakdown of CAP communications facilities. W3TDF soldered the last connection on antenna systems on his new tower minutes before the start of the contest, and went on to make 203 contacts in 22 sections, for 4466 points. W2UK, taking his last fling at the 2-meter band before dismantling his station for shipment to the Hawaiian Islands, worked 127 stations in 19 sections on 144 Mc. We reported this last month, tentatively, as the best section total made on 144 Mc., but now we find that W2CXY was giving a new 50-element array the acid test in the party and duplicated Tommy's section total.

## SCORES

In the following tabulation, scores are listed by ARRL Divisions and Sections. Unless otherwise noted, the top scorer in each section receives a certificate award. Columns indicate the final score, the number of contacts, the section multiplier, and the bands used. A represents 50 Mc.; B, 144 Mc.; C, 220 Mc.; D, 420 Mc.; E, 1215 Mc. and above. Multiple-operator stations are shown at the end of each section tabulation.

### ATLANTIC DIVISION

#### E. Pennsylvania

W3KKN.. 5522-251-22-AB  
W7TDF.. 4466-203-22-AB  
W3IBH.. 3300-220-15-B  
W3UKI.. 2632-177-16-AB  
W3ARW.. 754-66-13-ABCD  
W3BNU.. 270-54-5-B  
W3EDO/3 132-33-4-B  
W3BRQ/1 120-40-5-B  
W3TPR.. 90-30-3-B  
W3UQJ.. 70-13-6-AC  
W3NCLQ 64-32-2-B  
W3IVM.. 48-16-2-B  
W3WED.. 30-15-2-B  
W3NWE.. 8-5-1-B  
W3RYO/3 5-5-1-B  
W3KX/3<sup>2</sup> (Electric City  
A.R.C.) 8103-202-37-ABCD  
W3OLV/3 (W3s OLV OSA)  
1771-161-11-B  
W3BYF/3 (W3s BYF HPL  
LXM).. 1287-117-11-B  
W3UCA/3 (5 ops.)  
1200-120-10-B

#### Md.-Del.-D. C.

W3CGV.. 1564-89-17-ABCD  
W8NRM/3 936-70-13-ABC  
W3TOM.. 860-86-10-B  
W3WOD.. 684-76-9-AB  
W3GKP.. 592-74-8-B  
W3BNC.. 528-64-8-BC  
W3KMY.. 408-51-8-AB  
W3LZZ.. 300-60-5-B  
W3BYG.. 265-53-5-B  
W3SSF.. 176-44-4-B  
W3OTC.. 174-29-6-A  
W3BBG/W3BBG<sup>1</sup>  
192-32-6-AB  
W3N3CK 152-38-4-B  
W3HQX.. 126-42-3-B  
W3NAEP 120-30-4-B  
W3NH.. 112-28-4-B  
W3YPW.. 108-27-4-B  
W3RQT.. 104-26-4-B  
W3N3NB 51-17-3-B  
W3RRT.. 22-11-2-B  
W3LMC (W3s LMC RQP)  
927-103-9-B  
W3CTQ/3 (W3s CTQ RAH)  
606-101-6-B

#### S. New Jersey

W2RVU/2 3096-125-24-ABD  
W2UK.. 2413-127-18-B  
W2REB.. 1120-12-10-B  
W2CXY.. 1102-68-19-B  
W2ORA.. 477-63-9-AB  
W2HLV.. 320-32-10-B  
W2AF/2.. 240-30-8-A  
W2EAY.. 116-29-4-A  
KN2KFF.. 104-26-4-B  
W2FCC/2 (W2s FCC YJC)  
462-66-7-B  
KN2ITP (KN2s ITP ITQ)  
220-55-4-B

#### Western New York

W2ALR.. 1160-145-8-B  
K2CEH.. 1056-94-11-ABCD  
W2ERX.. 752-47-16-AB  
W2ORI.. 728-104-7-B  
W2WFB.. 612-68-9-AB  
W2ZHI.. 520-10-10-AB  
KN2LRT<sup>1</sup> 396-99-4-B  
W2FCG/2 378-46-8-B  
W2CCR.. 332-83-4-B  
W2ZRG.. 295-69-5-B  
W2OWF.. 275-55-5-AB  
W2ZPB.. 240-16-5-AB  
K2EPV.. 268-67-4-B  
W2TKO.. 240-60-4-AB  
W2ZOC.. 228-57-4-B  
W2LNE.. 183-61-3-B  
W2SHV.. 180-45-4-B  
W2ZPB.. 156-26-4-AB  
K2CVC/2 156-26-6-AB  
KN2JVN/2 156-52-3-B

KN2LRN 144-48-3-B  
W2RHQ.. 116-29-5-ABCD  
K2EJK.. 136-34-4-AB  
K2INO.. 78-39-2-B  
W2QY.. 70-35-2-B  
W2EQO.. 56-14-4-B  
K2CIG.. 50-25-2-B  
W2WIC/2 48-24-2-B  
K2EVP.. 48-24-2-B  
W2ZS.. 46-23-2-B  
KN2KMT 26-13-2-B  
W2UXS.. 36-18-2-B  
K2CUQ.. 17-17-1-B  
W2WIC/2 16-16-1-B  
W1MVF/2 11-11-1-B  
W2UYS.. 10-10-1-B  
KN2INB.. 7-7-1-B  
K2EEC.. 2-2-1-B  
W2UPT/2<sup>2</sup> (4 ops.)  
1854-108-18-AB

W2UFI (Syracuse V.H.F. Club)  
1199-105-11-ABCD  
K2DBB/2 (6 ops.)  
595-85-7-AB  
K2AVI (Northern Chautauqua  
Radio Club)  
188-47-4-B  
W2PST (W2PST, K2CWD)  
111-37-3-AB

#### W. Pennsylvania

W3LNA.. 200-40-5-B  
W3SLU.. 160-32-5-AC  
W3KWH (Steel City A.R.C.)  
416-52-8-AB

## CENTRAL DIVISION

#### Illinois

W9QKM.. 1045-95-11-AB  
W9USL.. 990-78-5-AB  
W9ULF.. 252-63-4-B  
WN9NXI 213-71-3-B  
W9EET.. 210-42-5-AB  
WN9SKE 183-61-3-B  
W9PEN.. 162-54-3-B  
W9GLR.. 142-19-7-B  
W9KLD.. 100-25-4-B  
W9MAK.. 81-27-3-B  
W9KCW.. 44-44-1-B  
W9CYN.. 99-33-3-B  
W9PBN.. 43-21-2-B  
W9HKA.. 9-9-3-B  
WN9NBN (WN9s MHL NBN)  
46-46-1-B

#### Indiana

W9KLR.. 1107-123-9-B  
W9BIY.. 392-56-7-B  
W9BIM.. 116-36-4-B  
W9MHP.. 90-18-5-AB  
W9CWG.. 30-15-2-B

#### Wisconsin

W9BTI.. 747-81-9-ABD  
W9TQC.. 399-56-7-ABD  
W9RNS.. 276-69-4-B  
W9HFL 205-41-5-B  
WN9MQW<sup>1</sup>  
104-26-4-B  
W9GJE.. 100-25-4-B  
W9UJM.. 100-25-4-B  
WN9JCI/W9JCI  
93-31-3-AB  
W9AAX.. 46-16-3-B

W9ILR.. 45-15-3-B  
W9LEE.. 45-15-3-B  
WN9JFP/W9JFP  
W9UZZ.. 16-16-1-B  
WN9MPZ 13-13-1-B  
W9RNL.. 6-6-1-A  
W9MPC.. 6-6-1-B  
W9QXP/9 (W9s OKF QXP  
SEK).. 801-89-9-B

## DAKOTA DIVISION

#### S. Dakota

W9RSP.. 56-14-4-B  
Minnesota  
W9TJF.. 84-12-7-AB  
W9DXY.. 24-8-3-B

## DELTA DIVISION

#### Louisiana

W5HEZ.. 184-23-8-AB

## GREAT LAKES DIVISION

#### Kentucky

W4PCT.. 690-69-10-AB  
W4VLA.. 205-41-5-AB  
W4WNH.. 50-10-5-B  
W4HJQ.. 40-8-5-B

#### Michigan

W8RMH 1534-116-13-ABCD  
W4DXI.. 148-11-13-ABCD  
W8NSH.. 688-86-8-B  
W8ARR.. 320-64-5-B  
W8NOH.. 294-49-6-B  
W8BGY.. 255-51-5-AB  
W8GYU.. 255-51-5-AB  
W8DDG.. 240-41-5-AB  
W8QGP.. 180-60-3-B  
W8OKT.. 162-54-3-B  
VE3ANY/WS  
160-32-5-AB  
W8JXU.. 156-32-3-B  
W8TGH.. 148-37-4-B  
W8JYJ.. 144-45-3-B  
W8DVI.. 105-35-3-B  
W8STTK 93-31-3-B  
W8DUR (4 ops.)  
99-33-3-B

#### Ohio

W8LPD.. 2640-162-16-ABC  
W8IOH.. 1507-133-11-ABCD  
W8SVI.. 968-121-5-B  
W8SFC.. 891-81-11-B  
W8HOK.. 720-80-9-AB  
W8ILC.. 525-105-5-B  
W8SDJ.. 525-75-7-AB  
W8HAN.. 472-58-8-BC  
W8NSVU/W8SVU  
468-52-9-AB

W8RMO.. 456-70-6-ABCD  
W8DRN.. 420-60-7-B  
W8LHA.. 378-63-6-AB  
W8LCY.. 366-61-6-B  
W8JSW.. 348-61-6-AB  
W8CQJ.. 330-55-9-AB  
W8MUE.. 312-52-6-B  
W8BBO.. 305-61-5-B  
W8HUX.. 244-61-4-B  
W8PLQ.. 237-79-3-B  
W8NAF.. 228-76-3-B  
W8IA.. 204-51-4-B  
W8NSMU 204-51-4-B  
W8PKS.. 192-32-6-AB  
W8MIB.. 184-46-4-B  
W8INQ.. 168-23-6-AC  
W8NTLJ 164-41-4-B  
W8NEE.. 150-21-6-AC  
W8VQL.. 148-37-4-B  
W8KDW.. 128-32-4-B  
W8MVA.. 108-36-3-B  
W8WUP.. 105-35-3-B  
W8MKS.. 87-20-3-B  
W8NSUM 72-36-2-B  
W8MDK.. 49-49-1-B  
W8SHY.. 46-23-2-B  
W8PFP.. 38-38-1-B  
W8BOV.. 36-36-1-B  
W8OVC.. 34-34-1-B  
W8OVZ.. 28-28-1-B  
W8IFG.. 24-24-1-B

## HUDSON DIVISION

#### Eastern New York

K2HPN/2 1332-111-12-B  
K2GCH/2 924-76-12-BD  
W2PHX.. 474-79-6-B  
W2PNQ.. 350-50-7-B  
K2GVG.. 252-42-6-B  
KN2KET<sup>1</sup>  
132-33-4-B  
W2BLN.. 60-12-5-B

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# V.H.F. QSO Party

September 17th-18th

Another V.H.F. QSO Party, open to amateurs who can work any band or bands above 50 Mc., will be held from 2:00 P.M. Local Standard Time, Saturday, September 17th, to 11:00 P.M. Local Standard Time, September 18th.

Call "CQ Contest" or "CQ V.H.F. QSO Party" to get in touch with other contestants. During contact, operators must exchange names of their ARRL sections for full credit.

Work as many stations on as many v.h.f. bands as you can. Count 1 point for successfully confirmed exchanges of section information on 2 or 6 meters, 2 points for such QSOs on 220 or 420 Mc., and 3 points on 1215 Mc. or higher bands. To determine your final score, multiply this sum of contact points by your section multiplier, which increases by one when the same section is reworked on another band. A station may also be reworked for credit on additional v.h.f. bands.

A certificate will be awarded to the top scorer in each ARRL section. In addition, a certificate will go to the high-scoring Novice, Technician, and multioperator station in each section from which three or more valid entries in these three special categories are received.

Submit your results as soon as the competition is over. A simple tabulation of stations and sections worked, as shown on page 60 of June, 1953, *QST*, is all that is required. Convenient reporting forms are now available from ARRL.

## Rules

1) The contest starts at 2:00 P.M. Local Standard Time, Saturday, September 17th, and ends at 11:00 P.M. Local Standard Time, Sunday, September 18th. All claimed contacts must fall within this period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation.

2) Name-of-section exchanges must be acknowledged by both operators before either may claim contact point(s). A one-way exchange, confirmed, does not count; there is no fractional breakdown of the 1-, 2- or 3-point units.

3) Fixed-, portable- or mobile-station operation under one call, from one location only, is permitted. A transmitter used to contact one or more stations may not be used subsequently under more than one other call during the contest period.

4) Scoring: 1 point for completed two-way section exchanges on 50 or 144 Mc.; 2 points for such exchanges on 220 or 420 Mc.; 3 points for such exchanges on the higher v.h.f. bands. The sum of these points will be multiplied by the number of different ARRL sections worked per band; i.e., those with which at least one point has been earned. Reworking sections on additional bands for extra section credits is permitted. Cross-band work does not count. Contacts with aircraft mobile stations cannot be counted for section multipliers.

5) A contact per band may be counted for each station worked. Example: W2GLV (S.N.J.) works W1DBM (Conn.) on 50, 144 and 220 Mc. for complete exchanges. This gives W2GLV 4 points (1 + 1 + 2) and also 3 section-multiplier credits. (If W2GLV contacts other Connecticut stations on these bands, they do not add to his section multiplier but they do pay off in additional contact points.)

6) Each section multiplier requires completed exchanges with at least one station. The same section can provide another multiplier point only when contacted on a new v.h.f. band.

7) Awards: A certificate will be awarded to the high-scoring single-operator station in each ARRL section. In

addition, the high-scoring multiple-operator station will receive a certificate in each section from which three or more valid multiple-operator entries are received. Certificates will also be given to the top Novice and Technician in each section where three or more such licensees submit logs. Award Committee decisions will be final.

8) Reports must be postmarked no later than October 5, 1955, to be eligible for awards. See the box on page 60, June, 1953, *QST*, for correct form, or a message to Headquarters will bring a lithographed blank for your contest report.

# W/VE Contest

September 24th-25th

The annual W/VE Contest, sponsored by the Montreal Amateur Radio Club, will be held from 6 P.M. EST, September 24th, to 11:59 P.M. EST, September 25th. The rules are the same as those of last year. Amateurs in the U. S. A. will be trying to trade contest exchanges with as many Canadians in as many provinces and territories as possible; VE/VO stations will



"Forwarded annually to the highest point scorer (in the W/VE Contest) to foster and promote increased radio communication activity between amateurs in the United States and Canada," is the inscription on this handsome trophy donated each year by Emerson Radio of Canada, Ltd. Winner in 1954 was VE6VK.

be searching for amateurs in the ARRL sections in the U. S. A. A sample message, as originated by a W6 in Los Angeles section, might appear as follows: NR 1 W6XXX 579 LA. VE2BB, MARC contest chairman, urges participants to read the rules carefully and maintain neat logs so that the results can be presented quickly and accurately.

## Rules

1) Any station located in any ARRL section as listed in *QST* (page 6) is eligible to enter.

2) All contacts must be made during the contest period from 6:00 P.M. EST, September 24th, to 11:59 P.M. EST, September 25th, with a total of no more than 20 hours operating time for each entry. Times on and off the air must be clearly shown in the contest log.

3) Exchanges such as the following must be exchanged and be fully recorded in the log entered: (1) number of

(Continued on page 114)



CONDUCTED BY EDWARD P. TILTON, WIHQ

WHEN 2-meter DX beyond 1000 miles or so is worked, a discussion usually follows as to the mode of propagation. Was there a reflection from an ionospheric layer, 50 miles or more above the earth, or did the signal follow earth curvature throughout the route as the result of favorable conditions in the lower atmosphere? There seems little doubt that both modes have produced DX on 144 Mc., but the distances over which they make communication possible overlap to some extent.

For a time the possibility of ionospheric DX on 144 Mc. was questioned, but several examples of long-distance work seem to have been of this nature. One of the first was the 1200-mile contact between W8WXV and W5VY, in June, 1950. This came at a time when the 50-Mc. band was boiling with sporadic-E skip, and weather conditions along the path were not such as to encourage tropospheric propagation. In June a year later a whole string of Texas-California contacts were made. W6ZL and W5QNL set the 1400-mile record that still stands, but several other stations worked similar hops only a few miles shorter. Here again, the 6-meter band was going strong, and there was extensive thunderstorm turbulence along the route that would appear to rule out tropospheric propagation.

On the other hand, just about every September we have one or more 2-meter openings of major proportions when there is no evidence of sporadic-E skip on lower frequencies. The W2BAV-W0DSR contact of September, 1950, was in the 1200-mile range, and W2BAV was heard out to more than 1400 miles on that occasion. There have been contacts beyond 1000 miles under similar conditions every fall since. The question then arises, how to tell when favorable conditions for 2-meter DX exist, whether for  $E_s$  or tropospheric propagation?

Often during the early summer DX season on 50 Mc. we hear 6-meter stations arranging checks on 2. Practically all of these fail, but once in a blue moon one pays off. Such a check by W5AJG, Dallas, Texas, started the 1951 session with

stations in the Los Angeles area. Leroy did it again on July 3rd of this year; this time with W7LEE, Parker, Ariz. They worked on 6 and then changed to 2 at 1242 CST, continuing the contact successfully on c.w. on the higher band. The 144-Mc. c.w. signal of W5AJG was heard by W7JU, Boulder City, Nev., at this time. W5AJG made similar checks with W5LFH, Sandia Park, N. Mex., and W4CVQ, Raleigh, N. C., without success. The following day W7LEE heard unidentified 2-meter signals from the East again.

The W5AJG-W7LEE path is about 1020 miles, which we suspect is near the minimum over which  $E_s$  work is likely to be done on 144 Mc. W5LFH, under 600 miles, was undoubtedly too close. W4CVQ is about the same distance as W7LEE, but ionization density was probably greater on the western path. W5LFH and W5SFW, Amarillo, Texas, worked on 50 Mc. that day, with both beams aimed west. As they are only 220 miles apart, a high-density cloud to the west is indicated.

In looking for 2-meter DX prospects on 6, we should not be fooled by extremely strong signals on the lower band at 500 to 1000 miles. A wavy signal on 6 at 1200 miles might be a

◆  
New array on the way up at VE3DIR, Toronto. Two years of planning went into this "nest" of 20-element arrays for 144, 220 and 420 Mc. The steeplejack is W2ALR.  
◆





W2QCY/7 in operation on 50 Mc.  
near Wendover, Utah.

much better bet, especially if signals much closer in are heard at the same time. If 50-Mc. stations under 300 miles away are heard by the ionospheric route (that is, during a hot opening, with signals showing  $E_s$  characteristics) there may be a chance of 2-meter work over much longer hauls. But don't waste much time making tests with some big-signal 6-meter man 700 miles away under such circumstances; your best prospects will most likely be beyond 1100 miles distant. And they will be south of Winston-Salem, Nashville, Tulsa, the Grand Canyon, and San Francisco, if past experience in this department means anything.

The chances for sporadic-E DX on 144 Mc. will be slim until early next summer, but the fall tropospheric DX season will be just getting under way by the time this issue is mailed. This kind of DX knows no geographical bounds, in the early fall, at least. A close watch of nationwide weather conditions and frequent monitoring of TV Channels 7 to 13 (with a good receiver and high-gain antenna system) will provide the best indications of the possibility of DX on 144, 220 and 420 Mc. during this season. The lower TV channels and the amateur 50- and 28-Mc. bands are of little help in establishing one's chances for v.h.f. DX during the fall months.

### 50-Mc. Expeditions Pay Off

A 6-meter bull session last February resulted in one of the most pretentious expeditions ever organized for the purpose of providing v.h.f. DX contacts. The laments of New Jersey 50-Mc. operators over the lack of Utah and Nevada contacts on 6 gave W2QCY an idea for a 1955 vacation trip. At least one East Coast 50-Mc. WAS resulted, and scores of calls all over the country were moved one or two more rungs up the WAS ladder.

Planning of the expedition began at once, and from February to June, W2QCY did little else but build and test equipment and scout prospects for driving and operating assistants for the 5000-mile jaunt. A new 50-Mc. home rig was in the planning stages, so the expedition set-up was built in de luxe form, to serve as a permanent home station later on. The result was a transmitter delivering 50 watts output on either c.w. or a.m. 'phone, equipped with gang-

tuned VFO and following stages, speech clipping and filtering, and all metering and operating features necessary for convenient and effective use; yet built in compact enough form to permit installation in Roy's panel truck.

A recruiting program that included mention of the advance plans for the trip in these pages, and much on-the-air talk, was launched early in the spring. It was not easy to find two men who could take the time to make a trip of this sort, though scores of fellows felt the urge. The first likely prospect turned up was Erret "Reb" Allen. His license had lapsed some time ago, but his interest in ham radio was rekindled by talk of the trip. In three weeks he had passed his General Class exam, and as K2ODA became a definite member of the Project Utah staff. The third member, George Whattam, W2CZE, was signed up almost at the last moment.

The cab of the 1949 Dodge panel truck was equipped with reflective-type insulation, and the roof given two coats of chrome paint, in anticipation of desert heat. An operating table was installed in the truck compartment, and all gear readied for use. Luggage carriers on the roof took care of the nine 10-foot TV mast sections and the Telrex 6-element array. Gear for use on 7, 14 and 21 Mc. was installed. Test runs were made, with all gear and operators, to determine their suitability for the job coming up. Letters had been written to several W7s for advice and assistance, and the approximate location was selected for the Nevada-Utah operating.

The expedition left Morristown, N. J., the night of July 17th, and by the morning of the 20th they were ready for a rendezvous with Andy Norgaard, W7UPS, Wendover, Utah! Sites were surveyed and Three-Mile Hill, a mountain just over the state line in Nevada, was selected for the first work. Between then and June 26th, 59 different stations were worked, winding up the Nevada stay with a fine double-hop opening Sunday, the 26th. Eastern stations worked included W3s PCB, MQU, HFY, FPH, W2s MEU, ZKE, KNQ, 1DZ, WCM, UQQ, and K2s BDF and JNS. Contacts were made at the rate of one every 90 seconds through terrific QRN.

The scene of operation was shifted to a saddle between two peaks NNE of Wendover, Utah, on the 27th, from which point 26 stations were raised. Conditions were never so favorable during the three days left for Utah work, and only two eastern stations were worked: W1VNH and W2IDZ. The latter made possible the first 50-Mc. WAS award to a W2. W2IDZ's Certificate No. 11 is the second to be issued to an operator located east of W9. Special QSLs are being prepared and will be sent to all stations worked.

While W2QCY/7 was busy in Nevada, another Nevada expedition very similarly equipped was making hay in Las Vegas. The night of June 26th, W6ABN/7 worked some of the same stations as W2QCY/7, but in addition, many W1s, most of whom had never heard a Nevada signal before. Stan used 100 watts input to an 829B, and a 4-element array mounted about 10 feet above his panel truck. Though he spent most of a three-week vacation in Las Vegas, it was only between June 24th and July 4th that many contacts were made. In this time W6ABN/7 worked 115 different stations in 27 states, all call areas, and VE3. VE3AET, the sole Canadian worked by W6ABN/7, reports that he also worked W6COH/7, near Jean, Nev., on June 25th.

The work of these stations demonstrates that only activity is needed to make any state in the country available to any other on 50 Mc. This is supported by the work of W7JPN, Salt Lake City, and W7QDJ, Clearfield, Utah, who worked many stations throughout the East during July openings. These two are the first Utah home stations to work double-hop sporadic-E DX, and as such they pro-

# 50 WAS Mc.

W0ZJB.....48	W5VY.....48	W9ZHB.....48
W0BJV.....48	W5FW.....47	W9QUV.....47
W0CJS.....48	W5GNQ.....46	W9HGE.....47
W5AJG.....48	W5ONS.....45	W9PK.....47
W9ZHL.....48	W5JTI.....44	W9VZP.....47
W9OCA.....48	W5ML.....44	W9RQM.....47
W6OB.....48	W5FSC.....44	W9ALU.....47
W0INI.....48	W5JLY.....43	W9QKM.....46
W1HDQ.....48	W5JME.....43	W9UIA.....45
W5MJD.....48	W5VV.....42	W9UNS.....45
W2DZ.....48	W5EAL.....41	W9NFIH.....36
W1LLL.....48	W5HEZ.....41	
	W5HLD.....40	W0DZM.....48
W1GJO.....47	W5FXN.....38	W0QIN.....47
W1CLS.....46	W5LIU.....37	W0NFM.....47
W1CGY.....46		W0TKX.....47
W1LSN.....45	W6WNN.....48	W0KYF.....47
W1DJ.....41	W6ANN.....45	W0HVV.....47
W1RFU.....41	W6TMI.....45	W0WKB.....47
W1FOS.....32	W6IWS.....41	W0JOL.....46
	W6ABN.....35	W0MVG.....46
W2MEU.....47	W6CG.....35	W0TJE.....44
W2AMJ.....46	W6BWG.....30	W0URQ.....44
W2BYM.....46		W0JHS.....43
W2RLV.....45	W7HEA.....47	W0PKD.....43
W2FHL.....44	W7ERA.....47	W0IPI.....41
W2QYV.....40	W7BQX.....47	W0ORE.....37
W2QVH.....38	W7DDJ.....46	W0EKY.....32
W2ZUW.....36	W7DYD.....45	W0USQ.....30
	W7JRG.....44	
W3OJU.....46	W7ACD.....43	VE3AET.....44
W3NKM.....41	W7BOC.....42	VE3ANY.....42
W3TIF.....39	W7JPA.....42	VE1QZ.....34
W3MQU.....39	W7WV.....41	VE3AIB.....32
W3OTC.....38	W7CAM.....40	VE1QY.....31
W3KMY.....38		VE3DER.....27
W3RUE.....37	W8NSN.....46	XEIGE.....25
W3FPH.....35	W8NQD.....45	C06WW.....21
	W8UZ.....45	
W4FBH.....46	W8RFW.....45	
W4EQM.....44	W8CMS.....45	
W4QN.....44	W8SSQ.....43	
W4CPZ.....42	W8LPD.....42	
W4FLW.....42	W8YLS.....41	
W40XC.....41	W8OJN.....40	
W4MS.....40		
W4FNR.....39		
W4IUI.....38		
W4REN.....35		

Calls in bold face are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.

vided many operators with their first Utah contacts. Among the beneficiaries was W1LLL, Windsor, Conn., who worked both for No. 48 on July 16th. One of the country's most consistent 50-Mc. DX hounds, Brownie had been watching for Nevada and Utah constantly for several years. He now holds 50-Mc. WAS Award No. 12.

## Here and There on the V.H.F. Bands

As frequently happens in peak v.h.f. months, a tremendous volume of mail reached your conductor's desk during July. We'll sift it carefully and report interesting tidbits in briefest possible form.

Miles-per-watt record on 50 Mc? On July 10th W2IDZ asked a W4 to look for his transistor oscillator rig, announcing the frequency. The station with whom the test was made did not hear the flea-power signal, but W4QN, Orlando, and W4AYV, Umatilla, Fla., did. Both called Ed to let him know that the 3.6 milliwatts of output had produced readable c.w. signals. Ed figures this as something around 263,000 miles per watt. The rig, built by W2JEP,

W7UPS at the operating position of W2ACY/7. Complete station was designed for the trip from Morristown, N. J., to Utah and Nevada.

has also been used by W2QCY/2, Greenwood Lake, N. J., to work 40 miles on 6-meter ground wave.

It pays to check 6 noontimes if you can. W1VNH, Agawam, Mass., worked W2QCY/7, Utah, during a noon opening when no other signals were audible. He was the only W1 worked during the entire W2QCY expedition.

The trip to Utah and Nevada was so much fun that a Labor Day trip to West Virginia is being planned by the same W2QCY crew. Advance surveys were made, so that the whole week end can be put to best use in providing 50-Mc. contacts with that hard-to-get state. W2QCY/8 will be on about 50.2 Mc. from a high point near Martinsburg, about 20 miles southwest of Hagerstown, Md.

Examples of the big pick-up in 50-Mc. activity: Tennessee stations are heard whenever the band is open in that direction. W4ZBQ says that there are 27 stations on 50 Mc. in the Knoxville area alone. W5HEZ, Baton Rouge, La., worked 85 different stations in one day recently. W1VNH counted 27 Ohio W8s during a July session. W6s by the score have been heard in the East during the better double-hop openings. W8CMS worked 20 states, 8 call areas, July 9th. VE3AET heard or worked 56 stations in 16 states, June 26th. Fifteen-minute tape recording made by W1HDQ on June 26th has 35 different calls in 17 states in evidence. W7OAY/7 worked 36 W6s in the June V.H.F. Party. W0ZJB worked 44 stations in 24 states and all call areas, July 8th.

This brings on a considerable QRM problem, with everyone trying to use the low end of the band. With sparse occupancy of the band, concentration on the first 100 kc. did no great harm, but there just isn't room for everyone there any more. Stations in Channel 2 areas need to work as low in the band as possible, to minimize TVI. W2IDZ suggests that where Channel 2 TVI is not a problem, 6-meter men take it upon themselves to move up in the band, at least during widespread openings. And all of us should tune more of the band than we do. Your conductor, using 50.57 Mc. for mobile work of late, has lost plenty of calls because fellows don't tune that high, even when the band is dead. Too many operators run up to about 50.4 Mc. and give up. Let's use more of it, boys!

That last state for W0DZM, Robbinsdale, Minn., was not Nevada or Utah, but Montana. He nailed this one down with W7JRG, Billings, Mont., July 15th. When that last card comes through, Shorty will be in line for Award No. 13. All 48 were worked with 30 watts input to an 815, which may be the low-power record for 50-Mc. WAS. Two near-misses: W0TKX, who missed the shot at W2QCY/7 and W6ABN/7 by being out on Field Day, and W9VZP, who raised W6ABN/7 just as Stan developed transmitter trouble and couldn't reply.

Six-meter oddity: W8WVP finished his rig and installed his antenna system on July 9th. His first CQ on 6 raised W5ZVF, who had also just finished erecting a beam and putting his station in order in a new location, making his first transmission in calling W8WVP. It was the first Michigan contact for W5ZVF, and the first Arkansas contact for W8WVP.

W0ZJB, Wichita, Kan., suggests the possibility of an out-of-this-world 2-meter net that could be put into service



by using high TV towers during the station's off-the-air hours. TV transmitting arrays are broadband affairs. They are several hundred feet higher than any ham is likely to get his antenna, and they're fed with low-loss lines. They may not have the best match in the world for 144 Mc., but even with a high s.w.r. (who's worrying, at amateur power levels?) they still do quite a job on 2. W5DFU and W5VKH have used a 600-foot tower for Channel 8 at Muskogee, Okla., on several occasions. W5IOW has worked Mississippi, Oklahoma, Texas and Kansas with fine signs on the Channel 10 array at Ada, Okla. Vince now plans to use the Channel 10 array of KAKE, Wichita, the night of Sept. 10th, and the following morning. He will be on 144.32, and would like to have as many fellows as possible keep a sharp lookout for W0ZJB/0 at that time.

This should be something for some of the members of the "Flashlight Net" reported by W3KCA, Greenmount, Md. These are hams who work at radio and TV stations, and consequently cannot be on the air during the popular evening hours. W3s HFG OWV QFM OLR YPL BJG SST KCA and YQO cannot be on the air before 0100. They hold forth each morning until 0300 or later, and invite others to join in. They use 145.62 Mc. for a net frequency, but look for other callers regularly.

VE3DIR, Toronto, is another all-nighter. Tony gets home late and has a tough time making contacts on 144 Mc. He calls CQ to the west at 0100, but usually finds it a lonely proposition.

A midnight watch is kept each Saturday on 50 Mc. by the Royal Order of Hootows, of Seattle, Wash. W7YJE has a certificate available to any 6-meter operator who will join their hooting on 6 for one hour beginning any Saturday at midnight. Net frequency is 50.4 Mc., and charter members are W7s YJE TMU VIC UFE and VMH.

South Carolina has been beyond the horizon for 2-meter men of the Eastern Seaboard, so it looked like a good place to spend a vacation to W2FBR and W2FBZ. Accordingly, they set out for two weeks at Myrtle Beach, S. C., in June. Using a 6146 rig and a 24-element portable array, Ralph and Lee operated on 2 from June 20th to July 1st, providing first South Carolina contacts for W4s in North Carolina and Virginia. No South Carolina stations were heard, though contacts were made regularly with W4CVQ, Raleigh, K4AMX, Winston-Salem, W4MDA, Wilmington, W4NTQ and W4SMA, Whiteville, and other North Carolina stations. On June 30th they worked W4s IKZ OLK VVE ZBU and SCJ in the area around Norfolk, Va., about 280 miles to the north. Skeds were kept each morning with W1HDQ and others, but there was no real band opening to the north during their stay, so no DX was worked. Just a few nights previous to the arrival of W2FBR/4, the North Carolina stations had a field day with W1s and 2s on 144 Mc!

A new mountainous path broken down on 144 Mc. W7UVH, Olympia, Wash., writes that he and W7PVZ, and W7LHL, Seattle, now work W7HEA, Toppenish, Wash. This is only about 130 miles in each case, but the Cascade Range intervenes. Big antennas (horizontal) and improved receivers seem to be major factors in breaking down this circuit. We showed W7LHL's 96-element array last month. W7UVH has a 24-element job composed of six 4-element Yagis.

VE7FJ, New Westminster, B. C., works into the Portland area, 260 miles to the south, when conditions are good. Using horizontal polarization he has connected with W7s SEZ, NNR and OKV. Art would like to see a "v.h.f. circuit of the month" in each issue of QST. So would your conductor. We'll be glad to run information on any novel ideas you fellows care to send in, as we have in the past. We need more material to make it a regular thing, however.

Anyone for Bermuda on 144 Mc.? VP9BM is all set and will keep schedules. He is on 144.35 Mc. VP9AY, who was making contacts on 50 Mc., has left Bermuda and is now on duty at Selfridge Field, near Detroit. VP9BM will keep skeds on 20, for checks on 2. Address: M/Sgt. J. W. Wen-glare, 1934 AACs Sqdn., APO 856, New York, N. Y.

## September V.H.F. Party Coming Up

Elsewhere you'll find the announcement of the regular fall v.h.f. contest. Note two minor changes in the rules for this and subsequent contests. Because of the difficulty in establishing the exact location, and the ease with which they move from one section to another, contacts with aircraft stations are ruled out henceforth for section credits. All

## 2-METER STANDINGS

Call			Call		
States	Areas	Miles	States	Areas	Miles
W1RFU...	19	7 1150	W6DNG...	4	2 350
W1HDQ...	19	6 1020	W6ZL...	3	3 1400
W1CCH...	17	5 670	W6BAZ...	3	2 320
W1IZY...	16	6 750	W6NLZ...	3	2 360
W1UIZ...	16	6 680	W6MMU...	3	2 240
W1IEO...	16	5 475	W6GCG...	2	2 310
W1KCS...	16	5 600	W6QAC...	2	2 200
W1AZK...	14	5 650	W6EXH...	2	2 193
W1MNF...	14	5 600			
W1BCN...	14	5 650	W7LEE...	5	3 1020
W1DJK...	13	5 520	W7VMP...	5	3 417
W1MMN...	10	5 520	W7JUL...	4	3 247
			W7YZU...	3	2 240
W2ORI...	23	8 1000	W7JUC...	3	2 140
W2NLY...	23	7 1050	W7RAP...	2	1 165
W2AZL...	21	7 1050			
W2QED...	21	7 1020	W8WVX...	28	8 1200
W2BLY...	20	7 910	W8LPD...	23	8 —
W2OPJ...	19	6 —	W8SVT...	23	8 725
W2DWC...	18	6 632	W8RMH...	22	8 690
W2AOC...	18	6 660	W8DX...	22	7 675
W2UTH...	16	7 880	W8SRV...	20	8 850
W2PAU...	16	6 740	W8WRN...	20	8 670
W2PCQ...	16	5 650	W8BAX...	20	8 685
W2LHI...	16	5 550	W8JVV...	19	8 710
W2CFT...	15	5 325	W8EP...	18	7 800
W2DEF...	15	5 —	W8ZCV...	17	7 970
W2AMJ...	15	5 550	W8RWW...	17	7 630
W2BRV...	14	5 590	W8WSE...	16	7 800
W3RUE...	23	8 950	W9EHX...	24	7 725
W3KCA...	21	7 —	W9FVJ...	23	8 850
W3NKM...	19	7 660	W9BPV...	23	7 1000
W3IBH...	19	7 650	W9EQC...	22	8 820
W3BNC...	18	7 750	W9KLR...	21	7 690
W3FPH...	18	7 —	W9UCH...	21	7 750
W3TDF...	18	6 720	W9ZHL...	21	7 —
W3FWL...	16	7 720	W9KPS...	19	7 660
W3LNA...	16	7 720	W9MUD...	19	7 640
W3GKP...	15	6 800	W9REM...	19	6 —
			W9LF...	19	—
W4HHK...	26	8 1020	W9ALU...	18	7 800
W4AO...	23	7 950	W9GAB...	18	7 750
W4PCT...	20	8 —	W9GJA...	18	6 720
W4JFV...	18	7 830	W9GKA...	17	6 600
W4MKJ...	16	7 665	W9MBI...	16	7 680
W4UMF...	15	6 600	W9BOV...	15	6 —
W4OLK...	15	6 720	W9LEE...	15	6 780
W4OXC...	14	7 500	W9DSP...	15	6 760
W4JHC...	14	5 720	W9JNZ...	15	6 580
W4WCB...	14	5 740	W9DDX...	14	6 790
W4TCR...	14	5 720	W9FAN...	14	7 660
W4UBY...	14	5 435	W9QFM...	14	6 620
W4IKZ...	13	5 720	W9JJI...	13	6 560
W4JFU...	13	5 720	W9UIA...	12	7 540
W4TLV...	13	5 700	W9ZAD...	11	5 700
W4UDQ...	11	5 850	W9OTA...	11	5 540
W4ZBU...	10	5 800	W9JBF...	10	5 760
W4WNH...	10	5 500			
W4HJQ...	10	4 500	W0EMS...	26	8 1175
W4MDA...	10	4 680	W0IHD...	24	7 870
			W0GUD...	22	7 1065
W5RCI...	21	7 925	W0ONQ...	17	6 1090
W5JTL...	19	7 1000	W0ICI...	14	6 830
W5AJG...	12	4 1260	W0OAC...	14	5 725
W5QNL...	10	5 1400	W0TJF...	13	4 —
W5CVW...	10	5 1180	W0ZJB...	12	7 1097
W5ABN...	10	3 780	W0WGG...	11	5 760
W5MWW...	9	4 570			
W5ML...	8	3 700	VE3A1B...	20	8 890
W5ERD...	8	3 570	VE3DIR...	20	7 790
W5FEK...	8	2 580	VE3BQN...	14	7 800
W5VX...	7	4 —	VE3DER...	13	7 790
W5VY...	7	3 1200	VE3BPB...	13	6 715
W5ONS...	7	2 950	VE3OK...	12	5 550
W5ESC...	7	2 500	VE3AQQ...	11	7 800
			VE1QY...	11	4 900
W6WSQ...	5	3 1380	VE7FJ...	2	1 365

moving stations have been excluded from competition by the rules for some years, though many provide contacts for participants, and we hope that they'll continue to do so. But if you work an aircraft over a section you don't catch with a ground station, you can't count the section hereafter. Makes it fairer for everyone, we feel.

Another change has been made, to bring v.h.f. contest rules into conformity with the Field Day rules, and to prevent excessive numbers of contacts with a single piece of equipment. A rig used to make one or more contacts in the contest can be used thereafter under only one additional call. You work from home with a Communicator, say. Then you can go out and work from a portable location with the same rig. That's legal and logical so far. But your wife (or girl friend or anyone else who is licensed) cannot then take the rig and make more contacts under another call. This is designed to prevent "manufactured" contacts, and to make the contest results a more accurate indication of the extent of v.h.f. activity in any area.

And here's some advance information on events scheduled (Continued on page 122)

# How's DX?

CONDUCTED BY ROD NEWKIRK,\* W9BRD

## However:

Amateurs who joined the countries race within the past four years find themselves at a certain disadvantage with respect to their OT competitors in DX ranks. The U.S.S.R. portions of their ARRL DXCC Countries List check-off sheets are bare as Mama Hubbard's celebrated cupboard. It's indeed difficult for the new school to visualize how plentiful and workable those U signals were during years immediately following World War II.

Anyway, around 1951 they stopped coming back. At the same time receipt of QSLs from Russian stations dwindled to zero. That is the situation generally maintaining today. Stations bearing U.S.S.R. amateur prefixes, while quite frequently heard, work only each other and satellite-country stations<sup>1</sup>—except in curious and isolated instances. An increase in these rare exceptions to the rule is what prompts Jeeves to bring things up to date by recording here the status of 1955 DXing with respect to the Iron Curtain.

Beginning last year UB5s in the Odessa area began QSOing and QSLing on a modest world-wide basis. Other U stations now give scattered comebacks but deliver no QSLs. This may establish a trend but the pattern still is too vague to be much of a pattern. A spot-check of the "How's" mailbag turns up the following Russian call signs logged in North America on 20- and 40-meter c.w. during the past several weeks:

UA1s CF DH KAE KAI KAQ KFA KIA KJA RF TT, UA3s AF CR DH EG FE KAF KBD KET KMB KWA MP TV, UA4s HI KCE KKC KPA KV, UA6s KAB KOB, UA9s CM DH KOG KQB, UA9s KAD KCA KCI KKB KOA KOH SJ, UB5s BP CF CI CR KAA KAB KAC KAD KAG KHE, UC2s KAB KAC KBC, UD6s KAB KAD, UF6KAF, UG6AL, UI8KBA, UJ8KAA, UM8KAA, UN1KAA, UO5s AA KAA, UP2s AA KBC, UQ2s AN KAA, UR2KAA.

Some have swapped reports with stations outside the Curtain. A few have produced QSLs. These U stations, almost invariably multi-operator manned, usually are heard working each other in periodic organized activities. Their ripply signals are generated by gear which apparently is on a par with U. S. ham equipment of the 1930s. Their operating technique, however, is

\* Please mail all reports of DX activity to DX Editor Newkirk at 4128 North Tripp Ave., Chicago 41, Illinois.

<sup>1</sup> Satellite-country stations bearing amateur prefixes—DM HA LZ OK SP YO, etc.—continue limited world-wide activity, QSOing both sides of the Curtain. In Albania and Red China ham radio in any form appears to be nil. See "Whence" for info on the licensing structure in a typical satellite country.

capable; fast break-in and 30-w.p.m. code speeds are common.

Beyond the preceding evidences Churchill's descriptive "riddle wrapped in a mystery inside an enigma" easily still includes Russian amateur radio. That chink we now perceive in the radio Curtain is neither extensive nor is it necessarily permanent.

— — —

The DX contest season is upon us! Brazil's annual LABRE affair comes off early this month (see p. 126, August QST) and DARC of Germany throws its WAE Test (see "Whence") shortly thereafter. In October the VK/ZL show will take the stage. *Battle stations!* . . .

## What:

A general call to quarters, too, for our yearly African DX hunting season. "Ye'll take the long path and I'll take the short path and the W6s will be in Kenya before us," as the GMs oft lament to each other. Anyway, our DX bands will see the Dark Continent boiling through with excellent openings—even 10 meters is slated to join the party now and then.

**20** c.w. bears the brunt of late summer activity, as usual. W9UKG bagged EA9AP (14,013 kc.) 23 GMT, FF8AC (22) 21 FY7YF (61) 1, GC3KAV (78) 0, GD3UB (12) 0, HA5BL (41) 22, KJ6BG (97) 6, OA4J (27) 3, OX3AY (12) 4, SP5AR (68) 4, VO3FN (82) 22, ZP5AY (65) 1, 9S4s AR (36) 21 and AX (7) 22. Doug still is after F9YP/FC (18) 21, OD5AF (74), SU1IC 0, a YJ1 and ZD9AA (58) 21. In the joker department W9UKG nominates PX1 FUS FC7 HZ2 and CU2 psychos. — — — W6QPM climbed to 144 by way of FM7WF (45) 23, IS1AIHK (10), Turks' VP5DC (75), XZ2AD (60),



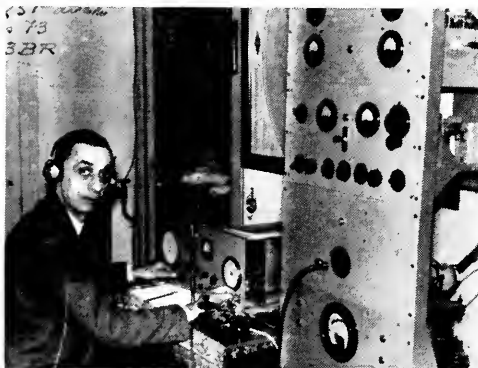


YJ1DL (5-10) 7, YS1O (50), ZD6BX (55) 12-13 and 3V8AB (55) 12-13. W10JR captured FASRJ (82) 6, IS1CXF (70) 3, LZs 1KSP (78) 1-2, 2KSK (50) 9, OK1XM (30) 10, UQ2AN (25) 8, VQ6LQ (85) 9-10, W6OXS/VP2, ZD3A (70) 3 and ZP5GM (25) 1. Vic and others wonder what gives with this ZP6CR, RCP (Uruguay) says there ain't no such animal and yet he's been at it for years. K2GMO climbs aboard our Bandwagon with CR4AL (15) 20, FF8AJ (68) 21, JAs 1ACA 1KW 2BL 3AF 3BP 5AB 6AA 6AD 6AO 6HK 8AA 8AI 8AQ, KAs 2CR 2KS 5IM, KG6NAB (81) 10, KT1EXO (92) 19, LZ1KAB (21) 2, UB5KAA (54) 13, VQ4FM (20) 4, a VQ6, a ZD3, ZP9AU, 4X4s DR (96) 22, FK (18) 22, FQ (90) 22, IE (76) 22 and others. DM2ABL 20, FQ8AC (70) 7, JAs 1KM 2AT, KA2NA 7, T2FWAF 20, VK9AU (25) 7-12 and YN1PM (5) 2 worked W7TML in good style. W5WZQ sends Texas QSLs to folk like CR9AI 13, DU1CV (80) 13, EA8BP (35) 0-3, FF8CG, FG7XB (64) 3, FK8s AE 6, AH (64) 8-15, AL 7, FM7WP (27) 23, FQ8AK (64) 6, FY7YE (60) 13, GC2ASO, a GD3, HPIEH, 11s BLF and BNU (25) 3 of Trieste, a KJ6, KR6s LJ (40) 13-14, MC OL, ST2NG 4, an SU1, VPIFL (70) 15, VP5BM of Turks (45) 18-19, a VQ6, VR2AR (9) 3-4, VSs 1FS (78) 13, 1GL (36) 14, 1GU 12-13, 6CO (50) 4, 6CT 13-14, 6CW 14, ZB1FF, ZC4IP (90) 17, a ZD6, and 3V8AN (15) 4. JAs and KAs are rather common stuff west of the Pecos but our down-east cousins eat 'em up. For their edification W5WZQ offers JAs 2BJ 2NX 6AR SAT 9CW and 6BR, plus others already specified. Dave is dreaming up a 3-element array to boost his 117/75 tally. CT2BO (62) 0, HK0AI (70) 0-1 of San André, KC6CG (50) 14, KG6AFT (80) 15, MP4QAL (63) 3, ST2BC (9) 23, UA4KPA (28) 22, VK9OQ (23) 13-14, VU2EJ (43) 2-3, 4X4s CK (15) 21-22, FS (64) 22-23, FW (9) 20, II (92) 22 and other goodies clutter up W0QBA's log to the tune of 132/103. A Viking Ranger was responsible. A one-hour WAC befall W4BBP, thanks to G6TT, CX1FB, VK2PA, KA5HM, ZS6AJ and W4TO in that order. Ben also snagged JA0CA, KJ6FAA, KC6 KR6 and ZD6 clients. A quick scanning of good 14-Mc. fortunes here and there, at W1AB: OY7ML, MP4JO (41) 3, VS2EI, W1WY: raised ZL2AFZ with his 25-watter, leaned down to 3.5 watts and still got through. W2TXB: ZD6EF to reach a 230/201 14-Mc.-only total. W2FZB: FR7ZA (30) 12, and notes long-path ZSs rolling through in the a.m. K2DSW: FY7 GD3 HK0 KA5 and VP5s on Turks Isles. K2GFL: LX1DZ, OY2A, VK9RM

(18) and other nifties contacted K2BZT. At the 100-worked mark, K6ENX collected DU1OR (45) 15, FF8 FO8, HB4FE (80) 15, KC6, KG1AM (30) 6, LA6U (90) 7, TF6WAK (30) 14-15, Turks VP5, VR2CZ (60) 5, VSs 1FH (50) 15, 2CU (90) 15, 2DW (40) 16, 2ES (80) 16, VS6s, ZB1JRK (60) 5-6, ZS, 3V8, 4S7s GE (50) 15-16, WP (35) 15 and one 4X4EF (110) 5. DL4ZC chatted with AP2Y 15-16, CR9, GM3AIM 19 of the Hebrides, LX1JW 17 and ZD2HAI 17. JA6AD ran off with some choice ones: CN2AE, CR6s BX CS CZ, CR19AN, EA6AU, ET2AB, FB8s BE BR, 15s LV REX, KT1UX, MP3BE, TF2WAF, T12s MAR PZ, Sarawacker VS4CT, XE1s CM MB, XW8AB (ex-DL5BS) now off the ban list, YK1AK, ZC2PJ (28) 13-14, ZD2s



Fortunately W4SET (ex-KA4MA-KA5MA), right, took a camera along when he visited the Macao hamshack of CR9AH early this year. CR9AH now works 20 c.w. and looks forward to the return of favorable 10-meter 'phone conditions.



F3BR, long an outstanding French DXer, runs 100 watts to a 5-stage 813 rig on 80 through 10 meters, 'phone and c.w. Henri's receiver is homespun and he favors vertical antennae.

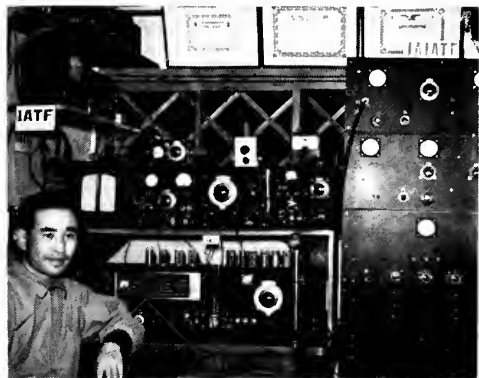
(45) 13, SP2BZ (70) 4, ZD8AA, W3TYH: HK0, JA2AT (11) 21, VR7KAN (47) 22, VQ4FM (73) 20, W4GSJ: YU3CST, W5TFZ: HIRIRL 15-16, PJ2AE 1, YV1AI 17, W80TI: CT2 EA8 GD3, Trieste 11s, JA3AB, an Oman MP4, VP2GW, ZB1AY, 3V8 9S4, W9BZW: 11DCO/M1, OX3UD, W9BJW: Turks, TG9AC (he works A3 to A1), ZP5, GM3JDR: KH6s ER 1J, KG1s AA (85) 18, JB (60) 2, KL7BHK, Turks, XE2OK, ZD4BM. Milwaukee Amateur Radio Club DXers caught up with HZ1AB (57) 22, OD5DA (123) 21, OY2Z (15) 22, VSs 2CV (85) 16, 6DD (14) 13, UA0KAB (50) 5-6, 4X4DF (11) 0 and others. W6UED raised himself CN8EB (80), PJ2BA (40) on Bonaire Isle, JZ0AG (60-80) of N.N.G., F08 KJ6 VK9 VS1 VS6 and FY7 friends. Another Ranger fan, W4GUV rose to 67/43 with HA4TK 20, JA6AR 12, KC6, OK2GR 16, PJ2CF 20, TI2PZ 20, numerous VKs and a ZC4. CR6AI (58) 23, CR7MB (30) 3, FF8 FK8, HA5KKB (63) 0-1, HE1JO (10) 2 of Liechtenstein, LB8YB (39) 4 of Greenland, LZ1, OD5s LJ (62) 6, LX (62) 6, SPs 2GS (28) 23, 6WF (49) 0, VR3A (75) 6, YOs 2KAB (55) 0, 3RF (60) 6, 6AW (52) 8, 4X4GS

DCP (75) 21, WAF and ZE1JS. A 200-watter, SP-600JX and 4-element rotary do well by Hiro. HA5BL (5) 3, SP8KAF (50) 0, VQs 3EO 4RF 8AG (13) 5, YOs 2VM, 3RA, ZC4GF, ZE3JL, 4X4AU and sundry other rarities raised W2ZVS. Dixie finds VK9RM and ZL2AI seeking N. H. and Vt. to complete ARRL WAs, and learns that MP4QAJ hunts 14,080 kc. around 1700 GMT. W5HIS's B&W-5100, SX-28 and 32-ft. vertical scored with JA5 5DF 0AA, KC6AL, KA2s GE USA, KL7s AKE WAF, KV4AA (80) 20-22, VP7N, 3, VS6CQ 12 and many Europeans. West Gulf DX Club's *DX Bulletin*, abetted by the No. Calif. DX Club's *DXer*, gives the lowdown on AG5SQ (114) 14, CR7CO (60) 13, DU7SV (93) 7, EA8BB (40) 0, F18AP (82) 13 and too bad, FK8AJ (60) 5, FQ8AM (5) 4, JA7AD (60) 13, JZ0KS (75) 12, KC6s AJ (40) 7, LZ1KAA (70) 0, MIC (38) 21, SFs 1KAS 17, 3KAU (55) 23, SVs 1SP (16) 12, 0WU (80) 4 of Rhodes, UAs 1KAE (60) 14, 4HI (28) 4, 6KCI 0KI (28) 6, UC2KAB (30) 15, VK9s DB (15) 5, GB (52) 14, RH (35) 6, WJY Os 3CC (65) 13, 8AX (51) 0, 8CB (58) 3-4, VSs 1GJ (40) 14, 2ET (37) 16-17, 6BG (35) 13, VU2EJ (50) 1, Y13WW, YJ1AA, YQ3ET (40) 6, ZAIKAD (50) 3 ZBs 1GBF (77) 23, 68 (8) 0, ZC4PB (15) 4, ZM6AS (78) 4-11, ZS1PD/ZSS, 4X4II (50) 22, 5A4TK (75) 23 and 9S4BS (30) 22-23.

**20** 'phone and its panoply of adamant adherents apprise us of adequate 14-Mc. A3 activity. For example, W9WHM vocalized with DU7SV (198), KC6UZ (11) 13, KJ6s BG (240), FAA (240) 12, KW6BD (222), VS1CZ (170) 14 and VO3GM (133). HR10S, KA2SL and KM6AX returned the compliments of W5HIS to KA2JW, KC6CC (200-230) 8-11, KX6BU, VP6s 21N 16, 7NG 17 and 5A2TZ 21. ZD6EF brought W2TXB's n.f.m. 14-Mc. total to 120/117. FB8BZ, a new Madagascar candidate, (190) 13, runs 50 watts of A3 and speaks scant English. W4HA was one of his first U. S. contacts. VS2BD reports consistent 20-meter 'phone signals from the following Yanks at his Kuala Lumpur QTH: Ws 4DQI 8DAW 8FYR 9BVX 9JJS 0CPM 0CUL 0DPD 0DSO 0DYG 0EOE and 0VUE. These, of course, are in addition to the usual barrage of W5s W6s and W7s that continually rolls into Malaya. A 3-element whirler and 120 watts annexed KA KC6 KX6 KW6, KGs 1AA, 6NAA, KJ6FAA (217) 12, KR6AF, HZ1AB and TA3US to K2CJN's 116/108 total. Steve is another DXer making ready for the autumnal 16- and 10-meter rush. W1YOU's Globe King came



through with **HI6EC** (182), the previously mentioned **HZ1**, **KA2CY** (190), **KG1BO**, **OE13USA**, a Leewards **VP2**, **YU1GM** (105) and **ZP5IB** (286). In case you missed earlier **QST** cues, **KG1s** are Greenland-stationed **GIs**. **W4NYN** made it 127/122 with an **HZ1**, Iwo Jima's **KA0LJ** (165) 14, a **KG1** and **KG6NAB** (270) 12. **HC4BIH** 18, **KG1FR** 17 and a 5A2 answered **W9UKG** but **YS1MS** 7 and **ZP5CG** 20 play hard to get. Six hundred watts promptly produced **Formosa** **BV1US** (290) 12, **VS5CT** (lately **VS4CT**), **JAs** **IACG** **3BK** **3BP** **3DM** **6AD** **6CA** **8AA**, **KAs** **2AK** **2EB** **2MA** **2WA** **2SK** **2SM** **2WW** **3JN** **5WW** **7GB** **7LJ** **7SL**, **8AB** **8SD** **8WK** **9EW**, **CK6** **KM6** **KX6**, **TG9MB**, **SV0WS**, **VK9BS** (174) 14, **VS1s** **CZ** (143) 14, **GL** **GT**, **VR2AP**, **VS6s** **CG** **CL** **CW** (196) 14.



**JAIATF**, known to the old school as prewar **J2PS**, **J7CG**, **MX3H** and **AC1TF**, is back in the game and already has become one of the regulars who lead the breakthroughs to **W/K/AE/VO** areas when 7- and 14-Mc. Asian openings occur.

**VS2s** **BS** **CU** **DQ**, **DUs** **1VVS** and **7SV** for Washington Stater **W7UYZ**. **MRAC** **A3** specialists tapped 20 for **ET2XX** (182) 4, Kerguelen's **FB8XX** (80) 3, Trieste's **1IBNU** (120) 5, **VK91DB** (140) 13, **VQ5FS** (135) 20, **VS1EW** (120) 14, Sarawak's **VS4CT** (164) 14, Pitcairn's **VR6AC** (143) 3, **YO3GM** (115) 21, **ZD4BT** (139) 23, **4X4AS** (160) 23 and **9S4AD** (135) 22. **NCDXC** specifies **VK9OK** of Norfolk Isle, **VP2DL**, **VU2s** **ET** (175) 15, **LL** (186) 15, **4S7SW** (192) 15 and **CS3AC** of the Azores. **WGDXC** swings the 20-phone spotlight on **ACs** **3PT** (114-163), **58Q** (114-163), **C3WV** (190) of Formosa, **FF8AP** (135) 18, **FO8AK** (180) 4, **HC8GI** (166) 5, **IS1s** **BFJ** (131) 3, **BZ** (166) 5, **KJ6BH** (201) 2-3, **MP4s** **BBL** (128-169) 2-3, **BBV** (120-140) 2-4, **OD5DA** (126) 22, **OYs** **3CM** (155-200), **7ML** (155-200), **ST2DB**, **SV0WU** of Rhodes, **SV0WO** in Greece proper, **TF2WAG** (138) 20, **VRs** **2CW** (195) 3, **3C** (160) 3, **XZ2KN** (186) 15-16, **YIs** **2AM** (110-140), **3WW** (107) 17-22 who has 100 watts and a ground-plane, **YJ1AA** (230) and questionable, **ZS2MI** (175) 12-13 of Marion Island, **3V8s** **AN** (106) 6, **AS** (100) 2-3, **BA** (140) 4-5, **4X4s** **BO** (120) 22 and **FV** (150) 0.

**40 c.w.** struggled through its low summer ebb in creditable style. **K2DSW** squeaked through the static to East German **DM2AGO**, **HI3DL**, **HR1JZ**, **1IBNU**/Trieste, **OK1KTI**, **LUs** and **PYs**, **T12CR**, **YUs** **1BK** **3CST** **3DDE** **4BAB** **4DNO** and **4DOP**. Those Yugoslavs really hit 40 with a lead pipe! Skimming the cream, **W2s** **ESO** and **FA** mention **VQ5EL** (12) 2 and **ZD9AC** (38) 8, as well as **YOs** **2VM** (7, 10) 2 and **6AW** (20) 3. **DM2ABE**, **OKs** **1KB** **3KHM**, **KT1TW**, **YUs** **1KD** **2IS** **3ABC** **4JTT** **5CX** **5CXY** and about a dozen other European countries were raised by **W4EUH**'s 100 watts and folded dipe. This was John's initial DX foray and he states, "You'll be hearing from me again!" **K2s** **HZR** **1JN** and **JKC** have the goods on **CR7CO**, **CT3AB**, **HB1HT**, **HK1s** **DG** **TH**, **OX3AY**, **T12PZ**, **VS2CO** and other goodies. **K2DSW**'s Novice friend **KN4CXA** snapped up **WP4ACO** in midband. Here and there, **W4GUV** hooked: **PJ2AE**, **VKs** **KH0s**, **1I9ZYJ**: **VKs** in number, **W0VBS**: **VPs** **4LZ** **9BL**, several Oceanians, **DL4ZC**: a curious **PX1** and **OY7ML**.

**80 c.w.** gets a bold-faced heading this month mainly through the persistence of **W0ZOL**. Roger made the best of an atrocious atmospherics level to work **CE4AD** (10) 7, **VKs** **2QL** (18) 11, **3NR** (10) 12 and **ZL1CI** (20) 10-11. This month officially marks the beginning of the end of the static season in northern latitudes—look to those folded dipoles, zepps and ground-planes, men. And look alive! Rare 3.5-Mc. DX is just over the horizon

in most European QTHs. **DL4ZC** contacted **TF5TP** 23 and **OY7ML** 23 from APO 403. That **OY7** certainly is building himself an excellent all-band reputation.

**15 'phone** is a band to watch closely at this time. As the autumnal equinox sets in you'd better brace yourself for a logful of DXceptional entries. An example of just how good 21 Mc. is right now: **W4NQM** checks his bookkeeping and finds he has worked over 100 ARRL DXCC Countries List items on fifteen 'phone in just four months and two weeks of routine noncontest DXing. Recent additions to Sparky's list include **CN8MT**, **CS3AC**, **CT1OR**, **11BLF**/Trieste, **KT1WV**, **VQ4FO**, **Y13WW** and **ZB1GBF**. **W4WVM** uses a 2E26 final and 3-element rotary beam to roll up Trieste, **OE5HE**, **OQ5VD**, **VP2GG**, **VQ4RF** and **ZB1AJX** for a 70-country total. **W4s** **NQM** and **WVM** report European openings on eleven days out of a 26-day midsummer period. **EL12A** 20, **FM7WQ** 23, **HK2GO** 20, **PZ1RM** 21, **VP5BM** of Turks 1, **VQ4EU** 21, **ZP5s** **GM** 3 and **1B** 17 are specified by **W4GUV** of Birmingham. **W5HIS** collected **HC1s** **ER** **ES** **FK**, **T12EA**, and **VP1GG** who QRTs for **VR2** climes. **KG6ARE**, **T12BX**, **ZL1BY** and **ZP5HX** wound up in **W6ZZs** assortment. At **W8KBT** we find **CX2CN**, **OE6DK**, a Turks **VP5**, **YN4CB** and **YS1RA** on record.

**15 c.w.** is perking up. **CR7CK**, **IS1FIC** 19, **OY7ML** 20, **YK1AK** 12, **ZD6RM** 14 and **ZS6s** came back to **DL4ZC**. **W1CTW** nabbed that **ZD6**, plus **OK1LM** and **ZB1GBF** to raise his 21-Mc. code tally to 72 countries. **ZD6RM** tells Cal that Europeans consistently roll into Nyasaland on the 28-Mc. north-south path. **W4GUV** found **VQ4s** **AQ** and **RF** workable around 20 GMT. **FASRJ**, **PYs** **Gs** and **VP9BL** telegraphed with **K2DSW**. On the Novice front, **K2DSW** says **KN4CXA** has been working **DL** **HK** **LU** and **KV4** with easy grace. **KN2KHZ** did well with several **Gs** **WUs** **LU** and **KP4**. **WNHGM** made good with **DJ1VL**, **G2YK**, **GW3YR**, **1IB9MU**, **PJ2AR** and **YN1AA**. Say, no Novice yet has joined the DX Century Club—any likely candidates?

**10 'phone** holds the interest of **W1WXC**. John has **CE2HD**, **CN8s** **CS** **MM** (heard), **CXs** **2BP** **2GM** **4AB** **4CS** **5CV**, **HCs** **1KV** **4MK**, **1IR4WH**, **OA4CL**, **PJ2AP** and **YV3BD** sneaking through. Argentinians **LUs** **1CM** **1DCH** **4AAR** **4DJT** **5AE** **5DC** **7QB** **8BF** **SDEG** **9CX** **9DDA** and **9EU** also were bagged. Traces of Europe have



**V3RA** keeps on good terms with the native Fanning Island police chief at right. Ray returns to Australia soon, after making a tremendous DX hit with countries chasers throughout the world. (Photo via **W6MUR**)

been tantalizing **W1WXC** and he regularly points his 65-ft.-high 3-element twirler at the Continent and calls "CQ Europe" on 28,525 kc. around 14-15 GMT. **W1Z1W**'s 35-wattier picked off **CN8CS**, **CXs** **3AA** **5CV**, **LUs** **1CM** **1QG** **7QB** **8FB**, **VPs** **2GX** and **9AY**. Europeans have been heard. **GM3JDR** detects signs of 28-Mc. life and dropped down to 10 for a chat with **LU9EV**.

**160 c.w.** created quite a stir in July and August much to everyone's surprise. **W1BB** reports that **G3s** **ERN** **GCN** **JOJ** and **JV1** started things off by writing several **Ws** for summer schedules. Among those who said "Sure!" were **K2BWR**, **Ws** **1BB** **3RGQ** **9NH** and **9PNE**. So what do these inveterate static-hounds do but pull off some nice transatlantic contacts beginning in early July! **K2BWR** evidently turned the trick first with **G3GGN** (1828 kc.). **W3RGQ** followed suit with a **G3GGN** QSO next evening, all this two-way work occurring between 10 and 11 P.M. **EDST**. Other unidentified signals were creeping across the pond at the same time but no other two-ways were reported. Gosh, what next?



Few North American amateurs have QSO'd the Finnish department (state) of Ahvenanmaa, the Aaland Islands, in the Gulf of Bothnia. OH1s NK PI ST, standing l. to r.; OH1RX, seated; and OH1SS, who snapped this photo, gave opportunity for such OH1 contacts during the week end of May 21st-22nd. Their DXpeditionary force accomplished 214 QSOs on 14 Mc. and 60 on 3.5 Mc., all c.w. save one. Seventy U.S.A. contacts were recorded. The 200-watt transmitter belongs to OH1ST, the receiver to OH1RX. Ground-plane and long-wire antennas were used.

(Photo via KN2KHZ)

## Where:

Rather light trading indicated by our QTH tickertape this month. On the bearish side, W5FGE knows nothing about ZC6AA — save your QSLs ..... PA0XD, who works scads of W/Ks, lost his QSL check-off list for QSOs up through May 30th. Reapply if yours hasn't shown ..... NCDXC suggests that W6OME may be able to assist you re tardy TA3AA QSLs. But, all in all, the entire TA3AA crew did a commendable job in the verification department ..... W1OJR stresses that the Panama QSL Bureau answers to LPRA, P.O. Box 1622, Panama, R.P. — not Box 1612 ..... W1s OJR UED WPO ZDP, K2s BZT EUH, W3TYW, W4s GUV HA, W6ZOL, W7PHO, W8OTI, W9s FGX UKG WIIM, W0VFM, DL4ZC, NCDXC, SCDXC and WGDXC took time out from summer vacations and rebuilding projects to tip you off on

CM2PX, J. M. Campo, 12 No. 8 Paraiso Cotorro, Habana, Cuba ..... CN8EB (QSL via W3WDI) ..... CN8EM, L. J. Shaw, Navy 214, Box 60, FPO, New York, N. Y. .... CR10AN, Box 24, Dili, Portuguese Timor ..... DL4EL (QSL via W1WOK) ..... EI4AB, C. Connolly, 22 Michael St., Waterford, Eire ..... EI6AB, Naval Radio Club, Waterford, Eire ..... F3BR, Henri Gadoin, 3 rue Jacques Coeur, Bourges (Cher), France ..... FB8BZ, P.O. Box 1171, Tananarive, Madagascar ..... FF8BK, A. Grolimund, B.P. 38, Seguela, Ivory Coast, French West Africa ..... FF8BL, J. Bonafous, B.P. 971, Dakar, French West Africa ..... FF8BM, H. Peltier, B.P. 971, Dakar, French West Africa ..... HE1JO-HB1JO (QSL via USA) ..... HC4BH, P.O. Box 313, Guayaquil, Ecuador ..... HI17W (QSL via W6OXs) ..... HH0W (QSL via W6OXs) ..... I1BRN/M1, Box 20, Ferrara, Italy ..... I1DCO/M1, Box 20, Ferrara, Italy ..... IS1A1K, A. F. Ravenna, via P. Amedeo, 35, Cagliari, Sardinia, Italy ..... IS1EHM, Maria Marras, via Regina Elena 17, Cagliari, Sardinia, Italy ..... KG1AW (QSL via W5GKX) ..... KG6AGB, R. See, Navy 943, Box 3, FPO, San Francisco, Calif. .... MP4BBT, W. H. Parker (W5EVW), % Albert Mussa, Box 26, Tewfa, Egypt ..... MP4BBV, % RAF, Bahrain Island, Persian Gulf ..... OH1s NK/0P1/0RX/0 SS/0 ST/0 (QSL via KN2KHZ) ..... ex-TA2EFA (QSL to W4PAZ) ..... UB5KAB, Box 27, Stalingrad, Ukraine, U.S.S.R. .... ex-VK11IM, C. W. R. Holman, % Radio 6NA, Narragin, W.A., Australia ..... VK9RO, R. M. Ellison, SDA Mission, P.O. Box 21, Wau, T.N.G. .... VP1EK, Dr. E. K. Kredler, Hospital El Cayo, British Honduras, C.A. .... VP6DS, C. D. Seale, Kingsley, 2nd Ave., Belleville, St. Michael, Barbados ..... VP6FR, F. A. Rock, Green Hill, St. Michael, Barbados ..... VP6GC, G. S. Corbin, Roebuck St., St. Michael, Barbados ..... VP6SS, C. E. Stoute, South End, Brighton, St. Michael, Barbados ..... VP6UN, J. M. Richardson, Piquesburg, Kent, Christ Church, Barbados ..... VP7NN (QSL via W4VBI) ..... VQ5EL, Box 89, Kampala, Uganda ..... ex-VS9AW (QSL to VS1GO) ..... Y13WW, P.O. Box 293, Baghdad, Iraq ..... ZA1KAD (QSL via AR1) ..... ZB1AY (QSL via ZB1E) ..... ZA2AW (QSL to SM5ARP)

## Whence:

Asia — The Nicobar Islands have been inconspicuous by their ham-band absence since VU5AB shut down a couple of years ago. VS2DQ observes: "A recent VU5AB definitely is a pirate. There are VS1 amateurs who visit there regularly

and sometimes stay there a considerable time. But licenses are issued by the government of India and, alas, it seems impossible for any of the VS1 boys to get one." VS1GO affirms this in penning W1WPO: "Haven't heard any further about the VU5 deal — guess that's fallen through. I return to the U.K. in the fall, anyway." VS1GO (ex-VS9AW) has been working 160, 80 and 40 meters but hopes to get in some sessions on 20, 15 and 10 before moving Europeward. Reliable power components, he says, are extremely difficult to come by over there ..... AC4NC, on leave in Calcutta of late, is expected to be back in action at the Tibet Indian Mission before long ..... W5EVW, trying his luck as MP4BBT, verifies that MP4s QAG and QAH have left the Middle East for leave and reassignment ..... JA1FM, one of the first Japanese YLs licensed postwar, mainly enjoys transpacific work on 7-Mc. 'phone. The International DX League, Box 56, Kyoto Central P.O., Japan, now issues an ambitious DX newsletter titled QAV ..... Thailand evidently has authorized a few legitimate ham licenses but HS1 authorities still haven't bothered to remove their country from the International Telecommunications Union's taboo list (see p. 61, last month's QST). W6ZOL ran across one HS1BC on 40 c.w. and copied his QTH as Choon Sasamvai, 46 Manerok, Raja Damnven Ave., Bangkok. The fellow QRM's himself with a terrific backwave ..... W9KOK heard from ex-AC4RF shortly after the latter's release from a 6-year Red China imprisonment. Bob hopes to be back on the air with a G call soon and possibly from other rarer spots in the future. At present ex-AC4RF's time is fully occupied in writing and lecturing on his harrowing Asian experiences. .... A cheery welcome to the country of Laos (XW8) which now is back in the good graces of international amateur radio. Laos removed itself from the ITU ban list as of July 20th and FCC-licensed amateurs now are free to work XW8s. XW8s AA and AB already are available on 14 Mc. 'phone and c.w.

Oceania — ZC3AC was plagued by transformer burn-out troubles throughout the summer — winter on Christmas — but VS2DQ finds him still hopeful of a full-scale 14-Mc. onslaught before 1956 sets in. Christmas Island has no airstrip, receiving mail but once monthly by sea from Malaya or Australia. High humidity remains the curse of tropical electronics; FW8AB of Wallis also fights continual power-component failings ..... VK9OK has another year or so left on Norfolk Island, according to E. G. Riggall. Len most of all desires consistent contact with the United Kingdom but the G paths are rarely open for him on 20 ..... According to Amateur Radio of WIA, W2CPN (ex-W9RCQ) is making quite a hit during his Down Under visit. Also, shipboarders X1NE and X1NP again are hamming on 14 Mc. in Australian waters. VK3XU takes over as WIA awards manager and has been an outstanding DXer for years ..... W4GUV learns that KC6CG brought his QSLs backlog under control by dispatching a spanking batch Statesward, all via bureaus ..... We welcome the Kermadec Islands as a new member of the ARRL DXCC Countries List family. This group, annexed by New Zealand in 1887, normally is uninhabited. That means the Kermadecs will be a prime target for DXpeditionary efforts by ZLs and other itinerant DXers ..... WGDXC addenda from Pacific areas: KH6AIW plans a visit to KM6 KS6 and KX6 haunts. .... KG6SB mentions a new KG6S club station upcoming on Saipan. .... FK8AO (ex-FQ8AE) runs 75 watts to an MD2AC multiband skywire with a rhombic in the works. He's active mostly on week ends, 0200-0900 GMT, 20 meter c.w. .... W6SAC is mentioned

in connection with a possible Wallis isles DXcursion. . . . VR6AC has a diesel power outfit and a three-element beam on Stateside order. . . . KC6CG has worked over 50 WGDXC votaries and is found regularly between 14,200 and 14,220 kc. at 1200 GMT.

**Europe** — DARC (Germany) invites world-wide participation in its WAEDC contest, an interesting new affair scheduled for (c.w.) 0000 GMT Sept. 17th to 2400 on the 18th, and (phone) the same hours Sept. 24th-25th. European stations will QSO non-European stations on all bands 3.5 through 28 Mc. The serial exchange is the usual five-digit (phone) and six-digit (c.w.) numeral — RST001, RST002, etc. **SCORING** (for non-European entries): Each completed QSO counts one point and each station can be worked but once per band. *Additional points* can be earned by transmitting "QSO reports" to European stations, these designated as "QTC" at one point each. Each QTC consists of three parts — (1) time in GMT, (2) station call, and (3) QSO number, of any previous WAE Test QSO. For instance,



SVs ØWO ØWN ØWK, front, l. to r.; ISP IAB, an SWL, middle; ØWL, another SWL, ØWQ and ØWT, rear, make up the majority of the Athens, Greece, ham gang. Other Athenians not available for this picture: SVØs WI WN WP WR and WU, the latter active on Rhodes almost daily, 0500-0730 GMT, using 14 Mc. (Photo via STØWO)

W5XXX raises DL7AA and thereby garners a QSO point; W5XXX previously worked G6ZO at 1207 for G6ZO's 113th Test QSO. So, in addition to the QSO point for his DL7AA contact, W5XXX gains another point if he sends "1207/G6ZO/113" to DL7AA. As many as ten QTCs can be sent per QSO but each QTC can be sent but once. Ergo, the more QSOs you rack up, the more QTCs you have available to parlay into additional points. *More additional points*, termed bonus points, are gained by working a station on three different bands (2 points), four bands (3 points) and five bands (4 points). *Multipliers* are derived from a modified version of DARC's WAE Award countries list, as follows. CT1 CT2 DL-DJ EA EA6 EI F FC G GC GD GI GM GW HA HB HE HV I IS IT NI LA LX LZ OE OH OK ON OY OZ PX SM SP SV TA TF YO YU ZA ZB1 ZB2 3A2 984 plus Trieste (IT), Jan Mayen (LB), Spitzbergen (LB), Rhodes (SV), Crete (SV), Aaland Islands (OHØ), Shetlands (GM), Orkneys-Hebrides (GM), arctic Norway (LA), arctic Finland (OH9), arctic Sweden (SM2), Bornholm Island (OZ), West Berlin (DL7), German East Zone (DM) and Gotland (SM1). *For final score*, multiply combined QSO points, QTC points and bonus points accumulated on all bands by the combined numbers of multi-

pliers collected on each band. Certificate awards will be available for highest scorer per country and presumably per U. S. and Canadian call area, in separate single-op and multiop categories. Such winners will be deduced from logs submitted to DARC's DX Bureau, Fuchsienweg 51, Berlin-Rudow, Germany, postmarked before November 20, 1955. See you on the north Atlantic paths, DROMS! . . . . .

Two unsolicited bouquets from the Continent for often-maligned WDX chasers, SM5ARP, reference his recent summer idyl in Monaco: "Had much trouble with the 3A2AW rig this time, lots of troubleshooting. W manners were excellent and permitted speedy operation." And from HB9HT of Swiss FD set-up HB1HT: "I would like to express our thanks to all the many W stations who, with their snappy operating, were a great deal responsible for . . . our high score." . . . . . IRTS (Eire) had a field day, too — everybody's doing it — and declares that "this year's National Field Day will go down on record as one of the wettest ever experienced." [No, Boss, they mean rain. . . . . *Jeeves*]. . . . . IIs BRN and DCO gave the gang some good shots at San Marino in early July. K2BZT got in on the spoils early, noting that most of the W crowd was caught napping on this quickie. Hayden is among the many W/K brethren on the watch for an HB1 or HB9 in Valais canton, a real rarity for Illelveta-22 sheepskins. . . . . GM3JDR, with 111 countries to his 150-watter's credit, states that his is the most northern ham station in Scotland. Furthermore, he and GM3BZJ are the only amateurs in County Caithness. GM3JDR still needs Miss, Nev., N. Mex., S. Dak. and Utah for WAS and guarantees 100 per cent QSL . . . . .

Supplementing this month's introductory remarks, W9UKG passes along info on the Hungarian ham set-up. There are about 60 HA licensees active, about half of which operate collective (multiop) layouts. The remainder stick to v.h.f. bands. License classifications go like this: *Ultrahigh*, 10 watts input from 144 to 10,500 Mc.; *Class A*, 10 watts on 3500-3850 kc., c.w. only, for one year; *Class B*, 50 watts on "all bands" with all permitted emissions; and *Class C*, 200 watts, same as Class B otherwise. HA5KBA, the Hungarian "headquarters station," appears to be in a class by itself with a flock of operators, 750 watts input and much American-made equipment. . . . . DM2ABK informs W9UKG that three East German prefixes now are in use: DM2 for "private" amateur stations, DM3K for collective stations, with DMØK calls representing individual operators of collective stations.

**Hereabouts** — "The W9-DXCC annual meeting will be held at the Sheraton Hotel, Chicago, Saturday, September 17th, from 2:00 p.m. on, with a dinner being served at 6:00 p.m. The meeting is open to any and all holders of DXCC certificates. Interested parties should write W9s FID FKC NN or QIY for details." This from W9FID. Get in touch with the boys immediately concerning this on-clave because guys are still raving about the last one. . . . .

W7CSW is doing some slant-7 operating in Idaho this summer. Overseas 14-Mc. WAS aspirants take note . . . . .

VP1EK, one of the newer British Honduras actives on 14 and 21 Mc., is a good bet for a fast VP1 pasteboard . . . . . FFER/K2JC's hears that VP2GG is making plans for heavy Windward Islands activity on 21 Mc. after a few years on 40 meters. Friend VP2DL normally sticks to 20 . . . . .

W2TXB chased ZD6BX all over the place for two months and then clicked abruptly with ZD6EF. Naturally, with the pressure off, ZD6BX came back shortly afterward. Al is a charter member of the "Never Give Up!" QSL club, too. ZK1AH's confirmation came through after six years: PK6VK, four years; CR5UP and VK9FM, three years apiece. . . . .

WPW and Dutch St. Marten licenses are difficult, if not at present impossible, to obtain. . . . . KH6AR personally visited W6ZZ after a series of 100 QSOs beginning in 1936 when they were K6MIV and W1WV, respectively. Veterans of old 10-meter days will recall that K6MIV's Hawaiian phone was among the first to bombard the East Coast in the mid-1930s. W6ZZ's new RSGB Empire DX Award, incidentally, is signed by the mayor of Southgate, England (G6CLJ).

Periodically a feature in DX doings is the sudden appearance of HB1 portables on DX bands during the Swiss National Field Day sponsored by USKA. Here is the 1955 affair's top-scoring layout, HB1HT, with (standing, l. to r.) C3EIO, HB9s LD EL, an SWL, HB9HS; (seated) HB9s HT LO and PW in attendance. This group, representing the Zurich Ham Gang in the activity, used a 50-watt gang-tuned bandswitching rig and a 70-foot-high 80-meter zepp with main lobes on Great Britain and U.S.A. Swiss, British, Belgian and German amateurs usually arrange coinciding FD dates to boom participation into one of Europe's outstanding annual ham events.

September 1955





# Operating News



F. E. HANDY, WIBDI, Communications Mgr.  
R. L. WHITE, WIWPO, Asst. Comm. Mgr., C.W.  
PHIL SIMMONS, WIZDP, Communications Asst.

GEORGE HART, WINJM, Natl. Emerg. Coördinator  
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., 'Phone  
LILLIAN M. SALTER, WIZJE, Administrative Aide

**New Season Ahead.** September marks the beginning of another operating season! The old sunspot cycle has definitely turned the corner, is over a year on its way, and such bands as 10 and 15 meters will be open for longer periods with more DX offered up for those alert to work it. Net activity and traffic will continue to be well supported as the nets "up" their number of sessions and the amateurs returning from vacation get back in the swim. The v.h.f. activities this September (and at other periods in the season schedule) should be the best ever; there were new highs in accomplishments and participation in the '54-'55 season. Don't overlook the chance to get into the FMT (Frequency Measuring Test) on the evening of September 15th . . . see announcement elsewhere in these columns.

Individual report of FMT results is sent you, if you report, and with an information copy to the appropriate SCM. This is so that if you do well enough this can document your application to the SCM for an Observer post in the frequency measuring classes. But more amateurs are needed in OO operations to send "coöperative mail notices" to fellow amateurs to help them avoid FCC citations, also "for better operating." Whether or not appointed in a frequency measuring classification you can get lined up for c.w. or 'phone observing posts aside from frequency measuring.

For RMs, PAMs and NCSs who have not already done so, this is a reminder that it is time to reregister the frequency and operating periods of all nets to get them included in the annual Net Directory.

**On the Correct Handling of Messages.** During the vacation season, the undersigned was shocked to get the radio suggestion from one member of a 'phone net to whom a message was being *relayed* that he would change the text; he thought it more clear if the text were worded a different way! Let it be clear to everyone, once and for all, that it is a standing communications principle in all communications systems worthy of the name that *the text of the message cannot be changed except by the originator*. To do so would result in distortions of meanings, and lack of confidence in any such undependable service that turned out messages with modified texts. Besides watching such things that by observance spell out sound communication practices, every new and old traffic handler is urged to require "place" and "date" given with the other vital information preambles should include. The check is helpful and important.

Our young friend who volunteered to add a word to the text had apparently no thought that this would not be compatible with the group count that the message already carried!

It should in fairness be said that the over-all picture of vacation message service was impressively good and coöperation high in all directions. Many functioning nets were observed.

**FD Post-Mortems.** W8ENS (Springfield, Ohio, Amateur Radio Club) compares the exigencies of the Field Day to those of civil defense or emergency operations. He says planning should involve tents painted with a broad stripe to identify them, stakes the same color (80-meter tent with red poles and stakes, for example). A 100-foot rope to attach to the power unit to prescribe the exact distance to set up the different tents would have helped. W8ENS notes the contrast between loud *emergency* talkers and joiners and the "amazing few that show up when the real shake is on." As he puts it, where would we stand if members of an emergency group had never put up a wire in rain, sleet or ice or didn't own a pair of boots or raincoat, nor had a gallon of gasoline stashed away for use in emergency? One objective of Field Day is to learn these things. (We gather there *was* rain in Ohio and some missing items for coping with these offenders speedily and with highest efficiency!)

W7RGL in the wee Sunday morning hours of FD heard many calls sent poorly and too fast. He reduced *his* 17-w.p.m. speed to set a striking example of change in technique and reports the results worthy of duplication. He says, "Changing to 8 w.p.m. I called CQ FD. The result was immediate, four slow but clean replies. In the next hour sticking to 8 w.p.m. I *doubled* the number of contacts per hour."

The Joliet Amateur Radio Society in "Ground-Waves" reviews its performance and for the record lists six points it will take up for next year. Other groups may have a different list but some points are sure to be generally applicable: (a) have not less than four operators for each position; (b) each operator to be given a chance to practice with transmitter and receiver before FD to minimize fumbling-time; (c) plan beams; (d) use speech compression; (e) arrange *training* Novices to improve logging and assist checking, several advance one-hour sessions.

All early reports indicate that *several groups* topped last year's showing. It's amazing to us that eyes are so soon focused on '56 plans. *QST* will have more on preliminary results for this year soon.

## A.R.R.L. ACTIVITIES CALENDAR

Sept. 3rd: CP Qualifying Run — W6OWP  
 Sept. 14th: CP Qualifying Run — W1AW  
 Sept. 15th: Frequency Measuring Test  
 Sept. 17th-18th: V.H.F. QSO Party  
 Oct. 7th: CP Qualifying Run — W6OWP  
 Oct. 8th-9th: Simulated Emergency Test  
 Oct. 13th: CP Qualifying Run — W1AW  
 Oct. 15th-16th: CD QSO Party (c.w.)  
 Oct. 22nd-23rd: CD QSO Party (phone)  
 Nov. 5th: CP Qualifying Run — W6OWP  
 Nov. 12th-13th, 19th-20th: Sweepstakes  
 Nov. 18th: CP Qualifying Run — W1AW  
 Dec. 2nd: CP Qualifying Run — W6OWP  
 Dec. 12th: CP Qualifying Run — W1AW

**For Enjoyable Operating.** The quarterly (summer) CD Party in July was the day-off or "chance to live it up" for the whole family of ARRL appointees. Sometimes the newer amateurs write in to ask about these things and we are only too glad to tell all readers about the set-up.

The operating highlights for appointees known as CD Parties are scheduled four times a year, usually in the later weeks of January, April, July and October. Such radio get-togethers promote fraternalism. One meets fine operators and has QSOs "all over" wherever the equipment used is flexible enough to permit changing easily from band to band. There can be long chats or fast contacts and an unparalleled opportunity to test station range and consistency.

To be an ARRL appointee one has to agree to send consistent activity reports monthly to his SCM (address page 6, *QST*). The activity in a selected SCM-appointment status that assists fellow amateurs earns the right to participate in the quarterly radio activities as they come along. The idea is that appointees do more for each other and fellow amateurs than in casual work, each appointment being dedicated to particular aims. Send a radiogram or a postal card for a copy of "Operating an Amateur Radio Station" for detailed information on each appointment post. If you are more than a casual amateur and have some time to dedicate to definite objectives, get your SCM to accept your application for appropriate station or leadership appointments along the lines of your natural interest.

— F. E. H.

## BRIEF

The "Worked All VE" award is now being issued by the Nortown Amateur Radio Club on behalf of the Canadian Amateur Radio Operators' Association. All amateurs are invited to try for WAVE. Here are the rules:

(1) Obtain two cards for QSOs with amateurs in each of these Provinces: Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia.

(2) Each of the two cards must be from a *different station* and for work on a *different band*, for a total of 18 cards.

(3) Yukon and N.W.T. cards may be submitted in place of VE7 cards.

(4) All contacts must have been made after January 1, 1959.

(5) Mail confirmations, with 50 cents to finance their return, to Nortown Amateur Radio Club, P.O. Box 356, Adelaide Street Postal Station, Toronto, Ontario, Canada.

## DXCC NOTES

Announcement is hereby made of one addition to the ARRL Postwar Countries List. The addition will be the Kermadec Islands. These islands are located approximately 600 miles NNE of North Cape, New Zealand, and are administered by New Zealand.

DXCC credit will be given starting November 1, 1955, for creditable confirmations dated on or after November 15, 1945. This will permit foreign amateurs to start receiving credits at the same time as those in U. S. A. Confirmations received prior to November 1, 1955, for this country will be returned without credit.

In future ARRL DX Competitions, those making contact with amateur stations located in the Kermadec Islands may claim credit for a separate country in accordance with DXCC rules.

## DX CENTURY CLUB AWARDS

### HONOR ROLL

W1FH.....259	W8NBK.....250	G2PL.....248
W6VFR.....254	W0YXO.....250	W2BXA.....247
W6AM.....253	W3GHD.....249	W3KT.....247
W6ENV.....251	W6SN.....249	W6MX.....247
W5HGW.....251	W6SYG.....249	W5MIS.....246
PY2CK.....251	W2AGW.....248	W6MEK.....246
W3BES.....250	W3JTC.....248	W7AMX.....244

### Radiotelephone

PY2CK.....243	W1JCX.....219	XE1AC.....215
W1FH.....231	W1MCW.....218	W8HGW.....214
VQ4EHR.....231	W1NWO.....217	W3JNN.....213
ZS6BW.....227		W9RBT.....210

From June 15, to July 15, 1955, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

### NEW MEMBERS

W6HX.....210	W1OJR.....104	W2FCT.....101
W3VKD.....141	W1WAI.....103	W2FJJ.....101
W4FFV.....121	W2BFA.....103	W3RBW.....101
FSLF.....115	W5ABY.....103	W6HJ.....101
O55PP.....108	OH5OC.....103	W8MQR.....101
OH2VZ.....107	W0QBA.....102	OH1PI.....101
W5LAK.....106	W5TPC.....102	W1DHM.....100
HR1AT.....105	KP4TE.....102	W6YMH.....100
OE2SP.....105	SM7AOO.....102	G3HJJ.....100
SM7BHF.....105	W1BRX.....101	4X4DR.....100

### Radiotelephone

G4JW.....109	W3VKD.....103	W3OGR.....101
W2DCO.....107	PY1ANU.....103	KL7AON.....101
W1QJG.....105	W2WCY.....102	W6LTR.....100
LU4ES.....104		1BXX.....100

### ENDORSEMENTS

W8KIA.....241	W0NLY.....160	W7HQC.....140
W3JNN.....240	HP1BR.....160	W8DUS.....140
W8SYC.....220	W8MFE.....155	YV5BZ.....140
W5FFW.....214	W0QVZ.....155	W6ALQ.....137
W6LW.....203	W1ZD.....153	W6SWG.....133
W6NTR.....203	W3MFW.....152	W2KMZ.....131
CM9AA.....201	W0DXE.....152	W6FOZ.....131
W3CGS.....192	W2GTL.....151	W2ZGB.....130
KP4CC.....192	W4AAW.....151	W8WHI.....128
W2GFW.....184	G3AAE.....151	PY1ANR.....127
W8LKH.....183	W6ID.....150	SM7VX.....123
W2QVZ.....180	HB9ET.....150	W3NCF.....122
W3ECR.....175	1ICJW.....150	W7PEY.....121
W6JK.....171	W2ICO.....143	W4UX1.....112
W6CTL.....170	OY3Z.....143	VE3XY.....112
W8TJM.....170	W5AWT.....141	W1WLW.....111
W6TXL.....163	W8MWL.....141	YV5FK.....111
W5AE.....162	W4HRB.....140	W2SIB.....110
G14RY.....161	W4QCW.....140	PA0FAB.....110

### Radiotelephone

ZS6Q.....202	W4AAW.....151	W2FXE.....131
EA2CQ.....200	W6GVM.....151	W8MWL.....130
PY2AHS.....176	W3ECR.....141	W3DPS.....126
W1CLX.....151	W8QJR.....141	W7PEY.....118
	W1PST.....140	

### W/VE/VO Call Area and Continental Leaders

W4BPD.....241	VE3QD.....210	VO6EP.....190
W8XDA.....243	VE5QZ.....210	4X4RE.....210
VE1HG.....150	VE6GD.....108	ZS6BW.....234
VE2WW.....181	VE7HC.....209	ZL1HY.....238
	VESAW.....160	

### Radiotelephone

W2APU.....202	W6DI.....205	VE2WW.....102
W2BNA.....202	W7HIA.....181	VE3KF.....163
W4HA.....184	W0AIW.....179	VE7ZM.....140
W5BGP.....202	VE1CR.....120	W2SIB.....110
W6AM.....205		ZL1HY.....196

## FREQUENCY MEASURING TEST, SEPTEMBER 15TH

All amateurs are invited to try their hand at frequency measuring. W1AW will transmit signals for the purpose of frequency measurement starting at 9:30 P.M. EDST (6:30 P.M. PDST), Thursday, September 15th. The signals will consist of dashes interspersed with station identification. These will follow a general message sent to help listeners to locate the signals before the measurement transmission starts. The approximate frequencies used will be 3622, 7034 and 14,078 kc. About 4½ minutes will be allowed for measuring each frequency, with long dashes for measurement starting about 9:36 P.M. It is suggested that frequencies be measured in the order listed. Transmissions will be found within 5 or 10 kc. of the suggested frequencies.

At 12:30 A.M. EDST, September 16th (9:30 P.M. PDST, September 15th), W1AW will transmit a second series of signals for the Frequency Measuring Test. Approximate frequencies used will be 3675, 7046 and 14,125 kc.

Individual reports on results will be sent to all amateurs who take part and submit entries. When the average accuracy reported shows error of less than 71.43 parts per million, or falls between 71.43 and 357.15 parts per million, participants will become eligible for appointment by SCMs as Class I or Class II OOs respectively.

This ARRL Frequency Measuring Test will be used to aid qualification of ARRL members as Class I and Class II observers. Present observers not demonstrating the requisite average accuracy will be reclassified appropriately until they demonstrate the above-stated minimum required accuracy. Class I and Class II OOs must participate in at least two FMTs each year to hold appointments. SCMs (see listing, page 6) invite applications for Class III and IV observer posts, good receiving equipment being the main requirement. All observers must make use of the cooperative notices (mail forms provided by ARRL) reporting activity monthly through SCMs, to warrant continued holding of appointment.

Any amateur may submit measurements on one or all frequencies listed above. No entry consisting of a single measurement will be eligible for QST listing of top results; at least two readings should be submitted to warrant QST mention. Listing will be based on over-all average accuracy, as compared with readings made by a professional frequency-measuring lab.

### NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C.W.	'PHONE
3550 14,050	3875 14,225
7100 21,050	7250 21,040
28,100	29,640

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. — 3535, 7050, 14,060; 'phone — 3765, 14,160, 28,250 kc.

### CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on September 14th at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,010, 52,000 and 145,600 kc. The next qualifying run from W6WOP only will be transmitted on September 3rd at 2100 PDST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions will be made from W1AW each evening at 2130 EDST. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy.

Date	Subject of Practice Text from July QST
Sept. 1st:	A Four-Band S.S.B. VFO, p. 11
Sept. 7th:	Versatilize Your Oscilloscope, p. 13
Sept. 9th:	Band-Scanning — The Easy Way, p. 18
Sept. 12th:	A Tripler for the 1215-Mc. Band, p. 20
Sept. 20th:	Subinterval Markers . . . , p. 22
Sept. 22nd:	Selenium Break-In Keying, p. 28
Sept. 26th:	Hints & Snarls — GVZ Style, p. 45
Sept. 28th:	With the AREC, p. 70

### W1AW OPERATING SCHEDULE

All times given are Eastern Daylight Saving Time)  
*Operating-Visting Hours:*

Monday through Friday: 1300-0100 (following day).

Saturday: 1900-0230 (Sunday).

Sunday: 1500-2230.

*Note:* W1AW will be closed from 2230 Sept. 4th to 1300 Sept. 6th in observance of Labor Day.

A mimeographed local map showing how to get from main highways (or from HQ. office) to W1AW will be sent to amateurs advising their intention to visit the station.

*Official ARRL Bulletin Schedule:* Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules.

*Frequencies:*

C.w.: 1885, 3555, 7125, 14,100, 21,010, 52,000, 145,600 kc.

'Phone: 1885, 3945, 7255, 14,280, 21,350 kc.; 52 and 145.6 Mc.

*Times:*

Sunday through Friday, 2000 by c.w., 2100 by 'phone.

Monday through Saturday, 2330 by 'phone, 2400 by c.w.

*General Operation:* Use the chart on page 70, May QST, for determining times and frequencies for W1AW general contact with any amateur. Note that since the schedule is organized in EDST, the operation between 0000 and 0100 each day will fall in the evening of the previous day in western time zones. See also the note on page 65, August QST.

*Code-Proficiency Program:* Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and at 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday are made on the above-listed frequencies. Code practice starts at 2130 each day. Approximately 10 minutes' practice is given at each speed. On Sept. 14th, Sept. 15th and Oct. 13th instead of the regular code practice, W1AW will transmit certificate qualifying runs and a frequency measuring test.

### TRAINING-AID NOTES

Affiliated clubs will want to note the addition of two films to the League's visual aids library. The General Electric Company has placed two films on deposit for use by affiliated-club groups, whose secretaries are invited to write in to the ARRL Communications Department for booking information.

1) "And a Voice Shall Be Heard," 22 minutes, black and white sound. The importance of communications in coordinating the relief activities of a disaster-stricken city is demonstrated with emphasis on the part played by the radio amateur.

2) "Principles of Electricity," 20 minutes, color sound. This animated film gives individual treatment to the volt, ampere, ohm, etc. The latter portion explains the essence of magnetism and magnetic fields.

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Note too the new addition of a slide collection, produced by the Rochester Antique Wireless Association, the object of wide acclaim throughout the country. Titled "The First Thirty Years of Amateur Radio," the slides and accompanying tape-recorded lecture are sure to please old and new club members alike. Affiliated club officers are urged to follow standard booking procedure, allowing ample notice and choice of dates. Address all correspondence to the League's Communications Department.





The dates for this year's Simulated Emergency Test have been set as October 8th-9th (see Activities Calendar, June and subsequent issues of *QST*). Now don't say you weren't given advance notice. The customary bulletin will be in the hands of ECs by the end of this month.

We've been doing some thinking about the SET. Wish you would, too. In past years, we have been most liberal with dates on each side of the designated week end, and this has resulted in ability of ECs to combine SET with local civil defense or Red Cross activities, or pick a date or week end more convenient for AREC registrants. It has had the disadvantage of detracting from the nation-wide demonstration aspect of our SET, about which we are usually called by newspapers and press associations.

The SET is the ARRL's and the amateur's own exercise. It has been conducted every year since 1947, in conjunction with whatever agencies the AREC is serving. Naturally, since the Red Cross is and always has been one of the primary agencies to be served, it played a key part in the exercise, to the extent that many amateurs got the impression that the SET was a Red Cross test. In these cold-war days, civil defense has become more important, and inevitably c.d. has played a bigger part each year in the SET. Such participation has not necessarily been at the expense of Red Cross participation, although in some places where the emphasis has shifted, this has been the net effect.

We would like to request that ECs, if at all possible, this year plan their SET for the designated week end. We expect to continue the liberal policy regarding dates, and any participation within a week or more of the October 8th-9th week end will be considered eligible for inclusion in the SET data. But it makes a better national impression if we all conduct our tests at the same time, or at least on the same week end, particularly since many stations operate on the National Calling and Emergency Frequencies during that week end for the specific purpose of assisting in the handling of traffic.

Only a few stations copied the Test Emergency Alert last year. It was sent only once, by W1AW. This year, we hope to have W1AW repeat it several times, and perhaps have stations in the Midwest and Far West send it at unspecified times also. In any event, we'll have TEA in this year's SET. Watch for the details in the announcement, October *QST*.

W6PKI reports that on May 7th the only medical man on Falalop Island, a pharmacist's mate, was seriously injured when struck by a military vehicle, and aid was summoned by amateur radio. Ed Pitta, operator of KC6CG, made contact with KA3MD in Japan who immediately got advice from military doctors which enabled him, with the aid of a native girl nurse, to do the things necessary to save the victim's life. KA3MD then contacted KG6AA, operated by Capt. Comstock on Guam, who instigated an emergency air flight to Falalop to evacuate the injured man. Military doctors credit Ed Pitta, KC6CG, with saving the man's life by his prompt action in getting medical advice.

The AREC 10 Meter Net of Nassau County, L. I., held their first hidden-transmitter hunt on January 6th. W2KCW/m was the hidden transmitter at a spot where Hewlett Bay almost surrounded him. Four fixed stations,

with the help of beams and W2ZJB with a loop, made a fix, plotted it on a map and directed the twelve mobiles to the location. Within the "fix" area of one square mile the gang had to drive up and down the various canal roads until the correct one was found. K2AMN's mobile loop proved so good that most of the mobiles are planning to install one.

— W2ZAI, SEC N. Y. C.-L. I.

An emergency drill called the "Hia-Springs" drill was conducted by the Dade County AREC starting at 1400 EST on Feb. 27th. EC W4IYT alerted the AREC and Dade Emergency Net. Emergency net control stations were set up at the Hialeah Fire Department and at City Hall in Miami Springs. Mobile roll call began at 1405, and twelve mobiles responded, nine of which were dispatched to "bombed" bridges, others kept on stand-by. Each mobile, upon arriving at destination, dispatched a damage report in standard ARRL form, after which they were redispached to specified councilmen in Miami Springs, many of whom rode along in mobiles during much of the drill. After disaster traffic had been cleared, W4NVU took net control to contact all fixed stations wishing to take part throughout the country, and five additional stations did so.

A recording was made of the whole operation, to be played back later and checked for mistakes in procedure. Publicity was given by both the *Miami Herald* and the *Miami Daily News*. The drill was secured at 1600 EST.

— W4IYT, EC Dade Co., Fla.

The Tennessee SEC, W4RRV, conducted a sectionwide surprise drill on April 21st, to determine how quickly the state-wide AREC could mobilize if necessary. The drill was opened at 1800 EST and terminated at 1924. W4RRV says that cooperation was wonderful, and that when the boys called in, they stood by. The drill was conducted on 3980 and

## NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc.      7140 kc.

3635 kc., and some local activities were reported on both ten and two meters. A total of 65 stations checked in on 3980 kc., six on 3635 and fourteen out-of-state, including stations from Virginia, Alabama, Mississippi, Kentucky and Georgia. Alabama SEC W4TKL said he would have activated his extensive Alabama AREC establishment if it had been a real emergency. SCM W4SCF and PAM W4PFP were both active.

Local nets were also activated throughout the state. In Nashville, EC W4OEZ alerted his AREC gang after getting word of the surprise drill at 1820 CST. Ten stations reported into the two-meter net, which was turned loose at 1910. On ten meters, sixteen stations reported between 1842 and 1855. All this was completely without any advance notice that a drill was to be held.

We think the Tennessee boys deserve a big hand for this spontaneous demonstration of their readiness.

The Communications Section of the Third Mobile Support Group, supported by members of the New Albany (Ind.) Mike and Key Club, gave a communications demonstration to the chiefs of the 20 volunteer fire departments of Jefferson County, Ky., on Monday, May 16th. The exercise

Some local brass inspect the new emergency generator donated to Kerr County, Texas, and the City of Kerrville by the Kerrville Radio Club. Left to right in the picture are W5UNE, W5BEO (EC), County Judge J. R. Leavell and Kerrville Mayor Dr. J. L. Bullard.





was designed to give training to the members of the communications section and to acquaint the fire people with the capabilities and limitations, and to give them a general knowledge of communications, equipment and personnel; also to show them how properly to word messages, which were then transmitted from the president of their association to the various chiefs. Replies came through in most cases. The test was quite successful. The communications picture in Louisville is shaping up right nicely.

— W4BAZ, EC Jefferson Co., Ky.

Seventeen ECs, representing 5710 AREC members, submitted reports for May activities. This represents an increase of seven reports from last year's mark, and over 3000 AREC members represented. An encouraging sign of progress, we'd say. The following sections reported, through their SECs (new sections for the year in italics): Ontario, Western N. Y., Western Fla., *Maine*, South Dakota, Montana, Alabama, Los Angeles, *West Va.*, Minnesota, N. Y. C.-L. I., Oregon, San Joaquin Valley, Eastern Fla., *Nebraska*, Wisconsin, Washington. Twenty-six sections have reported in 1955, only six below last year's total. Midyear summary in October QST.

### RACES News

Some time ago we received a very fine article from W6JAU on the Arcadia, Calif., civil defense emergency radio set-up. W6JAU is not only EC for Arcadia, but also communications chairman for the Arcadia Red Cross Disaster Corps and radio officer for Civil Defense Area D. In Arcadia, civil defense and Red Cross work hand-in-hand with the AREC to form a closely-knit organization to provide any kind of emergency communications called for. They have



14 mobiles, two pack sets and one hand-carried unit, two gasoline-driven generators and necessary fixed station equipment to set up a net control station anywhere in a matter of minutes. Mobility and versatility of equipment are paramount in Arcadia. The fixed net control is K6AQT, located in the basement of the City Hall. Vertical polarization is used by all units to facilitate mobile work.

Arcadia, being the control center headquarters for Civil Defense Area D, has the responsibility of coordinating eleven cities in its area, some of which have similar mobile nets of their own. Those which do not are served by the Arcadia group or that of a near-by or adjacent city. The Arcadia group meets each month and conducts frequent net drills and demonstrations. All members have Red Cross and civil defense identification, including RACES clearances. The group even has a TVI Committee.

A salute to Arcadia and its well-organized establishment of amateurs serving civil defense and the Red Cross!

Recent reports from the City of Baltimore indicate a healthy increase in interest and activity among the RACES group. In addition to participation in "Operation Alert" (see summary elsewhere in this issue of QST), a city-wide radio alert is held the third Friday of each month, with six rigs each putting 30 watts into a ground-plane antenna on 145-147 Mc., working from 1930 to 2130 EDST and working into 120 field units.

These alerts and practice drills pay off, interest-wise, training-wise and civil defense-wise. *Join your RACES group today!*

*Left:* This is part of the Charlotte (N. C.) Civil Defense Net group. The net has about 32 stations on its roll, about 20 reporting into each Sunday drill. In picture, sitting, are W4s FNV AYA BTZ and an SWL; standing are W4s CZR BUA ZQB (EC) REW and WXZ (SCM). *Right:* Andy Clark, W4IYT, served as EC for Dade County, Florida, for a number of years. He is one of the instigators of the Dade Emergency Net. This is Andy at his operating position.

### 1955 FIELD DAY NOTE

Field Day High Claimed Scores will appear in October instead of September QST due to the later scheduling of the contest this year.

### TRAFFIC TOPICS

On the first day of August, we put all present net registration file cards behind a tab marked "Inactive Nets." Since then, nets reregistered, or new nets registered, have been transferred to the "Active Nets" tab. This is regular practice in our net registration department. August 1st is the renewal date. September QST makes the announcement. November QST carries the first net list, followed by supplementary lists in QSTs for January, March and May. The complete, multithumbed net directory comes out in December.

Each year we try to aim at getting nets reregistered a little earlier, but so far we haven't been making it. One big reason for this is that compiling and maintaining the directory is a stupendous job requiring a lot of someone's time; then it must be checked, rechecked and cross-checked before it can be reduced to lithograph process. After that, it must be shepherded through the lithographing room and mail room in competition with regular bulletins like the CD Bulletin, LO Bulletin, Club Bulletins, 'Phone Bulletins, Bulletins about Bulletins, etc. ad infinitum. And because the Net Directory is somewhat voluminous, and getting more so each year, it is often by-passed to get at other bulletins which carry mailing suspense dates.

Each of you can help by getting your net registered *early*. This year, we'd like to start putting together the litho net directory around the first of November, have it completed by mid-November and in the mail by December 1st. We can't do this unless you cooperate by registering or re-registering *now*, and make it a standard practice on someone's part to keep that registration up to date immediately any changes are made.

We have registration cards (Form CD-85) available upon request. They're the same as last year's, and have space for the following information: (1) *Name of Net*; please adopt an official name and stick to it. (2) *Net Designation*, if any; most c.w. nets have designations and some 'phone nets have, such as EAN, TCPN, etc. (3) *Frequency (or -ies)*; give the exact frequency, not just the band. (4) *Days*; tell us *which* days, not how many; "daily" means every day, *including* Sunday. (5) *Manager*; the guy who runs the net, called NCS on some nets; what we want is the call of the head man on the net, to whom any correspondence can be directed. (6) *Time* the net starts and time it ends; please use standard time, and be sure to indicate which time zone. (7) *Direct Coverage*; area covered by regular net members, not through liaisons with other nets. (8) *Purpose* of net; this year, we're not registering social, or rag-chew nets, but only those with an emergency or traffic purpose. (9) *Starting Date*; if an old date, give the year; if a new one, the month and year. (10) *Net Control Stations*; list them; they go on our NCS mailing list to receive Emergency and Traffic Bulletins. (11) *NTS*; indicate whether or not the net is affiliated with the National Traffic System. (12) *Liaisons*; list the nets with which regular liaison is conducted. (13) Name and/or call of the person submitting the information.

Most of this information is transferred to a regular net file card. Original registration cards (the ones you send in) are kept on file for a year, then discarded. Use of the regular registration card is not required, but it's a convenience both to you and to us to use it. If not used, please give us the



information above by card or letter. *Basic* registration is the name of the net, frequency, days and time; without these four essentials, no net will be registered.

We cannot search through bulletins, reports or miscellaneous correspondence for net registration information. We'll use it as we come across it, but to be *sure* your net is registered, make a specific point of sending us the necessary information for that purpose alone.

Only one miscellaneous traffic report this month: The Early Bird Net traffic count for June was 428 messages. Since December 5, 1949, this net has conducted 1480 sessions and handled 23,311 messages.

*National Traffic System.* We seem to need a small "shot in the arm" about reporting. It's natural enough for net reports to fall off during the summer months, but now that NTS is an established institution among organized traffic circles, we'd like to feel that 100% reporting is the customary thing, not the exception. Can we have a bit better consistency in this regard, gang?

June reports:

Net	Sessions	Traffic	Rate	Average	Representation
1RN	25 <sup>1</sup>	277	0.42	11.1	80%
3RN	37	209	0.50	5.6	80.2%
RN5	42	524	0.60	12.5	50.3%
RN6	36 <sup>2</sup>	166	0.26	4.6	...
RN7	49	220	...	4.4	29%
8RN	41	87	...	2	...
9RN <sup>3</sup>	11	150	...	13.6	...
TEN	70	954	...	13.6	51.4%
TRN	14	46	...	3	66.7%
EAN	23	716	0.97	31	93.5%
Sections <sup>4</sup>	300	1359			
TCC-Pacific		189			
Summary	648	4907		7.6	EAN
Record	648	8183	...	15.9	...
Late reports:					
RN7 (May)	48	299	...	6.2	37%

<sup>1</sup> Out of 26 sessions held

<sup>2</sup> Out of 44 sessions held

<sup>3</sup> Report by W9DO of 11 sessions for which he was NCS.

<sup>4</sup> Section nets reporting: KYN (Ky.); CVN (Calif.); QKS, QKS-SS and QKN (Kans.); MON-SMN (Mo.); CN and MCN (Conn.); NTX (N. Texas); WVN (W. Va.); AENB & AENP (Ala.); GSN (Ga.).

A complete list of NTS net managers at regional and area level may be in order; it has been quite some time since one was presented here:

*Area Nets:* Eastern Area Net—W8SCW; Central Area Net—W9JUU; Pacific Area Net—W7APF.

*Regional Nets:* 1RN—W1BVR; 2RN—W2LPJ; 3RN—W3NRE; 4RN—W4BVE; RN5—W4OGG; RN6—W6ZRJ; RN7—VE7ASR; 8RN—W8DSX; 9RN—W4KKW; TEN (Tenth Regional Net)—W0DQL; TRN (Thirteenth Regional Net)—VE3GI. The Eleventh and Twelfth Regional Nets have never materialized, being originally intended for the Mountain Area. These nets were absorbed into the Seventh and Sixth Regional Nets respectively and report into the Pacific Area Net.

*Transcontinental Corps:* Eastern Area Director—W8UPB; Central Area Director—W9JUU; Pacific Area Director—W6HC (until September 30th).

Maine and W. Mass. made perfect attendance in 1RN during June. W4OGG reports that morning sessions (0600 CST, 3645 kc., Mon. through Sat.) are still going strong. RN6 has good representation from California sections, not so good from others; a very fine RN6 Bulletin was issued in July. W9DO reported his eleven sessions of 9RN, and is filling in until new manager W4KKW takes hold. TEN conducts a session at 1700 CST in addition to the regular sessions at 1945 and 2130. VE3GI reports that VE2DR is holding down Quebec representation to TRN single handed, that Maritimes coverage is very spotty, and that the use of 7070 kc. has been dropped as of August 1st.

W6HC indicates that the following TCC stations submitted reports for June: W0KQD, W7CCL, K6BDF, W6ADB, VE7QC, K0WBB, W6IPW. Total traffic reported amounted to 189. Many TCC stations are off for vacations. W6HC announces his resignation as TCC Director effective September 30th due to the pressure of other business.

## BRASS POUNDERS LEAGUE

winner of BPL Certificates for June traffic:

Call	Orig.	Recd.	Ret.	Del.	Total
W3WUQ	195	904	1021	73	2193
W3CUL	61	644	509	117	1331
W9NZZ	300	464	2	458	1224
W0CPI	24	579	512	67	1182
W3WG	67	533	494	36	1130
W7PGY	14	546	523	23	1106
W7BA	11	546	529	16	1102
W0BDR	62	519	485	7	1073
W0PZO	0	452	442	8	902
W0SCA	15	453	432	1	901
W4PFC	5	450	420	15	890
W9DO	13	359	315	47	734
W7VAZ	3	356	332	24	715
K4AKP	8	301	279	23	611
W9TT	1	294	250	0	545
W9GAR	11	248	250	9	518
W6TTX	50	234	232	1	517
W4PUJ	4	256	230	26	516
W3WV	7	268	206	34	515
W4OGG	11	248	237	5	501

### More-Than-One-Operator-Stations

W4CFJ	20	2160	1940	240	4360
W6IAB	37	1272	1199	73	2551
W6YDK	32	741	689	52	1514
K5FFA	34	236	241	9	520
Late Reports:					
K5PHU (May)	10	587	511	11	1119
K5FCJ (May)	103	328	311	17	759

### BPL for 100 or more originations-plus-deliveries:

K4ASU	184	W0RLQ	108	W1CDX	101
W4PIM	142	W0GAH	108	Late Reports:	
W9VEY	132	W5UBW	107	VE3DPO (May)	120
KP4WT	113	W4HDR	105	W0YNC (Mar.)	114
W6MBW	111	W4KKW	103	W0NVU (May)	112

BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: K2BJS, W3WG, W4COU, W4HDR, W8DAE, W0PZO.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies, within 48 hours of receipt, in standard ARRL form.

## HOBBY SURVEY

In a recent ARRL field organization survey asking about "any other hobbies" and "your favorite contest," answers came from all classes of appointees. Results apply in the main to the field organization group, of course. The typical appointee-operator has an input of 236 watts and operates 43 hours per month. His interest in broad terms shapes up as follows: 30% traffic, 30% rag chewing, 22.3% DX, 17.7% construction.

Favorite contest? Looking at the "big four" in ARRL affairs it came out like this: SS 40.4%, FD 31.9%, DX Competition 19%, V.H.F. SS 8.7%. The one favorite band? 80 got 68% of the votes, 40 got 15%. Looked at from the standpoint of all-band use the bands looked as follows: 160 2.2%, 80 38.7%, 40 20.5%, 20 18%, 15 5%, 11.4%, 10 6.6%, 6 1.7%, 2-and-above 6.9%. Half the gang used two favorite bands most of the time. Over a quarter of the gang have just one favorite band. Few use over three bands. 25% had emergency power for a home emergency station; 37% had mobiles. Answers about interests included such expressions as "What other hobby could there be?" "Are you kidding?" "Who could afford another?" "No favorite contest, I love 'em all." 20% insisted there could be no other hobby interest than amateur radio. But this group was outnumbered by those with other interests.

It is said that a man is fully alive only in proportion to his interests. There is a lot in that view but we amateurs have very little to worry about . . . to judge from the survey of other hobbies. We found over 100 hobbies listed by name! No indication of hobby-time for these other things was indicated. However, a variety in interests, the balanced life our *Amateur Code* indicates is by most standards rich in the things that make for contrast and triumphant living values. Seventy percent of our gang engage in five most popular additional hobbies among the one hundred: (1) photography 32%; (2) fishing 9.7%; (3) music 7%; (4) stamps 6.6%; (5) hi-fi 5.8%. Others run the gamut from bird watching and skin diving to breeding peonies, raising parakeets, canaries, tropical fish, dogs, keeping bees and building models. There's hardly any amateurs *don't* do when it comes to other hobbies, too!

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

## ATLANTIC DIVISION

**EASTERN PENNSYLVANIA**—SCM, Clarence Snyder, W3PYF—SEC: NNT, RM: AXA. PAM: TEJ. E. Pa. nets: 3610, 3850 kc. In an effort to reorganize the AREC in Eastern Pennsylvania, NNT, newly-appointed Section Emergency Coordinator, is looking for ECs for the following counties: Adams, Bradford, Bucks, Carbon, Columbia, Cumberland, Dauphin, Delaware, Juniata, Lebanon, Lehigh, Lycoming, Monroe, Montour, Perry, Pike, Schuylkill, Snyder, Sullivan, Susquehanna, Tioga, Union, Wayne, and Wyoming. If your county is not represented, contact NNT and he will be happy to consider you for appointment. If you formerly held an EC appointment and it has lapsed and you wish to be reinstated, notify him and help build a bigger and better AREC in Eastern Pennsylvania. Talk it up before local amateur radio clubs and come up with your suggestion for the appointment. WUE has been aiding the New York State Civil Defense Net by monitoring 3993 kc. while radiological information is being passed, by standing by to QSP when skip conditions prevent direct contact. VUH is a member of the North Penn. ARC when he is home from his Army duties in Germany. His call there is DL4BX. JKH was married in June and honeymooned in Europe. MDO reports a new club in the Stroudsburg Area, the Pocono Amateur RC. Officers are MDO, pres.; MAA, vice-pres.; ZIV, secy.; and UCY, treas. The Club is working toward ARRL affiliation. VZJ, VRN, and KTO provided communication during the c.d. drill in Wyoming Valley. The Reading Radio Club, operating the Berks County C.D. trailer, PFT/3, furnished communications from the Reading Airport during the Women's Powderpuff Air Races. Stations operated from dawn to sunset on 3970 kc. for handling reports. BHC has been named deputy communications director for c.d. in Northumberland County. New OPS: OK and BNR. BNR is alternate NCS on the Interstate 'Phone Net. BIP has the new shack completed and ready for the opening of the E. Pa. nets. BUR reports eighteen 2-meter stations for the Centennial Parade. The Eastern Pennsylvania C.W. Net and the Pennsylvania 'Phone Net held a picnic at Hershey Park, Hershey, on Aug. 14th. Traffic: W3CUL 1331, YDX 355, WUE 228, BNR 187, TEJ 159, OZV 81, BFF 78, OK 73, DUI 65, PYF 33, EAN 20, ELI 19, PVY 19, BUR 16, UOE 11, UWP 11, EU 6, WQL 6, ZRQ 6, DGM 4, WJM 4, JNQ 3.

**MARYLAND DELAWARE-DISTRICT OF COLUMBIA**—SCM, John W. Gore, W3PRL—From the viewpoint of the SCM's visits to the many areas within the section, and also reports, and despite the inclement weather Saturday afternoon and night, which did not seem to dampen the ardor or enthusiasm, this section should in the final analysis show exceptional results in the Field Day Contest. Operation Alert resulted in considerable activity by amateur groups; typical examples being the Hagerstown group with OYX, OXL, JVZ, TJV, and YRK on the local net frequency of 3827 kc. tying into State C.D. Headquarters on 3820 kc., and St. Mary's group with BUD at C.D. Headquarters at Leonardtown handling the local net, consisting of ADQ, PPY, AVL, and ZZZK, who operated both fixed and mobile. ZZZK and AVL also relayed traffic via 2 meters to N3ZYB in Calvert County. The Governor having proclaimed the week of June 19-25th as "Radio Amateur Week," it was decided that it would be appropriate to hold a Victory Dinner in celebration of the signing of the Maryland License Plate Bill. This dinner was held June 22nd at the Park Plaza where those who were active in securing backing for the Bill, as well as Senator Dempsey of the Legislature and other guests, were present. CARC members NH, UYJ, LZZ, BYG, CJN, and KOU totalled 1064 points in the 1955 V.H.F. QSO Party on 2 meters. The Harford County C.D. Net is rapidly progressing in both attendance at regular drills and installation of

equipment at the local headquarters at Bel Air. Those participating regularly are SCPN/m3, K2GDH/m3, LDD/-m3, 0MZN/m3, 00KI/m3, and /3, 9Q0I/m3 and /3, RMY/3, SZY/3, UCR/3, 2YAY/m3, and 5ZOG/3 and /m3. The V.H.F. Contest of June 11-12 found CIQ and RAH operating at Gambrell State Park under CIQ, where they worked 101 stations in 6 sections. BNC, EPV, and VAM operated from their own QTH in the Hagerstown section. The Hagerstown group mustered 20 members participating full time, with others helping during their available hours during Field Day, and over 800 contacts were made. ECU has completed his 813 final and will operate on 40 and 20 meters. MCQ has acquired a 5-kw. gas-engine generator for emergency use after he returns from a month's trip to New Mexico. WV reports unexpected level of activity on the MDD Net during the early part of the period. HKS has a Viking Ranger. WC surprised himself with the operation of his 4-watt brief-case portable on 75-meter c.w. and 'phone. RV reports the Andrews Air Force Base Wind Bag Net now is operating on 7240 kc. The Radio Engineers Club of CREI in Washington is on the air with a kw. and the club call YXMI. EQK probably has reported from more remote locations by mobile into the MEPN than any other member. His latest accomplishment was to report in on his marine mobile from the upper Chesapeake Bay. AVL and BH have operated on the air with s.s.b. YYB and YYP, George and Merle, a father-and-son combination, completed their 10-meter beam on July 4th and are looking forward to highly increased activity. Their first contacts on the new beam were with stations in Bermuda and Puerto Rico. PGB is back on the air after a delayed recovery from "Hazel." Traffic: (June) W3WG 1130, WV 515, UE 112, MCQ 76, RV 66, PRL 41, UCR 37, BUD 25, WAF 10, OYX 8, PO 4, (May) W3MCQ 80.

**SOUTHERN NEW JERSEY**—SCM, Herbert C. Brooks, K2BG—SEC: ZVW. PAM: ZI. K2JEI has a new vertical on 40 meters. ZAS also is breaking in a new antenna. HDW reports less traffic this month because of the arrival of a new harmonic. K2JKC is a new traffic-handler who soon will be an ORS. State Headquarters RACES station was manned during "Operation Alert" by VQR, ZI, and SXX. More than 100 messages were handled during the test. The 6-meter net continues to hold weekly skeds every Mon. at 2030. Newcomers are always welcome. Burlington County Radio Club members are operating their club station, K2KED, and Area 10 RACES station on alternate Fri. nights. Area 11, Camden County, also holds drills on this night. SJRA Field Day totals topped those of previous years. The JP Net also was active on Field Day. ASQ has a new beam and a new transmitter. K2DZL is hospitalized. Don't forget those cards; Ben will appreciate your get-well wishes. K2MHD is Superintendent of Police, Allentown, N. J. HAZ is on the sick list. Hope you will be well soon, Bill. The SJRA is planning a bigger and better hamfest and picnic than ever. Contact CAG, the chairman, for details. UNT is doing FB with a QRP rig on 2 meters mobile. We need more mobile units in our present RACES and AREC drills. If you are not taking part in these drills, contact your EC or SEC for assignment. LS, VMX, and K2CPR continue to do swell jobs as Official Observers. The Burlington County RC has applied for League affiliation. Traffic: (June) K2HZR 254, W2RG 173, K2JKC 88, W2ASG 9, ZI 7, K2CPR 3. (May) W2HDW 14.

**WESTERN NEW YORK**—SCM, Edward G. Graf, W2SJV—Asst. SCM: Jeanne Walker, 2BTB. SEC: UTH/FRL. RM: RUF. PAMs: TEP and NAI. NYS c.w. meets on 3615 kc. at 6 p.m. and 6:30 a.m.; NYSS on 3595 kc. at 5:30 p.m.; NYS 'Phone on 3925 kc. at 6 p.m.; NYS C.D. on 3509.5 and 3993 kc. at 9 a.m., Sun.; TCPN 2nd call area on 3970 kc. at 7 p.m.; SRPN on 3970 kc. at 10 a.m.; ISPN on 3980 kc. at 3 p.m. At an ARATS meeting slides on A.C. Current and Its Application were shown with RPO explaining; also slides of the vacation trip of SEX to Florida. Hams in Clinton are forming a club. Contact KN2KXE for details. Other Novices in the city are LAN and OKK. A W.N.Y.S. Ont. V.H.F. "do" under the sponsorship of the Lockport ARC was held in that city. The feature of the evening was MTU of Cornell U., on "VHF Echoes from Aurora." SJV was the guest of ZOL and BTB at a meeting of the RAGS in Syracuse. The program was a paper given by ZGY, Inst. Eng. of G.E., on "Fundamental Measurements." MTU will be on 420, 144, and 50 Mc. from Colorado. TTU is going to Alaska with the AF. The c.d. fellows in Ithaca and Elmira are going strong on 2 meters. BTB received a Public Service award for her work in "Hazel." Officers of the Batavia ARC are HJN, pres.; IIE, vice-pres.;

(Continued on page 78)



**I**N February of this year we made our first appearance on this page. In the intervening months we have tried through this means to open the doors of Hallicrafters engineering laboratories to thousands of hams throughout the world. We hope we have been of service to you in the growing field of single sideband with articles on receivers, exciters and amplifiers. As the world's largest manufacturer of ham equipment, we will continue to cover these and other technical subjects in the future.

**B**UT let's look back for a moment on what has happened in the way of product development since February. We introduced the SX-96 with selectable sideband which promises to be the most popular medium priced receiver ever produced. In recent months the HT-31 linear amplifier made its appearance, giving "talk power" equivalent to a kilowatt of AM in a compact, table-top package.

**O**THER new and exciting products have been engineered for you, the hams.

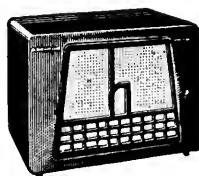
**A**N extremely stable filter-type AM-CW-SSB transmitter/exciter (model HT-30) will be available soon. A new receiver (model SX-100) incorporating the highlights of the SX-96 — and then some — is in production. A complete, highly styled console made up of the HT-30, HT-31 and SX-100 — ready to operate — is planned for later this fall.

**I**MMEDIATELY available for ham, novice and short-wave listeners are popular receivers like the S-38D, S-53A, S-85, SX-99 and SX-62A. For industrial, emergency and Civil Defense use we have the low cost S-94 and S-95 FM receivers as well as our deluxe "Littlefone" two-way radio telephones.

**T**HE parade of new products will continue in 1956; but in this brief report we wanted to keep you posted on our plans for the immediate months to come. We hope that your plans will include Hallicrafters equipment.

*Bruce Hallicrafters Jr. W. J. Hallicrafters W9AC*

for **hallicrafters**





# New

# Heathkit VFO KIT

MODEL VF-1

**\$1950**

Ship. Wt. 7 lbs.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical

and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

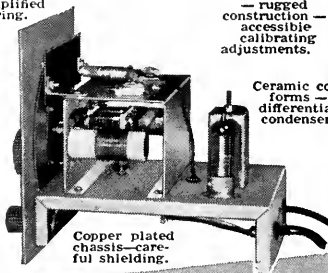
This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard 1/4" crystal holder. Construction is simple and wiring is easy.

- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OAZ voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

Open layout, — easy to build — simplified wiring.

Smooth acting illuminated dial drive.

Clean appearance — rugged construction — accessible calibrating adjustments.



Ceramic coil forms — differential condenser.

Copper plated chassis—careful shielding.

## Heathkit AMATEUR TRANSMITTER KIT



MODEL AT-1

**\$2950**

Ship. Wt. 16 lbs.

### SPECIFICATIONS:

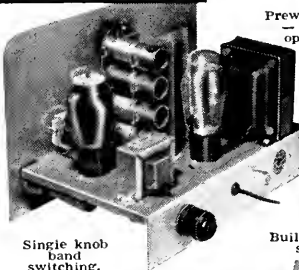
Range 80, 40, 20, 15, 11, 10 meters.  
6AG7 ..... Oscillator-multiplier.  
6L6 ..... Amplifier-doubler  
5U4A ..... Rectifier.  
105-125 Volt A.C. 50-60 cycles 100 watts. Size: 8 1/8 inch high x 13 1/8 inch wide x 7 inch deep.

Crystal or VFO excitation.

Prewound coils — metered operation.

52 ohm coaxial output.

Rugged, clean construction.



Single knob band switching.

Built-in power supply.

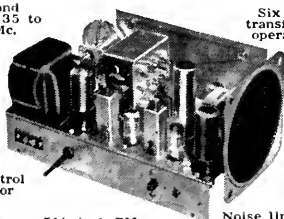
Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

## Heathkit COMMUNICATIONS RECEIVER KIT

Four band operation 535 to 35 Mc.

Stable BFO oscillator circuit.

RF gain control with AVC or MVC.



5 1/2 inch PM Speaker-Headphone Jack.

Six tube transformer operation.

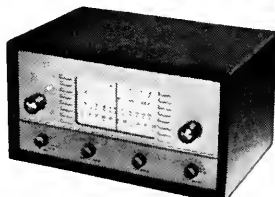
Electrical bandspread and scale.

Noise limiter—standby switch.

### SPECIFICATIONS:

Range.....535 Kc to 35 Mc  
12BE6 ..... Mixer-oscillator  
12BA6 ..... I. F. Amplifier  
12AV6 Detector—AVC—audio  
12BA6 ..... B. F. O. oscillator  
12A6 ..... Beam power output  
5Y3GT ..... Rectifier  
105-125 volts A.C. 50-60 cycles, 45 watts.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.



MODEL AR-2

**\$2550**

Ship. Wt. 12 lbs.

### CABINET:

Proxylon impregnated fabric covered plywood cabinet. Shpg. weight 5 lbs. Number 91-10, \$4.50.

**HEATH COMPANY**  
BENTON HARBOR 9, MICHIGAN

## New HEATHKIT DX-100



MODEL DX-100

Shpg. Wt. 120 lbs.

**\$189.50**

Shipped motor freight unless otherwise specified. \$50.00 deposit with C.O.D. orders.

- R.F. output 100 watts Phone, 125 watts CW.
- Built-in VFO, modulator, power supplies. Kit includes all components, tubes, cabinet and detailed construction manual.
- Crystal or VFO operation (crystals not included with kit).
- PI network output, matches 50-600 ohms non-reactive load. Reduces harmonic output.
- Treated for TVI suppression by extensive shielding and filtering.
- Single knob bandswitching, 160 meters through 10 meters.
- Pre-punched chassis, well illustrated construction manual, high quality components used throughout—sturdy mechanical assembly.

## PHONE AND CW TRANSMITTER KIT

This modern-design Transmitter has its own VFO and plate-modulator built in to provide CW or phone operation from 160 meters through 10 meters. It is TVI suppressed, with all incoming and out-going circuits filtered, plenty of shielding, and strong metal cabinet with interlocking seams. Uses pi network interstage and output coupling. R.F. output 100 watts phone, . . . . . 125 watts CW. Switch-selection of VFO or 4 crystals (crystals not included).

Incorporates high quality features not expected at this price level. Copper plated chassis—wide-spaced tuning capacitors — excellent quality components throughout—illuminated VFO dial and meter face—remote socket for connection of external switch or control of an external antenna relay. Preformed wiring harness—concentric control shafts. Plenty of step-by-step instructions and pictorial diagrams.

All power supplies built-in. Covers 160, 80, 40, 20, 15, 11 and 10 meters with single-knob bandswitching. Panel meter reads Driver Ip Final Ig, Ip, and Ep, and Modulator Ip. Uses 6AU6 VFO, 12BY7 Xtal osc.-buffer, 57C3 driver, and parallel 6146 final. 12AX7 speech amp., 12BY7 driver, push-pull 1625 modulators. Power supplies use 5V4 low voltage rect., 6AL5 bias rect., 0A2 VFO voltage reg., (2) 5R4GY hi voltage rect., and 6AQ5 clamp tube. R.F. output to coax. connector. Overall dimensions 20 7/8" W x 13 3/4" H x 16" D.

## Heathkit ANTENNA COUPLER KIT



MODEL AC-1

**\$14.50**

Shpg. Wt. 4 lbs.

Poor matching allows valuable communications energy to be lost. The Model AC-1 will properly match your low power transmitter to an end-fed long wire antenna. Also attenuates signals above 36 Mc, reducing TVI. 52 ohm coax. input—power up to 75 watts—10 through 80 meters—tapped inductor and variable condenser—neon RF indicator—copper plated chassis and high quality components.

## Heathkit GRID DIP METER KIT



MODEL GD-1B

**\$19.50**

Ship. Wt. 4 lbs.

The invaluable instrument for all Hams. Numerous applications such as pre-tuning, neutralization, locating parasites, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1 1/4 meter Ham bands. Complete frequency coverage from 2—250 Mc, using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at \$3.00 extends low frequency range to 350 Ke. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

## Heathkit ANTENNA IMPEDANCE METER KIT



MODEL  
AM-1

**\$14.50**

Shpg. Wt. 2 lbs.

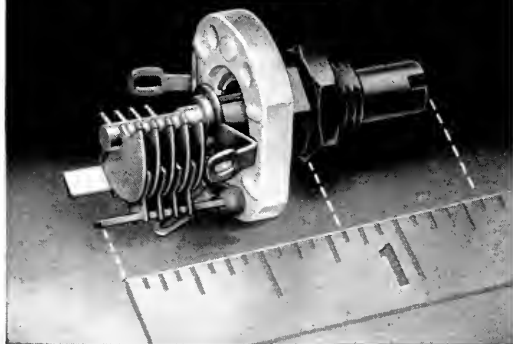
Use the Model AM-1 in conjunction with a signal source for measuring antenna impedance, line matching purposes, adjustment of beam and mobile antennas, and to insure proper impedance match for optimum overall system operation. Will double, also, as a phone monitor or relative field strength indicator.

100  $\mu$ a. meter employed. Covers the range from 0 to 600 ohms. Cabinet is only 7" long, 2 1/2" wide, and 3 1/4" deep. An instrument of many uses for the amateur.

**HEATH COMPANY**  
A SUBSIDIARY OF DAYSTROM, INC.  
BENTON HARBOR 9, MICHIGAN



# "LITTLE MAC" does a big job!



## Ideal trimmer for VHF range

To keep pace with the continuing efforts of the electronic industry toward miniaturization of components, Hammarlund has introduced a tiny variable capacitor, type "MAC". This component provides the low minimum capacity essential for use as a trimmer in the VHF range.

The silicone-treated base is only  $\frac{3}{4}$  x  $\frac{5}{8}$  inches. Its rotor and stator are soldered assemblies of brass, nickel-plated for low losses, while the wiper rotor contact is nickel-plated beryllium-copper. Rotor and stator terminals are positioned to permit short leads. A threaded bearing is provided with flat sides to permit single-hole mounting without turning.

The new units are available to fulfill capacity requirements between 1.4 and 19.6 mmf. Try one in your next piece of gear.



If you haven't received your copy of the Capacitor Catalog, write to The Hammarlund Mfg. Co., Inc., 460 W. 34th St., New York 1, N. Y. Ask for Bulletin C9

# HAMMARLUND

(Continued from page 74)

K2DVC, secy.; TON, treas. "Gadget Nite" was held by the KBT Club. SJV spoke at an RAWNT meeting on AREC and c.d. The RARA V.H.F. meeting was held at the QTH of UXP. New officers are K2CEH, chairman; BCL, vice-chairman; ZS, secy. The SRPN picnic was held at Schoharie with NAI in charge of arrangements and prizes. FCD is going overseas with the AF. New officers of the Watertown ARC are K2GWN, pres.; FDI, vice-pres.; KN2JDE secy.; K2DUO, treas. The Club was commended highly by the c.d. director on its participation in the recent c.d. test. All members are in RACES. K2DVC, EC and RO for Genesee County, reports the C.D. Director, Mr. Clement, was pleased and impressed with their work in the c.d. test. All amateurs should make a special effort to obtain newspaper publicity in such matters, keeping Amateur Radio for Public Service before the public. The XYL of GBX received the call KN2OBX. K2GVJ set up a B&W for demonstration in communications for the local 6th graders. KN2ORF is a sergeant in the AF. EMW renewed as ORS. The Syracuse V.H.F. Club received nice publicity in the *Syracuse Herald-Journal* for Field Day activity. K2KIR is interested in getting a teen-age net going on 3720 kc. Contact Junior on that frequency. OWF, ILQ, HWC, SNI, UTH, and K2CEH are quite active on 6 meters. Traffic: W2RUF 333, ZRC 191, K2AMZ 126, OE 53, ZLT 42, GBX 36, HKA 36, DSR 34, RUT 27, FEB 20, SJV 17, DSS 14, WS 10, K2KIR 4.

**WESTERN PENNSYLVANIA**—SCM, R. M. Heck, W3NCD—SEC: GEG. RMs: UHN, NUG, NRE, and GEG. PAMs: AER and VKD. UJP reports the Breeze Shooters Hamfest was a success with 358 hams registering, plus the XYLs, SWLs, and jr. operators. The prizes were all given out, with 81QT, 3NCP, NJO, and MWG getting away with the main ones. The lectures, books, and other entertainment moved smoothly. JT entertained W0ENQ. ZUS now has a VFO. The BSN ground-wave contest unofficially reports 22 logs, 89 contacts, 180 miles, DX between VWA and SRUV. VEK recently was discharged from the Army. Sixty-six hams participated in the Allegheny County C.D. Drill. One net control completely mobile was PIQ/3. UHM and OUA are working on Scott Township C.D. ZDW is working DX on 20 meters. OKU is s.s.b. on 40 meters. The 2- and 6-meter beams are up at the SCARC's KWH. VKD had as visitors KA2DV, F7CV, BDQ, and UHN. The Indiana ARC was in Field Day with about 40 hams operating BMD/3 all bands at 60 watts making 320 QSOs. BRC is heard on 20-meter 'phone. From RAE: YXE dropped the "N" from his call and joined the 10-meter net. YKE was first in Erie with a DX-100 aired. WDK is getting nice signals from his also. The Erie Novice Net is set up by WN3ZNY Sun. at 1:00 P.M. on 3705 kc. SUK now is on 50 Mc. with 100 watts and a four-element beam. 81JG reports the SUK 220-Mc. n.f.m. signals get through the QRM better than his a.m. some 50-Mc. QSOs from Burgettstown were 5HEZ, 4FBL, 0MUG, and VEIEF. SUK is a new OES in the section. Traffic: W3WUQ 2193, UHN 25, KNQ 12, VKD 7, KUN 6, UTR 6, NCD 5.

## CENTRAL DIVISION

**ILLINOIS**—SCM, George T. Schreiber, W9YIX—SEC: HOA. RMs: BUK and MRQ. PAM: UQT. Cook County EC: HPG. Section nets: IEN 'phone, 3940 kc.; ILN c.w., 3515 kc. New Novice calls heard are AGU, RSY, UGA, and YCF. New General Class licenses are OFF and PND. Congratulations to the Elgin Radio Amateur Service Club and the Peoria-Area Amateur Radio Club on their affiliation with ARRL. MZW, formerly of Herbert, has bought a new home in Rockford. The St. Clair Amateur Radio Club really is going great guns in c.d. work, conducting drills weekly, planned by Novice RSY. MKN is back on mobile. JSQ checks in a MARS Net each Tue. night and then dashes madly to St. Louis to attend Naval Reserve drill. UWP is punching holes in the ionosphere with his new Elmac. KCV soon will be operating with a foreign call, per Uncle Sam's orders. BA writes a newsy letter on doings downstate; we wish we had space to reproduce in full. HPG was the only OO in the section to participate in the May F.M.T. What's the matter, NN and PBI? PHE is back on the air after extensive repairs. The CWC Amateur Radio Club is interested in c.d. work and is trying to work out a program with HOA, the Section Emergency Coordinator. KCW reports that during the recent c.d. test, 47 stations checked into the Watch Dog Net on 2 meters. BPU enjoys tuning his new Collins receiver and using his 10-16-20 beam. KLD has a new 829B final for 2 meters. NKR skeds Greenland daily on 20 meters. QGO and FHK returned from W6-Land. SKR's latest project is a grounded-grid amplifier using an 837. NIU is happy he had to overhaul the SRRC Field Day generator only once during the session. Are you more than 50 years old? Then you are eligible for the 3940 Over The Hill Club. Ask VXS. GDI is back to the air waves, having gotten fishing out of his system for the year, but GAS brags he has not been on the air for a year because of the same sport. VEY has a radio family. His son is EZA and his daughter recently was licensed as KN9AMD. Evidently Field Day in the section was a big success. We received Field Day messages from fifteen stations, all operating portable in the test.

(Continued on page 80)



**After three years engineering and design time...**

➔ *The NEW*

# PRO-310



Three years ago, Hammarlund set out to design and build an amateur receiver that would provide absolutely the last word in performance. And here it is—the **NEW Pro-310**.

This rig was designed with performance in mind. We've not cut corners. Frequency readings can be read to 1 part in 5000; the bandspread can be continuously calibrated over the entire range; it is exceptionally stable; construction is sectionalized; and many other features

are built in to give one thing—top performance.

If you've longed for a receiver that's as modern as this minute, you want a new Pro-310. Look it over at your dealers'. If he doesn't have one now, he'll be getting his stock soon. Get specs and other information either from him or by writing The Hammarlund Manufacturing Co., 460 West 34th Street, New York 1, N.Y. Ask for Bulletin R-9.



## HAMMARLUND

*Since 1910*

They are ABI, BA, DNN, DOP, HKA, IAW, NOZ, NZ, PCS, QLZ, TBP, THT, VSX, WJF, and YHP. If your station is not listed above, get after the chap you relayed to. Comes the cooler weather we are going to make an attempt to bring leadership appointments up to date. Please look at the dates on your certificates and if old, mail to your SCM for authentication. Traffic: (June) W9DO 734, CSW 183, VEY 144, BUK 109, YIX 52, VHD 44, CTZ 42, KLD 40, VSX 36, SME 82, LXJ 26, QQG 25, CZB 23, CEE 22, MRQ 19, VER 11, LL 9, BPU 6, BA 4, PHE 3, OR 2, JMC 1. (May) W9VER 26.

**INDIANA** — SCM, George H. Graue, W9BKJ — A state-wide contest sponsored by the Indiana Radio Club Council (IRCC) was partly responsible for the large club station activity in Field Day. A plaque goes to the winner. Field Day messages addressed to the SCM were received from AB/9, EIV/9, GHA/9, HSP/9, KOY/9, LDT/9, PRD/9, REG/9, RNC/9, UC/9, and UPI/9. CAEN reports 20 sessions with traffic of 29. WWT reports RFN traffic of 197. NTA reports for IFN with a traffic total of 235. Brass Pounders for the month are NZZ and TT. KLR has moved and is active again on 2 meters. JYQ has an s.b.b. exciter. New at East Chicago is N9AJY, the XYL of IBZ. NNT is in the hospital. VPJ has a new Hallcrafters. ELR is helping Novices prepare for the General Class exam. New at Kewanee are N9ADN, ADP, and AIL. New at Plymouth are N9AGF and AGG. CEA had a big write-up in the Wabash paper pertaining to his EC work. CKR is convalescing. BRM off to serve Uncle Sam. HRH is leaving Evansville. EHU received his DXCC. The TARS furnished communications for the Eagles Parade. Assisting were BRN, WQC, ABW, 4HKT, AML, and RYM, all on 29.6-Mc. mobile. Orr PAM, NTA, reports the following stations logged on Operation Alert in this section: AAY, AB, AQR, ASX, AYP, CBR, CC, CDW, CEA, CMT, CTF, DFW, DOK, DPT, DUD, EAE, EGQ, EHZ, ELR, EQO, GRN, HSG, JJC, JLG, JWI, JYO, KDV, LIT, LZL, MDC, NSX, NTA, OLL, PAS, PMT, PRO, PUE, QBD, QYQ, RJY, RGS, SAL, UB, UMS, UQQ, VNP, VNV, VSH, WBH, WIL, WRG, YEA, YVS, ZKW, ZRP, and ZTN. EGQ, LZL, and VSH are cited for outstanding work on this test. Vigo County has a 50-watt link unit as net control on 50.58 Mc. and 15 mobiles on that frequency. NH is keeping a weekly schedule with his brother 6GYK. AQR has moved to Tipton. DKR has a 9-watt mobile. N9AKE is new in Jeffersonville. ADW has a new rig and antenna. WWT reports that RFN handled 81 pieces of traffic, making a total of 313 pieces of traffic handled by IFN and RFN on the c.d. test. WAU has a DX-100. WTY has a Viking II. UQP has a 1-watter that gets out. Ye editor of *Ham News* visited NZZ, BKJ, and CLF. AB has the BC-610 working again and is on IFN regularly. Traffic: (June) W9NZZ 1224, TT 545, WWT 212, UQP 142, AB 136, CTF 105, TQC 103, EHZ 100, NTA 96, ZYK 88, WRO 76, JBQ 72, QYQ 72, WBA 50, BKJ 44, LIT 44, STC 43, EQO 37, VNV 31, PQA 26, JYQ 25, SVL 23, CMT 19, ZIB 19, CC 17, HRY 17, QR 16, AQR 10, DKR 10, DOK 10, ALL 8, AZF 8, GDL 5, BDP 4, NH 4, FGX 3, YVS 3, HSG 2, UWU 1. (May) W9AB 34.

**WISCONSIN** — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAMs: ESJ and GMY. RMs: IXA and RTP. Nets: WIN, 3685 kc., 7 P.M. daily; BEN, 3950 kc., 6 P.M. daily; WPN, 3950 kc., 1215 Mon.-Sat., 0930 Sun. Wisconsin Mobile and c.d. frequency: 29,620 kc. UTV renewed ORS appointment and is on with a Viking Ranger. RQK has been doing some c.w. work this summer. New officers of the Fond du Lac Mike & Key Club are: LUQ, pres.; DIA, vice-pres.; VIK, secy.-treas. DIK got Nevada to complete his WAS. 7ZHT (ex-9KJM), now in Nevada, was back in Wisconsin during his vacation. IIB is designing a new high-power mobile. The BEN picnic was held at Waterloo July 10th. Some choice DX worked by RKP includes 4X4DF, OY2Z, SU1IG, ZM6AS and CT2BO. CCO is in the market for some mobile gear. WLW has a new Viking KW on the air. The Polecat Net Picnic was held at Green Lake June 12th. IIU is building 144-Mc. equipment. WN9UMK is building 144-Mc. converter. Rhinelander was host for the July meeting of WVRA (Wausau). We regret to report UIM as a Silent Key. QCH received his WAS certificate, and is busy on 4-Mc. s.s.b. with a 10A and Viking II. BNC is on 7-Mc. c.w. from his new trailer house. JEF, with 90 watts on 'phone and 200 watts on c.w., needs only Arizona for WAS. ANA can be heard from Yuma, Ariz., on 14,235 kc. YWI has a new SX-96. The mobiles of RBI, PYE, TRU, HMG, and IHB were active in the June C.D. Test with UTV, UGT, and MQK at the control station. A net certificate (WPN) was issued to SJL. Active in Field Day: SWQ, Madison; AIQ, Sturgeon Bay; HRM, Milwaukee; NUW, Wausau; SLT and ZGW, Eau Claire; RQQ, Crandon; UDU, Racine; DIK, Fond du Lac; DSP, Chippewa Falls; RQN, Superior; BXM, Marshfield; TCH, Beaver Dam. Weekly drills for stations licensed in the Wisconsin RACES net are held at 8 A.M. All ECs are requested to secure full participation in this activity. See you at the Central Division Convention, So. Bend, Ind., Oct. 15-16. Traffic: W9CXY 392, SAA 125, UTV 83, YZA 36, NUW 30, GMY 24, RQK 19, RQM 18, DIK 7, AJU 5, CCO 3, RKP 3, IIU 2, MUM 2, WN9UMK 2, W9WLW 2, IAL 1.

## DAKOTA DIVISION

**SOUTH DAKOTA** — SCM, J. W. Sikorski, W0RRN — Asst. SCMs: Earl Shirley, 0YQR, and Martha Shirley, 0ZWL. SEC: GCP. PAMs: GDE, BNA, NEO, and PRL. RM: SMV. LXD has moved from Sisseton to Centerville and will be in business with his father. Incomplete reports indicate that more South Dakota stations operated in Field Day than in any previous contest. SCT now is a member of AF MARS. RRN and family vacationed in Indiana and Illinois. NAB and BJH have built 6-meter mobiles. Net reports: C.W. Net, 13 sessions, 82 QNI, QTC 43; 75-Net, average QNI 31, average daily QTC 6. NAB has a new daughter. Very few reports were received this month. Please help out your new SCM, Les Price, FLP, Hermosa, and keep him notified of all your ham activities. This will be the last station activities from RRN, and again I want to thank all of you who have helped in the past several years. See you in Yankton in September. Traffic: (June) W0GDE 59, SMV 53, SCT 38, PHR 17, RSP 12, BQH 9. (May) W0WBW 6.

**MINNESOTA** — SCM, Charles M. Bove, W0MXC — Asst. SCMs: Vince Smythe, 0GQG, SEC: GTX. RMs: DQL and KLG. PAMs: JIE and UCV. Don't forget Sept. 9th to Sept. 11th, the dates of the Second Annual 10,000 Lakes QSO Party. Sponsored by the Minneapolis and St. Paul Radio Clubs to enable Minnesota hams to get better acquainted with each other, the party is open to all amateur radio operators to encourage everyone to make new friendships in Minnesota. Another gold cup was given to the most deserving amateur station in Minnesota. This cup is given annually by the Minneapolis Radio Club and is known as the Forrest Bryant W0FDS Award. The cup was awarded to AUI for his outstanding contribution to ham radio. As mentioned before, all amateurs in Minnesota are eligible to compete for this cup. All you have to do is write a letter to the secretary of the Minneapolis Radio Club giving the name of the ham you think is the most deserving and stating the outstanding contributions he or she has given to amateur radio. HFY is on the air with a pair of 6146s and a new antenna. VBS worked 21 countries on 40-meter c.w. in 5 months. OGH is building a receiver and experimenting with remote controls using transistors. KXC is back from Nevada after working with the AEC. WZZ worked New York on his first contact after getting his license. Gordie Simon's code class has produced two more Novices, BHT and BFU. Four Novices who have just received their General Class licenses are VRK, WDW, WZZ, and AIK. AZC is a new Novice. SYD is mobile. TYX is teaching 7 students code and theory. SYD is operating a station for the Boy Scouts. URQ and KJZ attended the Dakota Division Convention in North Dakota and had a wonderful time. Traffic: W0KLG 281, HFY 189, RLQ 146, TUS 135, KJZ 106, WMA 83, LST 82, MBD 73, QDP 73, UNG 66, WVO 55, TKX 54, LUX 52, GTX 44, UCV 38, BUO 31, NJZ 27, RVO 26, VRK 24, GQQ 23, IRJ 23, NTV 21, FCU 15, RLI 14, VEP 13, AFP 11, ZBL 11, OJG 7, MXC 6, OPA 6, SYD 5, QVR 4, HPT 3.

### MINNESOTA (10,000 LAKES) QSO PARTY

Sept. 9 (1900 CST) to Sept. 11 (2400 CST)

Sponsored by the Minneapolis & St. Paul Radio Clubs to enable Minnesota hams to get better acquainted with each other. The party is open to all amateur radio operators to encourage everyone to make new friendships in Minnesota. Rules: (1) Exchange signal report, city and state. (2) Any and all bands and any type of emission may be used. We suggest 3820 and 7220 kc. for 'phone, 3650 and 7050 kc. for c.w. (3) Scoring: (a) Minnesota stations, 10 points for each contact with another Minnesota station, 5 points for each contact outside Minnesota; multiply by the number of states, provinces and foreign countries worked. (b) Stations outside Minnesota, 50 points for each contact with a Minnesota station; multiply by the number of Minnesota cities or towns worked. (c) A station may be worked only once for scoring credit. (d) No time limits or power multipliers. (4) Awards: (a) Certificates to 3 highest Minnesota scorers, and for highest score from each state, province and foreign country. (b) Separate awards for Novices. (c) Separate awards for all V.H.F. scores. (5) Submit logs to: Contest, P. O. Box 512, St. Paul, Minn., before October 1, 1955. All entrants will receive complete results by direct mail.

## DELTA DIVISION

**ARKANSAS** — Owen G. Mahaffey, W5FMF — The OZK C.W. Net will take a vacation during the summer and will start again the first Monday in September with SXM in charge. Your SCM had the pleasure of attending the South East Arkansas Amateur Radio Club Hamfest in Pine (Continued on page 82)

If you operate 'phone YOU WON'T BE SATISFIED UNTIL YOU OWN



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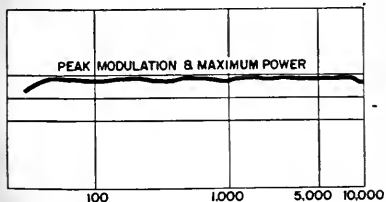
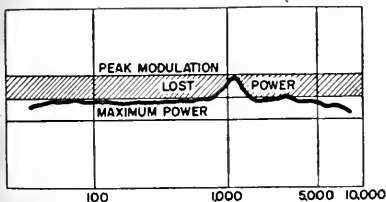
**The 664 will equal a useful power increase of four times over commonly-used peaked microphones, and could well be the best investment, dollar-wise, in your shack**

Here is a totally new concept in microphones for amateur phone communication.

The cardioid (high directivity at all frequencies) pickup pattern enables you to have a *real* "arm chair QSO." The forward gain of 5 db\*\* allows you to speak at nearly twice the distance you have been working to a conventional microphone. Unwanted sounds in the shack are rejected nearly twice as effectively as by ordinarily-used non-directional microphones.

The response curve is tailored to put the highest degree of intelligibility on your carrier. Your 100% modulation is all speech . . . in full character . . . with bite and punch. This curve, compared to ordinary microphones, will give you up to 12 db more usable audio—without splatter or hash.

We invite you to prove to yourself that the 664 will outperform your present mike by a direct comparison. If it doesn't out-hurdle QRM, your distributor will refund the purchase price without qualification.



A peak in the response curve limits modulation to the peak value. A peak-free response brings the full power level to 100% modulation gaining an intelligibility increase equal to the peak in the average mike. The 664 is peak-free and gives the highest usable power of any microphone for AM, NFM and SSB.

New Variable D\* Dynamic Microphone operates on the principle of multiple sound paths to the diaphragm. Spaced apertures to the rear of the diaphragm are phased to provide cancellation of rear sounds and give full response to sound from the front.

This new principle enables the curve to be free from peaks or dips. Insures freedom of blasting and boominess from close talking. Eliminates effect from mechanical shock. High level —55 db. Acoustalloy diaphragm. Switch easily changed to relay control, if desired. Absolutely unaffected by moisture, humidity, or temperature.

Model 664. Without Stand.....Net Price: \$47.70  
Model 419. Desk Stand.....Net: 9.00

\*\*Forward gain is that compared to a pressure mike; actual front-to-back hemisphere pick-up ratio is 20 db.

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Bluff. There were about 125 present and several nice prizes were awarded. There was some good entertainment, plenty to eat and everyone had a good time. Several official appointments were made. On returning home I met with the Fort Smith Amateur Radio Club in a pre-arranged special meeting where some urgently-needed appointments were made. As there will not be a Division Convention this year I would like to meet with other clubs in the State. Appointments made in June: HNU, PZB, and ANR as ECs; VTZ, JWL and EUQ as OOs; VAN, VYAL and EUQ as OBSs; HFE, VAN, WCM, NKH, VAA, DYS, UEC, VYM, and ZJI as OPSs. Traffic: W5CAF 82, JZL 2, PX 2.

**LOUISIANA** — SCM, Thomas J. Morzavi, W5FMO — Operation Alert 1955 brought out the SCM, SEC, 10 ECs, and 69 operators, mostly AREC members, in 7 major localities and a score of smaller communities, in support of the state civil defense operation. All in all, the final station tabulation looked like many of the Delta Net came in and took over for the 26 hours. IUG is to be commended for his efforts. Baton Rouge and Istrouma AREC met jointly in welcoming 1BDI on June 13th and the New Orleans group was host to Ed on June 17th. The topics were ARRL matters and amateur activities in general. DHV got his General Class license and is active on phone. DTM is a new ham in Lake Charles. Woose is in Lake Charles for the summer months. VRO, in Goose Bay, Labrador, is waiting for his Globe King to arrive to get on the air. ZAP has a B&W 5100 a.m. transmitter with a B&W 51SB si leband generator. He also is going mobile with a 75-meter rig in a '55 Pontiac convertible. After being off the air for a spell, GMR is back on 75 meters with a kw. VIC's harmonic now has his own call, KN5AUB. YSN meets BREN and the RN5 C.W. Net. The Greater New Orleans AREC is sponsoring another Labor Day "Week End in Old New Orleans. Write to Box 13003 and plan to attend this gala affair. K5FAA makes BPL again. Let's get some reports in. This column needs your help. Traffic: K5FFA 520, W5MXQ 152, EA 71, NAW 70, VIC 58, FMO 8.

**MISSISSIPPI** — SCM, Julian G. Blakely, W5WZY — Operation Alert was successful with 50 stations taking part. KYC was NCS, with ART as alternate. Operations were carried on continuously for 12 hours. Out-of-section outlets were obtained and the press wires were "scooped" on every important development. Stations making "OA" a success were KYC, ART, IHP/M, PFC, YFJ, BTM, CFL, VME, UTK, EWE, DAT, WZY, WZZ, NPO, GDW, FKS, ZZZ, KHB, LPG/M, IZS, VTL, VBO, CAC, TDO/M, UJK, UK, SQU, SFC, EGU, HCW, TVB, BJR, K5ANK, BYC, UTM, TAK, SRU, WMQ, TXK/4, ANK, BGU, BGC/5, TIE, AKM, PCD, 4GGG, 4MEP, and 4KWDU. During the above operation PFC and other Jackson stations participated in a city-wide alert called by the c.d. 10 meters was used. VQE was liaison for the two nets. Our Communications Manager, 1BDI, paid a visit to the Jackson Radio Club. Many members from out of town were present and the meeting was enjoyed by all. The section turned out for Field Day with 5 clubs beating the air waves. K5FGJ/5 was in there, all bands, 30 watts, and nine operators. SRG/5 had eight operators, RRE/5 nine operators, TFFV/5 five operators, and ZZZ/5 ten operators. Traffic: W5YFJ 105, JHS 58, EDE 21, BTM 20, DAT II, WZY 8.

**TENNESSEE** — SCM, Harry C. Simpson, W4SCF — SEC: RRV, PAM; PFP, RM; WQW. The C.W. Net will reopen as you read this, and RM WQW sincerely requests your presence on the C.W. Net for the fall rush. It meets 3635 kc. 1900 CST Mon. through Sat. Your PAM, PFP, also requests more attendance on the Tennessee Phone Net, Mon.-Sat. 0645 CST, 3950 kc., plus Tue. and Thurs. at 1800 CST and Sun. at 0800. The Memphis Hamfest was a grand success, with 250 hams from 13 states. Guests included Ed Handy, ARRL Communications Mgr., and Captain Don Ward, 3rd Army Chief of MARS. Field Day was a success in this section also, with your SCM receiving reports from twelve club stations. PL, still recuperating, thanks his many friends for their letters, calls, and best wishes. The Bays Mountain Club plans a Work-All-States Party for a week-end outing. BCA, HUT, and SCF visited the Clarksville gang. WQT received a PS award, also won that Club's SS award. AEE reports approved RACES plans now include Chattanooga-Hamilton County (July 5), Tennessee State, Dresden-Weakley County, Memphis-Shelby County, and Knoxville-Knox County. IIB reports 6 meters was used very successfully in the Chattanooga Area during the recent c.d. alert. FLW reports a good workout for Weakley County in the same test, as did BAQ from the Memphis Area. UWA, in Kentucky for the summer, sends regards to his Tennessee friends. Traffic: (June) W4OGG 501, PGP 186, IIB 109, HHH 93, TZZ 93, WQT 91, WQW 81, YMB 49, VJ 42, SCF 40, FLW 38, SJ 34, ZBQ 34, BAQ 26, UVP 17, UWA 15, CXY 12, AFD 10, HUT 9, K4BKC 8, WHHSX 6, BAO 4, DCII 4, FRB 4, STI 4, CLQ 3, KN4BNW 2, W4CLL 2, AEE 1. (May) W4TZZ 110, UVP 42.

## GREAT LAKES DIVISION

**KENTUCKY** — SCM, Robert E. Fields, W4SBI — SEC: CDA, RM: KKW. Acting PAM: NIZ. A large number of the Kentucky amateurs turned out for Field Day, the clubs turning in the highest scores and having the highest number of operators. Several Field Day messages were sent

to the SCM for a twenty-five (25) point credit. It sure is good to see so many working their gear with emergency power and operating conditions. Our next big day is the Lexington Hamfest Sept. 25th. CDA suggests that all Kentucky stations obtain copies of the ARRL Operating Manual and Emergency Communications Manual, free to ARRL members on request from either CDA or SBI. WNH is planning a 300-watt final for 2 meters. SBI now has an antenna up for 80 meters and hopes that it will work across the state line at least and also hopes to have a pair of 813s on before too long. JUI says he has a 13-year-old son interested in hamming who is up to 10 w.p.m. He also states that he is a real hard-boiled instructor. Traffic: W4KKW 182, QCD 165, ZDB 118, CDA 87, RPF 46, ZLK 40, ZDA 30, BZY 27, IISI 22, UWA/4 15, HJN 14, SBI 14, WMF 14, SDZ 10, SZB 9, KRC 8, IAY 6, CON 6, JUI 4.

**MICHIGAN** — SCM, Thomas G. Mitchell, W8RAE — Asst. SCMs: Joe Beljan, 88CW (c.w.); Bob Cooper, 8AQA (phone). SEC: GJH. Activities seem to have hit the summer slump after a successful Field Day. Conditions have taken a toll on the traffic nets and the hot weather seems to have driven most of us outside. Judging from the Field Day activity notices, there should be some new records this year. Despite the odds, many of the emergency nets seem to be functioning through the summer months as they well should. There is no new word from the SEC this month, but I am assured that he is continuing to work with the MIOC officials as mentioned in the last report. FGB reports that the call KQAA4 has been issued as a "Disaster Communications Service" for the St. Joseph-Benton Harbor Area and will be operated by Ground Observer Corps personnel. This station will use 1761.5 kc. (Ch. 9) and 1782.5 kc. (Ch. 12) for fixed and mobile work. This is the second such station authorization granted in Michigan. More details may be obtained from FGB. New officers ('55-'56) of the Catalpa Amateur Radio Society are: VVD, pres.; GBT, vice-pres.; UEO, rec. sec.; ELR, corr. sec. and treas. JKK says he needs some good dope on an 80-meter vertical antenna. Sounds like he is penned in. Anybody have any ideas for him? QIT sent some pictures of his neat basement shack and his magnesium three-element wide-spaced 20-meter rotator that weighs only 90 pounds. He should be ready for the DX openings that are starting. DUS is going after the DX business in an S-9 manner. He is charting the CRPL information about two months in advance and it is most interesting to note the accuracy of the predictions. His stacked 10-, 15-, and 20-meter beams above the 120 feet of tower will be there when the times are right. PRL is eager to become active again and solicits word from those having good equipment available for sale. Traffic: (June) W8NUL 221, JYJ 124, ILP 109, NOH 71, ZLK 50, DAP 40, RAE 40, NTC/8 34, FGB 33, IJ3 33, QIN 30, SCW 27, IV 22, SJF 21, WOX 15, HSG 13, HKT 11, COW 10, PDF 10, SRK 8, DSE 7, AUD 6, RVZ 6, PHM 5, INF 4, FSZ 3, WVL 2. (May) W8IV 31, OQH 20, SIB 2.

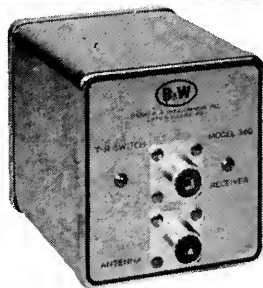
**OHIO** — SCM, John E. Slinger, W8AJW — Asst. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8JNF; and E. F. Bonnet, 80VG. SEC: UPB. RMs: DAE and FYO. PAMs: EQN and HUX. New appointees are MBE and PIJ as ECs; IZF as OES; and BOJ as OO Class IV. K8FCJ (4 operators) made BPL for May. We regret to report the death of DVP. GDQ reports excellent cooperation from Lorain Co. amateurs during the c.d. alert of June 15th. DCJ has procured a new Viking Ranger. The Springfield group has two club calls, NCM and TTE. VZE is trustee of the latter. SYZ worked all states as a Novice. MEI has become quite a 40-meter DX man, according to reports from the Dover Area. W2UKS/MM, aboard the SS *North America*, is operating all bands, both phone and c.w., during the summer Great Lakes cruise. The BSWRA, Akron, has scheduled its annual picnic for Aug. 28th at Happy 1.ays Camp. LVF is scheduled to do academic research work in Mexico City. The West Park Radios awarded loving cups to HFE, INW, AJW, and ZEU for their operating performances on Field Day. QCO has acquired a new harmonic. The Licking Co. amateurs held their Field Day at DSX's farm. The entire gang was practically rained out. HOS' seven-year-old daughter has received the call W8NBCU. Any younger amateurs in the section? The Cleveland Brasspounders had its generator go bad during Field Day after having made over 400 contacts with three transmitters during the first nine hours of operation. RBX reports the following from the Toledo Area: A proficiency award was given HNP for his help in setting up the RACES program in the Toledo Area; the Annual Radio Rifle Match, in which Detroit, Grand Rapids, Toledo, and Pittsburgh participated, was handled by PNY and YGR on 3610 kc.; the Toledo Club held Field Day beside a quarry so that members could fish or swim when the bands cooled off; BIQ is up to 93 countries on 21-Mc. phone; and the Bi-Annual QSO Party, a local affair, has been named "The Maynard A. Nelson QSO Party" in memory of HHF, who recently passed away. Cincy's *Mike and Key* reports that the GCARA'S Stag Hamfest will be another extravaganza. First prize will be a 75A-4 and second prize an Elmac AF-67. The Columbus *Carascope* informs us that PEN gave a talk on frequency measuring at the July 1st meeting; the CARA Picnic was held July 24th at Black Lick Woods;

(Continued on page 84)

# QUALITY PRODUCTS

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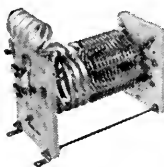
Three valuable instruments in one, the Matchmaster can be used as a dummy load, direct-reading r-f wattmeter, and an integral SWR bridge, for fast measurements on coaxial feed lines, antennas, and transmitting equipment.

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The 51SB generator offers sparkling SSB performance with your present B&W, Collins, or Johnson transmitter, on 80 through 10 meters with the output frequency control presently in your transmitter.

## 1 KW PI-NETWORK TANK COIL



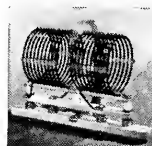
A high-power integral bandswitched pi-network tank coil for maximum efficiency from 80 through 10 meters. For Class "C" or linear operation. Minimum "Q" of 300 over entire operating range.

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FYW has constructed a two-over-10-over-20 stacked beam; WN8ABM, a YL, worked a KP4 on 15 meters; OMY has made WAS; and SJQ has received his General Class license. Northeastern Ohio's *Ham Flashes* states that BYT has installed an all-band transmitter in his car; HLX has erected a 60-foot steel mast for various antennas; MID received a scholarship to the King's Point Merchant Marine Academy; HRV and JIF are running a code and theory class in East Palestine with six licenses resulting to date; and TNL is operating a Globe King on 75 meters. It was necessary to cancel a number of appointments this month because of non-reporting on the part of the appointees. This is unfortunate but, on the other hand, only "live wire" appointees aid in keeping this section at its high activity level. Traffic: (June) K8FCJ 327, W8DAE 206, MVJ 90, AMH 171, HDA 116, AJW 109, PM 102, ARO 100, IIR 88, AJH 86, GDO 83, HFE 74, INW 72, HNP 52, RO 47, FJV 46, AL 39, JHH 30, MQQ 30, QXH 30, HPP 25, EQN 20, GZ 20, LHJ 18, ET 8, NPP 8, PMJ 8, QXQ 8, TLW 6, VTP 6, LGR 5, KXN 4, STR 4, URN 4, WON 4, WYL 4, DCJ 3, JDN 3, LMB 3, PFP 3, APC 2, AQ 2, AZR 2, JMD 2, RFX 2, VUS 2, BUM 1. (May) K8FCJ 759, W8IFX 88, MQQ 62.

## HUDSON DIVISION

**NEW YORK CITY AND LONG ISLAND** — SCM, Carleton L. Coleman, W2YBT — Asst. SCM: Harry J. Dannels, 2TUK. SEC: ADO. PAM: NJL. RMs: VNJ and LPJ. New appointment: K2ABW as ORS. At the time this column is being written, the section is in the midst of a hot spell of weather and the mobiles are out in full force. Incidentally, all mobiles are urged to sign up with their local EC for AREC work. Your assistance is needed and your mobiles can perform important work in time of emergency. VNJ announces that the NLI Net (3630 kc., 1930 EDT/EST) resumes full daily schedule on Sept. 5th. VNJ and OBU operated from the Statler Hotel handling traffic for the Walther League Convention. K2HYK's antennas are up an extra few feet to help his traffic count go higher, too. Many of our stations enjoyed vacation trips with ham radio gear accompanying them. JGV/1 made a good traffic score from W. Brookfield, Mass. KGN has 1/2 kw. on 20-meter c.w. IN has returned to the low-frequency bands but continues 144-Mc. activity. YSL has a new crystal converter for 144 Mc. K2EQH finds that his OBS skeds on 20 meters meet with the hearty approval of the local gang, who now hear ARRL bulletins regularly. K2AMM is happy to see increased 220-Mc. activity in Nassau County. K2OAZ is a new call at IJ. OBU is now heard on 'phone. All April CD Party N.Y.C.-L.I. 'phone entries, DLO, OBU, TUK, and EEN are Lake Success RC members. That should be a challenge to other clubs with appointment-holders. Let's have more section activity! PZE now is located in Smithtown. Field Day activity was at a peak this year with many N.Y.C.-L.I. club entries. The Eastern Suffolk RC, K2EC/2, with 18 operators, was located at Water Mill. DPQ/2, the Huntington RC, cooperated with disaster and canteen units of the Red Cross and operated from Huntington with 5 transmitters and 30 operators. YKQ/2, the Lake Success RC, had 20 operators and 5 transmitters at Bethpage. The Nassau RC, BVL/2, used its '54 site at Rockville Center. Several clubs moved outside the section: The Tuboro RC, LG/3, and the Order of Boiled Owls, MUM/3, traveled to the Eastern Pennsylvania section while the Brooklyn Poly RC, BXK/2, ventured to Asbury Park. K2CUI is on his annual trip to F- and HB9-Lands. During "Operation Alert," VNJ spent 36 hours at JVG control center. Officers of the Frog Hollow RC, K2QFQ, are AZA, pres.; KEB, secy.; FSM, treas.; and KDO, trustee. 4YFS/2 is on 75 meters from Bethpage. DLO built the W2HDZ filter for 50 Mc. from a QST article and it works fine on his TV set, enabling him to take part in recent 6-meter openings. K2LYD has a *Handbook* design 6146 rig. YHP completed a crystal converter for 144 Mc. K2CMV added four new countries to his log. EEN put up a new 14-Mc. ground plane. KN2JTW has 6BG6 rig and HQ-129X. K2DW has his WAC certificate endorsed for 3-way s.s.b. work. Please continue mailing all activity reports to TUK. Traffic: W2JOA 152, JGV 151, K2ABW 81, HYK 72, W2TUK 49, K2AMP 23, W2VLS 14, K2KXZ 11, W2EC 10, PF 9, OBU 8, K2CRH 6, W2EEY 5, IN 5, MDM 4.

**NORTHERN NEW JERSEY** — SCM, Lloyd H. Manamon, W2VQR — SEC: IIN. PAM: CCS. RMs: EAS, NKD, and CGG. The Irvington Radio Amateur Club has suspended activities for the summer season. CVW now is settled in his new QTH, and hopes to become more active again. DRV finds that time slips by very rapidly and sends in a five-month traffic report covering the period February to June. We will list the total of 62 in this part of the column to eliminate confusion. Thanks, Bob, even if it is late we appreciate it. KN2KHZ now is K2KIUZ, having passed the General Class exam on July 6th. Congrats, Dave. He was very active in DX work while a Novice, running up a total of which to be very proud. The 15-w.p.m. CP did the trick for Dave and helped him on to the new ticket. As a further reward the XYL has presented him with a new jr. operator, David Alan. K2HXP has a 6146 rig on the way. K2GLS participated in his first Field Day and was very

favorably impressed. EFJ won the Irvington RC hidden transmitter hunt. The "booby" prize went to WFK who, according to reports, had to be roped into the site. Many activity reports have been received on Field Day activities. K2GAS is in bad shape; he is on with the six-watt exciter fighting the QRM. K2GAN and K2BFE are organizing a civil defense communications net for New Providence. A remarkable Field Day job was done by VAV and HJD. They joined together as a team and with a 30-watt transmitter worked right on through the entire contest period. The heavy rains slowed them down a bit, but never was the rig silent. A special Field Day QSL card is the reward for any station working them. In fact, the cards come in two designs and are sure FB. A great deal of credit goes to these two fellows who have the real old-fashioned Field Day spirit. K2BWQ has a new 75A-4. The KWSI has not been delivered as yet. K2EUN has left for Northern Texas. Drop a line to the local SCM (page 6 QST) for a transfer of your ORS appointment. Walt, K2AFQ is off the air because of receiver trouble. K2GRU received his Eagle Scout award. K2GBB, EKO, and CCI graduated from Teaneck H.S. in June. All plan to enter college in the fall. K2DOX is a graduate of Xavier. NIY attended the telephone company meeting in St. John, Canada, and met VE1HQ, also at the meeting. K2BAY has a new SX-96 but no transmitter; a bad combination for the nerves. K2DHE is toying with the idea of building a new s.s.b. rig. NIE is mobile every week end on the high seas. Traffic: W2EAS 180, K2GFX 52, BWQ 43, GAS 34, EUN 12, W2NIY 2.

## MIDWEST DIVISION

**IOWA** — SCM, Russell B. Marquis, W0BDR — As the new SCM I wish to extend the thanks of the Iowa gang to PP, the retiring SCM, for the faithful service he has rendered to the Iowa Section. Field Day entries: BXR, BBE, RMG, WML, YWW, ERG, QVN, MIEL, AGB, GTF, TUC, JUI, IUY, RWG, KRU, MLY, TMY, K0BPR, and ANO. QVA renewed ORS and RM appointments and was host to BLII, LJW, and CGY. BLH, the Tall Corn manager, visited several Tall Corn members on a swing around the State. SCA and UJC received Asst. SCM appointments. DDV was mobile while on vacation in Arizona. KGX and PIK are also were mobile on their vacations. BFW and PIK are sharing NCS duties during the summer for the Iowa YL Net. New stations are KN0BMB, KN0BMC, KN0BDO, and K0BLI. AEB has a new vertical for 80-meter s.s.b. UCE has the Ranger finished. QLU reports increasing activity on 50 Mc. with the Cedar Rapids Club using the band for intercom during Field Day. Nineteen attended the Tall Corn party in Cedar Rapids. The Charles City Club was host at the 160 'Phone Net picnic. SCA has a new Ranger VFO. The Central Iowa Radio Club held a picnic June 12th. The Fairfield High School Radio Club was organized Jan. 1st with 30 members. Officers of the Sioux City Radio Club are TLC, pres.; JKT, vice-pres.; UIJ, secy.; AQI, treas.; SQE, reporter; AZR, sgt. at arms. Traffic: (June) W0BDR 1073, PZO 902, SCA 901, CZ 261, LJW 77, QVA 74, EHH 26, BLH 22, UCE 22, LGG 21, OXY 10, PAN 9, PUR 5, FDM 4, NGS 3, PKT 3, UTD 2, JUI 1. (May) W0XNY 9.

**KANSAS** — SCM, Earl N. Johnston, W0ICV — SEC: PAH. PAM: FNS. RM: KXL/NIY. Ten Field Day groups reported their activities to the SCM this year. Field Day groups reporting were SeKan Radio Club, Ottawa Emergency Radio Club, WDAF-TV Radio Club, Central Kansas Amateur Radio Club, Eldorado Amateur Radio Club, Radio Club of Leavenworth Senior High School, Johnson County Radio Amateur Club, Hutchinson Amateur Radio Club, Kaw Valley Radio Club of Topeka, and GCH at Oakley. QGG is a new OBS operating on 3610 kc. at 1830 Mon., Wed., and Fri. FEO is attending ROTC Camp at Fort Carson, Colo., reporting on QKS from there on MARS station. EOT acquired an XYL June 26th. Hats off to one of the newest and most active radio clubs, the Wheat Belt Radio Club. It was organized about six months ago but already has 30 members, 70 per cent registered with AREC, conducted a very successful Field Day, has applied for ARRL affiliation, publishes a club *Newsgram*, and has gained very favorable publicity in several newspapers. UOL is president. The Eldorado Amateur Radio Club was given FTW's 300-watt rig for a club station and hopes to be assigned Jack's call in memoriam. The EARC held a family picnic for more than 36 hams and their families at Lake Eldorado June 5th. Traffic: (June) W0IFR 408, BLI 336, CET 299, NIY 201, DEL 137, OIH 135, MNG 92, SVE 71, FDJ 48, EOT 34, FNS 32, SAF 23, TNA 23, YFE 16, LQN 11, YVM 10, FHT 8, WWR 7, UAT 5, QGG 4, RXM 4, ICV/MJ 3, LBJ 2, YJU 2, W0YVY 2, W0YVY 1. (May) W0LBJ 35, NFX 19, KN0AUIW 7.

**MISSOURI** — SCM, James W. Hoover, W0GEP — SEC: YRF. PAM: BVL. RMs: OUD and QNO. Ordinary activities were curtailed somewhat in June while preparing for Operation Alert and Field Day. CPI reports static is making traffic-handling difficult on 75 meters. GBJ reported a wet Field Day in Springfield. OMM visited ORF. This year is the 30th anniversary of EBE. EZMI visited QMF. PWN is now equipped for VFO, multi-band operation. WAP reported an enjoyable dinner and ragchew attended

(Continued on page 86)





## A PAIR OF EIMAC 4X250B's— the easy, modern approach to a compact one-kilowatt CW and SSB rig

You'd be amazed how easy it is to build a one-kilowatt rig using Eimac 4X250B radial-beam power tetrodes. Each of these bantam tubes handles 500 watts input with only 2000 volts on the plate. A pair in the final amplifier provides a kilowatt with the power supply and transmitter combined taking only a fraction of the space required for an old-fashioned kilowatt rack.

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The versatile 4X250B can supplant the famous 4X150A, and it offers the advantages of easier cooling and higher power. No forced-air cooling is required during stand-by periods if convection air is provided properly.

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### TYPICAL OPERATION

#### 4X250B Radial-Beam Power Tetrode (Frequencies to 175mc per tube)

	Class-C CW or FM Phone	Class AB <sub>1</sub> RF Linear
D-C Plate Voltage	2000v	2000v
D-C Screen Voltage	250v	350v
D-C Grid Voltage	— 90v	— 50v
D-C Plate Current	250ma	250ma*
Zero Sig D-C Plate Current	— —	100ma
D-C Screen Current	25ma	15ma*
Peak RF Grid Voltage	115v	50v*
Driving Power	2.8w	0w
Plate Power Input	500w	500w*
Plate Power Output	410w	325w*

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An Eimac air system socket with built-in screen by-pass condenser provides optimum amplifier circuit stability and cooling arrangements for the 4X250B.

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by 17 hams in Grandview, June 23rd. His work has kept him from traffic. ETW graduated from St. Louis U. with a B.S. degree in physics. CKQ has qualified for a 2500 Trafficer certificate. RTW received an ORS appointment. SAK has applied for an OO appointment. Field Day operation reports were received from DZT, Springfield; SXY, Sedalia; VTF, Fayette; FLN, St. Louis; RFU, St. Louis; and K0ACK. The Suburban Radio Club installed antennas at its new QTH in time for Operation Alert. A combined net roster for MON and SMN has been published by SAK and VTF in *MO* News. Advances from Novice to General Class were made by TDT and ZWP. WN0WEQ received his Technician Class license. GEP visited the Northwest St. Louis Radio Club to discuss AREC plans and activities. BZK is working in Chicago during his summer vacation from school. 2- and 6-meter activity is picking up in the St. Louis Area. Traffic: (June) W0CP1 1182, GAR 518, GBJ 148, VTF 129, OMM 104, SAK 90, RTW 79, OUD 71, CKQ 44, BVL 42, HIR 38, HUI 31, VPQ 26, KIK 17, ECE 13, MFB 10, BUL 7, EBE 5, KA 4, QMF 4, TCF 4, GEP 3, MRQ 3. (May) K0FCT 247, W0HU1 26, RCV 14, QMF 8, VFP 3, ETW 1.

**NEBRASKA** — SCM, Floyd B. Campbell, W0CBH. Asst. SCM: Tom Boydston, 0VXY. SEC: JDJ. From the radiograms received at this office, there was a lot of activity on Field Day. FQB really has been organizing the c.d. system around Omaha. HMN has a new home-brewed 6-meter rig. RHL and his XYL spent 2 weeks touring California before leaving for duty in Okinawa. QKR really was busy during the recent storm at Gering and Scottsbluff. The new mobile (QKR) is fashioned after the Mighty Mo out of a recent QST. UOB is a full member of the Soo Radio Club, along with being chairman of the SRC and a member of the Sidney Area TVI Committee. AFG and DQN also are members of the SRC. We are sorry to report that GDZ has been transferred to W3-Land. Tiny did a very nice job as EC of Western Nebraska. JDJ spent a month in California recently. VNI is the new call of the Norfolk Radio Club. The UP Radio Club meets every other Wed. on 3940 kc. at 8 p.m. This is not restricted to employees of UP but is open to everybody. North Platte can boast of having 20 employees eligible for the club. Thanks to the many s.s.b. and a.m. stations for clearing the frequency during a tornado in Western Nebraska. VQR was on at Scottsbluff with loads of traffic and personally recognizes the following for their assistance: EMY, TIP, AFS, DPT, ERM, KLB, K0WBF, UFZ, LEF, EUT, BLM, and PUT. Traffic: (June) W0PMV 89, DDT 78, ZJF 66, HTA 48, K0WBF 40, W0VYX 22, AEM 16, POP 14, CTH 11, AGP 8, EGQ 8, FR8 8, KVM 8, ORW 8, TIP 8, VGH 7, HQN 6, OCU 5, KDW 4, KLB 4, PON 4, LEF 3, LZL 3, QVY 3, K0BDF 2, W0CBH 2, DPU 2, GTW 2, NBS 2, RAMO 2, SZL 2. (May) W0KDW 12, FQB 6. (Apr.) W0KDW 39.

## NEW ENGLAND DIVISION

**CONNECTICUT** — SCM, Milton E. Chaffee, W1EFW — SEC: LKF. PAM: LWW. RM: KYQ. MCN and CN 3640 (0645 and 1845), CPN 3880 (1830), CTN 3640 (Sun. 0900), CEN 29,580 kc. Traffic on CN reached 200, averaging 8.3 messages and 9.1 stations per session. MCN handled 108 with 4.8 and 6.4 as the same type averages. RGB, KYQ, and LIG rated QNI honors on CN while RGB, IBE, and RFJ led on MCN. Operation Alert apparently went off well. Bristol C.D. was manned by CKA, CLD, and RLN. Southington C.D. operation included ZZK, EFW, and Novice EQL. TJV Area 4 was operated by RGB, STT, WHR, ZKE, AKV, and PIP. PHP reports activity by IJD, JWW, YFG, ZJY, JYI, RRE, QMB, EBO, UQV, and MHF in their respective towns, and they handled 106 messages on 2 and 10 meters. CKA is on with a new Globe Champion. New Novices in Southington are GAV and GFL. OO reports were received from BVB and RFC. ZJY and ZJZ are operating portable for the summer at Lenox, Mass. EZY, age 13, is a new New Haven Novice. RMW has resigned as EC of Norwalk to give somebody else a chance. FB bulletins were received from the Middlesex and Manchester Clubs. FYM is a new Middletown Novice. New Middlesex Club officers are EGX, pres.; EWD, vice-pres.; ZIII, secy.; and ZBL, treas. New ECs are QMB and KJT. Renewals include UTZ, UJG, RFJ, and BDI as OFS; PHP as EC; and ORP and BDI as ORS. Have you checked your expiration date lately? UIZ reports operation at Mt. Equinox, Vt., in the V.H.F. Contest on 50, 144, 220, 432, and 3300 Mc., DX on the latter being 100 yards. Manchester claims 46 hams — one for each 800 population. Can any town top that? Connecticut Field Day scores should be good as many signals were heard on all bands. Eleven messages were received by the SCM. BDI/I made 396 points with car mobile on 80- and 10-meter c.w. YYM/WPO have left the hills for a new QTH in Windsor Locks. ORP reports an expected break in his sked with 3FQB, which has been going nearly 9 years. EOB has been transferred back to Chicopee, Mass. YLII recently was elected to Eta Kappa Nu, honorary E.E. fraternity at Rensselaer. Traffic: WYBII 209, CTH 163, RGB 144, AW 84, TYQ 73, EFW 72, LIG 70, KYQ 68, NJM 68, UED 59, BDI 32, ZDX 28, KV 23, YNC 17, LV 13, HYF 6, ORP 1.

**MAINE** — SCM, Allan D. Duntley, W1BPI/YVA — We regret losing WRZ as PAM because of poor health; but

are very glad to announce the appointment of TWR as PAM. You have a hard job, Wes, to fill Hap's shoes, but we know you can do it. Hats off to the Augusta gang for getting FRS/1, a station to be proud of. BYK and TVB did yeoman service during Operation Alert, as did many of the other boys in all counties. FD is back on the mountain helping to "Keep Maine Green" from his perch 3 flights up in the tower. It's a good spot to work 2 meters and Oscar says all you guys and gals are always welcome. The PAWA is quite busy issuing WAM certificates. Keep them coming in, boys. The QEEs are waiting for a bundle from heaven. The strange sound heard on "Heartbreak Ridge" are attributed to LQ modulating WRZ's rig. Jet also called on quite a few of the Augusta boys as well as your SCM. ZAG has a new mobile rig. The ZALs are now three. Congratulations on the new harmonic! EOP finally has cut some holes in his new Chrysler and is back mobile. Also KDE "operated" on his new Buick and is now putting out his usual lusty signal. WXI has joined the Vikings — husky boys, the "Norwegians." MFC now twists the knobs and dials at WTWO/TV in Bangor. Traffic: WILKP 85, WTC 83, EFR 46, YVW 44, UDD 36, BBS 35, TWR 26, BX 20, LYR 19, BAD 16, QUA 14, ZMK 12, TGW 8, YVN 7, BDP 4, WHV 4, DMV 2.

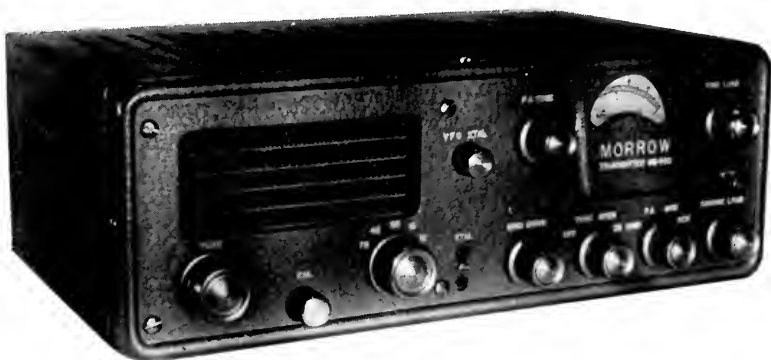
**EASTERN MASSACHUSETTS** — SCM, Frank L. Baker, jr., W1ALP — New appointments: SRG as OBS; ZWQ and WFQ, Alternate Radio Officers for Sector 1-B, as ECs. Appointments endorsed: DW Westwood, OTK Somerville, MKW Dennis, PST Brookline, as ECs; DWO and BY as ORS. QLT has applied for OO appointment; RQZ as EC for Abington and also as OBS. The South Shore Club held its annual banquet and installation of officers. Most of the clubs in this section were out on Field Day. As SCM some Field Day messages were received direct from IA/1, where I was doing some operating; others came by mail. UDC is the new c.d. director for Dedham. Sorry to have to announce the death of QIT, a cousin of SMV. Heard on 2 meters: TBX, LYL, QXX, ZGO, APV, FFR, FDB, BYI, mobile ZYO, WBR, PSG, and SIV. UFJ is on 75 meters. There was a lot of activity during the V.H.F. SS. RP is back on 75 meters and is going after WAS. PNH took part in the May F.M.T. Most of the c.d. groups were on during the nationwide c.d. test. IA, in Quincy, as head of Sector 1-B, was on for the full 24-hour period, with DXQ and ZIII staying all night. Others on were ALP, WFQ, ZWQ, VTT, CRO, VJC, and YJG. In the various towns these operators were among those active: MME, DUO, SMV, SH, WUW, VPR, AYG, ISU, FWS, WSN, WZN, CLF, MGL, GKN, QVN, HSN, IPE, YFA, OLP, QON, DW, KWD, ZYO, and LOS. UNA, an instructor at the Swampscott High School, reports a radio club where code and theory was given and the following new Novices: EVJ, EUU, ETW, EUT, EUY, and ETL. Other members are ZHG, ZBH, and BYB. OGG was the examiner. AVY has been ill. THO says he has a patent on a one-element 6-meter beam. The Framingham c.d. group has a 6-meter Gonsset which was operated by ZOP, QVK, and MEG during Operation Alert. More units will be on 146,850 kc. The Braintree Radio Club held a meeting. BY is busy at work. SXD is going to DL1-Land. LMU visited ex-8GP in Ohio. PIW plans a vertical for 10 meters. QMU is b.ilding power supplies. TTY has a Heath DX-100. HOL is on 6 meters. RM has two new cars. CLF says he is handling a lot of new traffic from Maine. The Hingham Club was out on Field Day with ADT, BIY, DMS, VAI, YOR, MD, AYG, 5HNW, and 4VXD operating. EPE operated 20-meter c.w. on Field Day with the Old Colony Club. QLT says Field Day was the biggest event of the month for the Falmouth Amateur Club. UKO has a new SX-96 receiver. FZU is Radio Officer for Middleboro, and FEC is on the planning board for South Massachusetts. ECK is new in Bridgewater on 10 meters. WN1DXN, new in E. Bridgewater, is on 80-meter c.w. VIII is summering at Hull. The Bedford Radio Club held its Annual Banquet and Ladies' Night. The Winthrop C.D. net had 19 stations on: UOC, CMW, TEO, KWD, NMX, TTH, BDU, DEL, DJ, OIR, DLY, DRP, DUV, HJF, MQB, BB, and DQF. WNIGBI is new in town. TQN graduated from West Point and is home for awhile. A new ham in Wellfleet is WN1FQQ. MPT went to New Jersey on vacation. OSX is home again. TQK had some bad steam burns. RDV and his XYL visited KPN and WNT. Traffic: (June) W1EPE 146, UKO 141, CLF 89, UE 42, AVY 35, TY 22, EMG 21, LM 18, NUP 14, WU 10, BY 7, QLT 6, ZDQ 4, ATX 3. (May) W1AB1, 1. (Apr.) W1AYG 2.

**WESTERN MASSACHUSETTS** — SCM, Osborne R. McKeraghan, W1HRV — SEC: RRX. RM: BVR. PAM: QWJ. The WMI C.W. Net meets on 3550 kc. Mon. through Sat. at 1900 EDT. The WMI Phone Net meets on 3870 kc. Wed. at 1800 EDT. SRM BVR reports the C.W. Net is doing fine in spite of hot weather. A new OPS is DPY. Lenox, Section net certificates went to SRM and ZUU. The Central Mass. Amateur Radio Assn. held its 7th Annual Gabfest. It was a huge success with more than 100 at the banquet. Speakers included UED from Headquarters, Fr. Fitzgerald of Holy Cross College, FCC examiner DLT, and your SCM. Holy Cross College in Worcester has an active radio club with the station call UYY and a membership of about 15. Four are General Class licensees with the rest

(Continued on page 88)

# Announcing: The New MORROW MB-560 Transmitter

90 Watt C. W., 60 Watt Phone All Band Companion  
to the MORROW MBR-5 Receiver



MORROW Company engineers take great pride in announcing the new MB-560 Transmitter, their latest addition to the MORROW family of fine amateur equipment. The MB-560 has been painstakingly designed to afford the amateurs a new high in efficiency, versatility and operating convenience in a compact transmitter for fixed or mobile service. Full 90 watt input on C.W. and 60 watts on phone for five amateur bands. Compare the features of this new, easy-to-use, easy-to-install transmitter for mobile and home operation . . . then SWITCH TO MORROW TODAY!

**1. VFO or XTAL** — Extremely stable VFO directly calibrated for 80, 40, 20, 15 and 10 meter bands. Xtal socket and OSC calibrate control on front panel.

**2. ZERO-BEAT CONTROL** — Allows operator to accurately zero-in on incoming signals without turning final amplifier on.

**3. 6146 POWER AMPLIFIER** — Efficient circuit delivers maximum power to antenna. Special two-section tuning capacitor allows band-spreading on 20, 15, and 10 meters.

**4. PI-NETWORK OUTPUT** — Circuit allows matching to wide range of antenna impedance for fixed, portable or mobile operation.

**5. NEGATIVE CLIPPER** — Push-pull Class "AB1" modulators with negative speech clipping for 100% high level modulation.

**6. BUILT-IN RELAYS** — Relays for controlling antenna and receiver silencing are built-in in the MB-560 Transmitter.

**7. FULLY METERED** — All necessary circuits are metered by front panel meter and selector switch.

**8. TUBE LINEUP** — 6146 PA 6AQ5 frequency multiplier, 6CL6 VFO and Xtal OSC, 2 6CU6 modulators, 12AX7 driver, 6AU6 pre-amplifier, 2 OB2 VR's.

**9. POWER REQUIREMENTS** — Operates on 6 or 12 volts. Requires 300-600 volts at 200 ma. and 250 volts at 75 ma. Latter voltage normally supplied by companion MBR-5 Receiver.

**10. SMALL AND SOLID** — Sturdily constructed of heavy aluminum for years of reliable service. Compact: 4" high x 11 $\frac{3}{4}$ " long x 6 $\frac{1}{2}$ " deep.

**11. POWER SUPPLIES** — PWR 6-12 DC exciter power supply \$29.95.

PWR 115X AC power supply for fixed operation for MBR-5 Receiver and MB-560 Transmitter \$29.50.

AC power pack for Receiver and Transmitter complete, available on request.

Interconnecting harness for using the MB-560 Transmitter and MBR-5 Receiver available as an accessory.

**12. AMATEUR NET** — \$189.50 complete with tubes, key and microphone plugs, power cable connectors, and MORROW-MOUNT quick mounting brackets.



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# NEW for VHF



Operate any frequency in the two meter band! Replace those 8 mc crystals with this compact, easy-to-assemble VFO kit

## JOHNSON TWO METER VFO

Temperature compensated and extremely stable, this compact Two Meter VFO kit is designed to replace 8 mc crystals in most existing two meter transmitters, including types using overtone oscillators. The easy-to-read, edge-lighted lucite dial is calibrated from 144 to 148 mc with 7 to 1 vernier tuning provided . . . output frequency range is 7.995 mc to 8.235 mc and a separate 7.995 to 8.235 mc dial calibration is provided to facilitate calibrating the unit with 8 mc crystals. Power requirements are only 6.3 volts at .3 amp and 250 to 325 volts at 10 ma and may be taken from the transmitter with which the VFO is used. (Power cable and octal power plug are furnished with the unit.) Tube line-up: 6BH6 series tuned oscillator and an OA2 voltage regulator. Dimensions, only 4" x 4½" x 5".

Cat. No. 240-132 Viking Two Meter VFO Kit including complete assembly instructions, tubes and pre-calibrated dial

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Novices and Novice trainees. Several rigs include a Navy TBM-10 and a Novice rig. The Club QNIs and has NCS jobs in the Deep Sea Drag Net and TCPN and has piled up 55 countries and WAC on 14 Mc. The Pittsfield Radio Club was very active Field Day with 5 rigs on emergency power, 20 operators, and used 5 bands. HCRA had 5 rigs and seven operators going strong at the same time. Others reporting Field Day activity were UIS, TPH, UUJ, IJL, UEY, and AZW. The Berkshire County Amateur Radio Assn. recently was formed with its first scheduled meeting for September. AZW finally hooked a KA with 25 watts on 14 Mc. UXK, reporting from Formosa, says he will be leaving soon for WI-Land and expects to be operating from his home QTH in Leominster by October. He built a VFO during his spare time and will put it in use when he gets home. TVJ has passed the 1st-class commercial phone exam and has a summer job in a radio station. BYH reports 53 countries worked and he has a new VFO. Traffic: (June) W1BVR 82, TAY 36, ABD 34, HRV 30, WDW 9, BYH 7, WPW 4, DPY 3, TVJ 3, (May) WITVJ 13, AMI 10, WPW 2.

**NEW HAMPSHIRE** — SCM, Harold J. Preble, W1HS — SEC: BXU. RMs: CRW and COC. PAM: CDX. Field Day equipment is packed away for another year. A good time was had by all, as always. The Concord Brasspounders had nine set-ups on Oak Hill and reports more contacts than any previous year. Ask them about the incentive. PFA is building a new QTH at Salem, N. H., and hopes to be in it soon. His tower already is up and has beams for 20, 10, and 2 meters and a ground plane for 6 meters. Looks like an FB set-up. CDX made BPL the hard way in June. NIDYE has passed his General Class examination. ARR received a new mill for a graduation present and is keeping it hot handling traffic. ZIW is knocking off lots of DX on 10 meters. AJF operates from UUY, Holy Cross University, during the school year. GMH reports recent visits from WTG and WTH with families, also SEO and his XYL. RCEN is closed down for the months of July and August. Greetings to Novices N1EMI, N1EMV, N1EMW, N1EMX, N1END, N1ENL, N1ENM, N1ENO, N1ENP, N1ENR, N1EOW, N1EQN, N1FCU, N1FDC, and N1GHW. Traffic: W1ARR 342, CRW 337, CDX 111, IP 74, ZIW 36, SAL 33, COC 30, WNIDYE 23, WICCE 18, HOU 14, GMH 13.

**VERMONT** — SCM, Robert L. Scott, W1RNA — Many of the gang are wondering what happened to the license plate bill. It was "harpooned." Thanks to all the fellows who worked for it and especially to BRG. The issue is not dead as far as we are concerned and next year will bring new endeavors to obtain the plates. The secretary of the BARC reports the following: More than 300 attended the 4th International Field Day and Vermont Hamfest, co-sponsored by the Montreal Amateur Radio Club of Montreal. Hams were present from New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, Vermont, and the Provinces of Quebec, Ontario, and British Columbia. TLI/M was winner of the 10-meter treasure hunt. Speakers were VE2BE, VE2TA, W1UED from ARRL, W1VEB, and W1RNA. A radiogram from the Vermont Green Mountain Net was handled via 80 and 10 meters to President Eisenhower at the Rutland Fair. A very fine letter was received in reply from Press Secretary Haggerty. Traffic: W1AVP 106, OAK 99, CMY 61, BJP 15, KJG 12, RNA 10.

### NORTHWESTERN DIVISION

**ALASKA** — SCM, Dave A. Fulton, K1TAGU — The C.D. Test of June 15th went very well in the Anchorage Area with a good turnout of mobiles as well as a crew at the c.d. headquarters, which handled the situation very well as far as communications were concerned. The mobiles in the Anchorage Area were called upon a second time this month for aid in the Lions Club operation "Little Red Wagon" Telethon. There was a good turnout of mobiles on this operation also, even though it came on the same week end as Field Day. There seems to be quite a bit of interest in the Alaskan DX certificate. Maybe it's a little harder to get than we thought. No. 1 has not been given out as yet, but we do know of one station just waiting for the confirmations to roll in. There were some 15-meter openings to the States from the Anchorage Area in both June and July. How about some news from the rest of the territory?

**IDAHO** — SCM, Alan K. Ross, W1WU — Rupert: CAP operated as portable in the Washington, D. C. Area in June. Gifford: VWS has a 25-w.p.m. Code Proficiency certificate. He needs Delaware, Rhode Island, Vermont, and Maine for WAS and would like schedules. Kellogg: RQG and WHZ had an FB Field Day making 21 contacts with emergency power. Emmett: HOV is the new EC for Emmett and Gem County and reports he has a 75-watt portable and three gas-driven generators available. Boise: 6EBK visited the gang at a "hamburger fry" while passing through. Some of the fellows are acquiring Motorola type 30D f.m. rigs for 2-meter mobile. The Gem State Amateur Radio Club worked a station at two hobby shows in June.

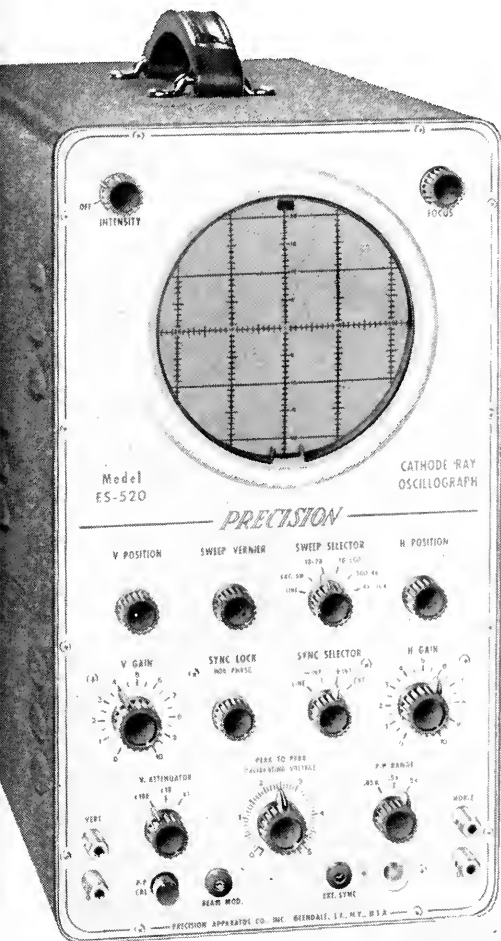
**MONTANA** — SCM, Leslie E. Crouter, W7CT — The Old Faithful Radio Club had a very successful ladies' night with 24 hams and their families attending. Two new hams in the club are WN7ZSR and WN7ZSS. Rigs were set up by FGB for Field Day for the Livingston gang and VMI of-

(Continued on page 90)

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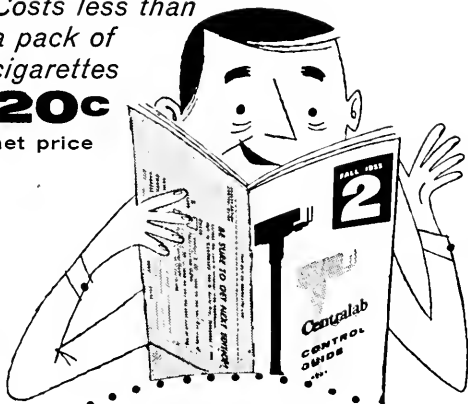
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fered his ranch as the location for the event. Plans are being made for a picnic with the Gallatin Radio Club for some time in September. FGB and RZY are busy working on plans for simulated emergencies for the coming season. GEF has returned from vacation in W0-Land. YPN is busy converting a pair of BC-375s. WBC is working on modulation equipment so that he can reap full enjoyment of his new General Class ticket. The second Eastern Montana Ham Picnic was held at Wolf Point on June 19th attended by over a hundred, of which 44 were hams. There were 17 mobiles and 1 aero mobile. Thanks to TPE for the report on the picnic. RZY recently moved to Butte and is active on 75 meters. A new ham in Butte is WN7YKN. CDW has a new kw. on 20 and 40 meters. The Butte Club still has copper certificates for those who can show proof of having worked at least six Butte stations. Traffic: (June) W7MQI 28, RYZ 4, (May) W7SFK 25.

**OREGON** — SCM, Edward F. Conyngham, W7ESJ — OO's report many second-harmonic signals outside the 40- and 20-meter bands, but band-edge operation was good. Field Day reports were received from LNG, Camp White on Rouge River; ANG, Cline Falls; SAA, Marys Peak; YYE, Benson Lookout; OTV, Mt. Buxton; KYC, Government Camp; ACY, Manzanita; SBT, Agate Desert; and RKP, Dodge Hill. This was an excellent turnout for Oregon. WAT will be QRL with school and work daytime and evenings but on Sundays will be on 40 meters. WHE moved to a new QTH and is rebuilding. AJN has trouble and is rebuilding. WLL ditto. APF believes the new final will solve the TVI difficulty. UJL is off on a camping trip. NFZ ran a test from City Park, Grants Pass, with mobiles in Medford and Ashland. UZU is building a new antenna system. LI and SEZ are starting up 2-meter MARS. VBF slowed down because of summer work. PRA is QRL OSN and RN7 but is building 2-meter equipment. PQJ is going strong with RTTY. SAR is wiring up a new Heathkit DX-100. RER has the kinks out of the new mobile. OJA, VIL, BEG, ISP, DIE, EZR, EXF, LNG, VPH, and ULR have a hot AREC and MARS project going on 10 meters. JRU, ABW, VDG, SBX, SBU, and UHC have the same thing going on 160 meters. Traffic: W7APF 92, PRA 78, WAT 50, THX 30, BLN 20, ESJ 12, UJL 9, LT 7.

**WASHINGTON** — SCM, Victor S. Gish, W7FIX — Nets: WARTS, 3970 kc., 1800 PST Mon. through Sat.; WSN, 3575 kc., 1900 PST Mon. through Fri. JPH is at school in Minneapolis. VAZ is using a Viking but building an 813 rig for traffic. FRU had antenna trouble but is back on the nets again. K7WAT reports the Fort Lewis Amateur Radio Club has been formed with KUS as its first president. RCM, your SEC, is doing a swell job despite illness in the family. APS is doing most of his trafficking on RN7. UIN is a new OPS in Tacoma. WQD is a new OBS in Port Angeles with nightly skeds on 3940 kc. at 1930 PST. EVW and APS renewed appointments as OPS and ORS. LVB now is on the air with 210 watts. AIB and CWN were on Field Day with the West Seattle gang. PQT is busy on MARS and WSN. UYL changed her QTH but is back on the air again. EHH took his 100-watt portable on a vacation trip to New Jersey. HDT, YBV, and WN6KDJ/7 worked Field Day in the rain. FZB was on Field Day from Bainbridge Island. BMK is reinstalling mobile. AVM has a 2-meter beam up but still is having trouble hearing others. UQY reports the Richland gang is on summer routine. YJE contacted seven sections on 6 meters in the V.H.F. Contest. The Seattle Wireless Association now is ARRL-affiliated. PVZ is keeping regular skeds over the Cascades from Olympia to Yakima and Toppish on 144 Mc. The Puyallup Club (IYU) reports: TGO was on the TV program "You Asked for It"; OEB still is expanding the house; on Field Day EHH, IYU, and MTX were on 75-meter; phone; HMQ and XYL, WHV, on 2 meters; MPH mobile Lake Washington; VLC and RMI are antenna experts. BA spent two weeks in W6-Land and visited W6NCP. He now is contemplating overhaul of the beam for better signals. Traffic: W7PGY 1106, BA 1102, VAZ 715, FRU 170, K7WAT 149, K6BDF/7 87, W7RCM 64, USO 50, APS 40, RXH 33, UIN 29, LVB 28, AIB 25, TGO 20, PQT 15, UYL 13, EHH 7, HDT 6, WQD 6, EVW 5, FZB 5, AVM 2, BMK 2, CWN 2.

## PACIFIC DIVISION

**NEVADA** — SCM, Ray T. Warner, W7JU — SEC: WVQ. ECs: PEW, PRM, TVF, TJJ, and ZT. OPSs: JUO and UPS. ORSs: MVP, PEW, and VIU. OBS: BVZ. Nevada State frequencies: Phone 3880 and 7268 kc.; c.w. 3660 and 7110 kc. YKC, of Las Vegas, is enjoying his new DX-100. 6ABN, operating portable in Las Vegas, hit an FB opening on 6 meters July 3rd, giving many stations in the southwest their first Nevada on this band. JUO completed his all-band mobile in time for a Colorado vacation jaunt. KIO now is active with a Viking II. 6JYN received an endorsed certificate for 50 Nevada QSOs. THH and VIQ received certificates for 25 Nevada QSLs. The Mobiliers, operating YN, were active on 2, 20, 40, and 80 meters at the Reno Hobby Show. The Southern Nevada Amateur Radio Club had a station operating from Helldorado Village during the recent celebration there. QGE, of Reno, now

(Continued on page 92)

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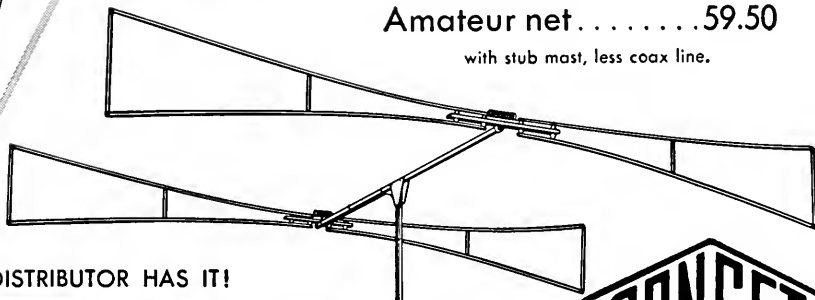
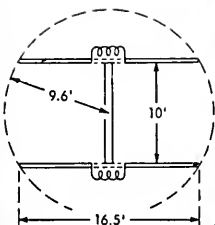
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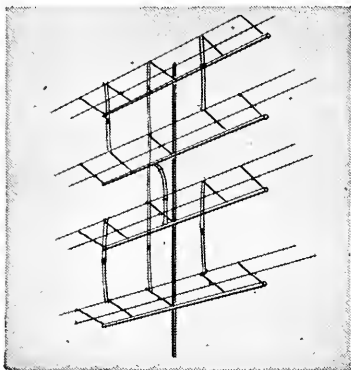


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is driving his 610 with a Ranger, ZT, RSY, and JU took in the Pacific Division Convention in Fresno.

**SANTA CLARA VALLEY** — SCM, R. Paul Tibbs, W6WGO — SEC: NVO. Asst. SCM: Roy E. Pinkham, 6BPT. K6BBD reports that a 33-ft. vertical antenna works very FB on 40 meters. Dick is looking for a Delaware contact for WAS. EXX's 50-Mc. rig is finished; now for the antenna. He worked 40 meters on Field Day for the PAARA and at Region Three headquarters during Operation Alert. WLI worked Field Day at AEX/6 near Saratoga. ZRJ rebuilt his receiver and made changes in his antenna as per George Grammer's dope passed to Doc at the Fresno Convention. K6GID is the new manager of NCN, replacing EFD, who resigned to take up schedules with Pacific stations for traffic work. GIL is planning on recruiting new stations for NCN. He would like all those stations in Northern California who can work c.w. on 3635 kc. to check into the net every night at 2000 hours PDST. Net sessions are not long and will not take much time from your activities. How about you boys who want to work with some real considerate operators? Speed is not fast. KN6JJG would like to start a net on 40 meters for Novice operators. Competition was very keen in the Section on Field Day. Most of the clubs had stations in the field and topnotch operators manning them. KIN has finished a three-element beam for 14 Mc. using inductive coupling. Al uses a Balun made from coax line to step up from 75-ohm line to 300 at the coupling rings. Traffic: (June) W6HC 145, ZRJ 144, FON 105, K6GID 88, W6AIT 39, K6BBD 29, KN6JJG 4, K6BAM 1. (May) K6GID 64, W6EXX 29.

**SAN FRANCISCO** — SCM, Walter A. Buckley, W6GGC — Asst. SCM: William T. Nakahara, 6GHL, KKM, secretary, reports new members of the Marin Amateur Radio Club are CXU, WNJ, K6KNX, W6WQI, and W7WND/6. LUM souped up his set and now has TVI. DXA is active on 2 meters. KKM operates 40-meter 'phone with 30 watts and received answers from K4s, KL7s, and KH6s. ZNT/6 now is at his new QTH in Mill Valley. TIJ recently retired after 40 years and he now expects to put lots of time into hamming. The Club will not hold any meetings until Sept. 9th. GQY will be QRL for a few months with the Youth Recreation Program. SLX reports that he is very busy helping some of the youths in Eureka to get their tickets. KN6HIW, KN6IKQ, and W6QMO attended the YLRL Convention. Jeri spent a week in Los Angeles visiting friends. WB was guest speaker for the San Francisco Club in June. He has monthly articles in Elmer's Tech News. The fellows enjoyed his talk on "New Ideas for Less Noise and Power Leaks in Receivers." KFS made his first out-of-state contact on 6 meters; he contacted FKY in Colorado. URA says openings on 6 meters have been very frequent lately. KFS and GGC were the hidden transmitter for the 29ers in June. K6ANP, who won the hunt, is now in Uncle Sam's Navy. The HAMS and the San Francisco Naval Shipyard joined ranks high on Mt. Davidson for Field Day. ARRL officials participating were NL, EC; UOQ, SEC: JWF, trustee of Red Cross communications; GGC, SCM. GHI did all the cooking for the boys and they were well fed. BIP and CTH were chairman and co-chairman for the San Francisco Radio Club. The Sonoma County Radio Club will hold its picnic at Sebastopol in September. Joan Neiman passed her Novice Class exam but has not yet received her call. GGV, of Stanford Research Lab., gave an interesting talk and demonstration on 2-meter c.d. and mobile transmitters to the boys at the San Francisco Naval Shipyard meeting. HJP was back in the San Francisco Area prior to departing for Okinawa with the U. S. Air Force. The bill for license plates for mobiles in California was OKed at this session of the legislature but at this writing has not been signed into law. GCV and PCN are settled in their new QTH. PHT did a grand job collecting prizes for the Mission Trail Roundup held at El Verano. All attending reported a wonderful week end. KZF has been reappointed as EC for MTN. LOU is now at his new QTH. OPL, as usual, came through with a large donation of hot dogs and salad for the Roundup. RBQ was not well enough to participate in Field Day but donated the use of two of his big trucks. Sorry to have to list as a Silent Key, K6ABE, who drowned in the Russian River June 18th. Traffic: W6GQY 131, GGC 64, PHT 55, GHI 12.

**SACRAMENTO VALLEY** — SCM, Harold L. Lucero, W6JDN — Field Day has come and gone and all clubs report a wonderful time. ASI just completed linear amplifier with 4-400As for his s.s.b. AK has gone s.s.b. with a 20A for an exciter and has a new 75-A4 and all the trimmings. ZF also has a 20A exciter for his s.s.b. GTG is active on 75 meters. DTW has a new Mini-beam for 20 meters. HSB and HTS are doing experimental work with antennas and are quite active on c.d. and 20-meter 'phone. GDO moved to Fair Oaks and is active on 75-meter mobile. GQS is active on 75-meter mobile and has a "Gallon" on 75 meters. MIW has a new Viking Ranger for all bands, but still is faithful to 144 Mc. PIW has gone completely 144 Mc. but says he still isn't convinced that 'phone is doing away with c.w. on the lower frequencies. VBQ moved to Stockton. HSV moved to North Sacramento. JIJ is active on 75-meter mobile. QDT reports in from the San Joaquin Valley section that he is back on the air in his new QTH, 1063 Paradise Road, Modesto. At present Tony is on 75 meters. QYQ is

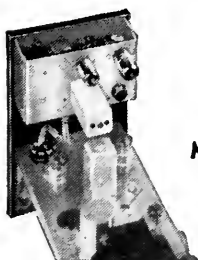
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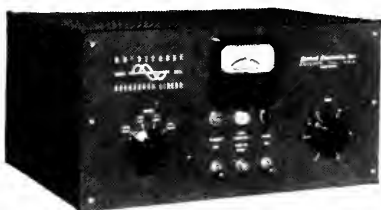
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- Bandswitched 160 — 10 Meters
- Magic Eye Carrier Null and Peak Modulation Indicator

Choice of grey table model, grey or black wrinkle finish rack model.  
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- Perfected Voice-Controlled Break-in on SSB, AM, PM.
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- 10 Watts P.E.P. Output SSB, AM, PM and CW.
- Multiband Operation using plug-in coils.

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“Advertising is accepted only from firms who, in the publisher’s opinion, are of established integrity and whose products secure the approval of the technical staff of the American Radio Relay League.”

Quoted from QST’s advertising rate card.

**Amateurs and Electronic Engineers: Practically everything you need can be supplied by the advertisers in QST. And you will know the product has the approval of the League’s technical staff**

active on MARS nets. TYC is now with the telephone company, Sacramento, and is active in c.d. work at Carmichael. UM is active in c.d. AIN would appreciate some “needling” to get back on the air. Come on, Hank, after 35 years you shouldn’t need needling to get back on. K6BWC and his new XYL are honeymooning. QV1 is on RTTY. ICO lost his entire mobile whip. K6BYS is mobile on 160 meters. IZC moved to a new QTH. MWR has mobile installed in the pickup. Traffic: W6ZF 7, JDN 6, DWTW 2, GTG 2, K6KHE 1.

**SAN JOAQUIN VALLEY**—Acting SCM, Edward L. Bewley, W6GIW—SEC: EBL. RM: K6EVM. JPU, Ralph Saroyan, was nominated as SCM, and as his was the only name submitted he automatically becomes unanimously elected. Ralph is the EC in Fresno County, and has proved himself as a hard and conscientious worker for the good of his fellow hams. I feel sure that a better choice could not have been made and hope the gang will give Ralph the same splendid cooperation that I received during my term of office. Field Day once more was the main event of June. From the reports received here, it was equal to or better than last year. I received five Field Day messages, which is the most yet, indicating the section was well represented. FEA and WJF have moved to the Bay Area, but as yet have no permanent address. FEA attended the YLRL National Convention in Santa Monica. Gertie is the sixth district chairman. EBL reports his Heathkit DX-100 is an FB rig. According to most reports received the June c.d. alert drill was a success. It was the first in Stanislaus County to use ham radio, and many c.d. officials were surprised to find ham radio so efficient. The CVRC Picnic was a success and all who attended enjoyed themselves. Maybe it will be an annual event. Traffic: W6TTX 517, ADB 80, K6EVM 56, W6EBL 37, K6BMM 5, W6FEA 5, GIW 5, WJF 3.

### ROANOKE DIVISION

**NORTH CAROLINA**—SCM, Charles H. Brydges, W4WXZ—SEC: ZG. RM: VHH. PAM: ONM. The Piedmont Amateur Radio Club is active in Salisbury with a new air-conditioned shack. The club station, EXU, is on with a kw. EYZ did a fine job as NCS of the Tarheel Net during June. JZQ is new EC for several counties in the eastern part of the State. New Novices in the Charlotte Area are KN4DRV, KN4DHM, and KN4DWL. Two meters still is in the picture. RRH heard CVQ and is looking for a Charlotte station. HYT is now General Class and will be on 80, 75, and 40 meters with 100 watts. The Tarnetto Club operated SOD/4 on Field Day from a 40-ft. observation tower. HLY/4 was at Cowhee Bald, MOE/4 at Elke Mountain, NC/4 at Tanglewood Forest, and OXQ/4 at Rankin Lake. Two new YLs in Salisbury are KN4DTL and KN4DTC. ZG is moving to a new temporary QTH. Welcome to HIF from Atlanta and now in Fayetteville. Get all the publicity on ham radio you can in your local papers; it will let the public know how we work. The Forest City Hamfest was a big success. If you want to join the AREC (Amateur Radio Emergency Corps) please drop me a line requesting application forms. GHS is moving to Charlotte. The Greensboro Radio Club Field Day netted 596 contacts. One 30-watt and two 100-watt rigs were used. The Greensboro 2-meter Net still meets on 146.88 on Thurs. at 8 p.m. SGD reports the Tarheel Emergency Net now has very good participation. Even though 3865 kc. is our net frequency, fixed stations should not remain on the frequency all of the time. Mobile stations would like to work also. When you have a sked on the net frequency move off the net frequency when the contact is made and give mobile stations a chance. This idea came from many of the fellows throughout the State. Traffic: W4RRJ 50, GHS 11, ACY 7, BUA 6, SOD 5, BUW 3.

**SOUTH CAROLINA**—SCM, T. Hunter Wood, W4-ANK—HIDR has received the BPL Medallion from the ARRL as an award for making Brass Pounders League three times. The striking feature of this achievement is that it was all accomplished on ‘phone and he is the first South Carolina amateur to receive this award for traffic-handling. LXX was on 40-meter c.w. in the CD Contest and reports from the Florence group that VAM is completing a kw. rig and has a new 20-meter beam. SMI is on 75-meter ‘phone with 12 watts using Heising modulation and receiving good reports. ZUV reports working a VK on 40-meter ‘phone and is active on 75-meter mobile. ULH is building a new 500-watt handswitching final using 250THs. TSU is completing a kw. s.s.b./a.m./c.w. rig. AUL expects to be on 20-meter c.w. soon with his 500-watter. FXG is on 40-meter c.w. and plans to work 20-meter c.w. for DX. LLH is on 20-meter ‘phone and is planning a new antenna. Field Day activity within the State was high this year with more club groups participating than in previous years. The C.W. Net operates on 3795 kc. at 7 p.m. weekdays. Traffic: W4HIDR 162, ZIZ 137, FFH 103, ANK 59, FML 16.

**VIRGINIA**—SCM, John Carl Morgan, W4KX—SEC: RTV. This year showed a new high in Field Day activity, both by clubs and individual groups. BLR produced a new tax exemption for OM BVB. New VFN Mgr. YVG tried a new call-up system, but the majority voted preference for the old method so he went back to that after

(Continued on page 96)

# MALLORY HAM BULLETIN

## You'll like every feature of the New MALLORY VIBRAPACK® Power Supply



Designing a battery-operated mobile rig? For the power supply, take a look at the features that are built into the new Mallory Vibrapack.

**HEFT IT**—the Vibrapack fits easily into the palm of your hand. It's less than 5½ inches in its longest dimension.

**CHECK ITS WEIGHT**—it's barely 4 pounds.

**LOOK INSIDE**—its sturdy steel cover and bottom plate snap off quickly, without need for struggling with screws or complicated fasteners.

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**ASK** any police radio engineer about the long life and dependability of its series-drive, heavy-duty communications vibrator . . . the same components used in police, taxi and utility 2-way mobile gear everywhere.

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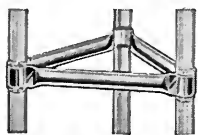
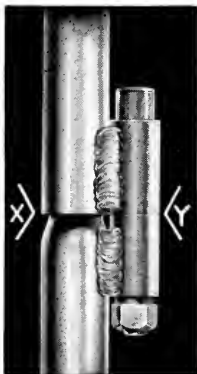
Safe in 80 mph winds without ugly, hazardous guy wires (something the XYL will like). Install a Kuehne tower yourself on roof or ground. It goes up quickly, easily, at low cost. Tested and proved for miniature arrays. Accommodates 1½" mast and rotor. Built of 16 ga. cold-rolled steel sections reinforced with steel gird-around ties spaced 12" apart. Zinc electro-plated finish. Cadmium-plated connecting hardware. Assembly blueprints furnished upon request of purchaser. One year parts guarantee. Order from your Kuehne Distributor. If none nearby, we will ship to your door.

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two weeks. VN is continuing its full schedule during the summer, but Manager PXA says QRN is plentiful and traffic isn't. 3DWP, of K4MC, is donning double harness. Don says the XYL-to-be can expect a new rig (harm) for a wedding present. Ardent contester JIJ was Virginia winner in the Vermont QSO Party, and placed third in the YL/OM fracas. IA/TFX and menage moved to Warrenton. YZC/YE/KN4CAX say the new QTH looks good. One Field Day note came from BYZ, who says he and EGA went to White Oak Mt. Result — no contact, ten chigger bites. That's starting from scratch, eh? K4NCP, at Dam Neck now has 5 General and one Novice Class operators. KFC worked KC6CG for No. 228. BZE has the neighborhood wrapped in wire, judging from his reports of antenna experiments. IF says KRR is back in Portsmouth and KN4CQZ is out of the Navy and has returned to Indiana. PFC BPLed again. K4ASU is promoting ham radio among fellow instructors at the Navy Radio School and is readying the school club station. Note to all net stations, if you feel you rate a certificate drop the SCM a card. He may be assuming you already have one. Remember the Virginia QSO Party Sunday Sept. 11th at 0800-2000. Details elsewhere in this issue. Hope C U all. Traffic: W4PFC 890, K4ASU 215, W4BLR 174, K4MC 164, W4CGE 157, WDZ 58, YZC 56, CFV 47, YKCB 37, AAD 35, YVG 24, TVO 20, BYZ 11, TFX 10, TYC 9, SIE 8, KFC 6, K4NCP 6, W4BZE 4, IF 4.

## 1955 VIRGINIA SECTION QSO PARTY

Sunday, September 11th

A QSO Party, open to all Virginia hams, will be held between the hours of 8:00 A.M. and 8:00 P.M. EST on September 11, 1955. Any band or mode may be used, but only one QSO per station per band (except for mobiles) is allowed.

Information to be exchanged consists of Number of QSO, RS or RST report, County in Virginia, and operator's "handle." Example: W4YYY, working W4XXX for his tenth contest QSO, sends him "NR 10 W4YYY 599 CLARKE (COUNTY) IGNATZ." W4XXX then sends a similar message in return.

Scoring: Between General Class or higher licensees, score 1 point for each message sent and for each received, or a maximum of 2 points per contact. For each message sent and received where at least one end of the QSO is a Novice (i.e. Novice to Novice, or Novice to higher class licensee), score 5 points, or a maximum of 10 points per contact. Multiply total number of contact points by the number of different stations worked, and multiply that in turn by the number of different counties, to determine final score.

Call "CQ VA" on c.w. and "CQ Virginia Section Party" on 'phone. General or higher class licensees should call "CQ VA WN" to indicate they intend to listen within the appropriate Novice sub-band. Novices should listen outside the nearest sub-band limit for calls from higher class licensees.

Mobiles operating in more than one county may be worked once in each different county by a fixed station. Similarly, a mobile operating in more than one county may count the same fixed station as another contact from each new county.

Good rallying points include the Virginia Net frequencies, 3680 and 3835 kc.

Abstracts of logs should be mailed to SCM W4KX not later than October 1, 1955.

**WEST VIRGINIA** — SCM, Albert H. Hix, W8PQQ — SEC: GEP, PAM: GCZ, RMs: DFC, GBF, HZA, and JWX. I would like to take this opportunity to announce that GEP is the new SEC. It is requested that the ECs put on a drive to obtain greater AREC membership. Cooperation on the part of hams registering for the AREC will be appreciated by all concerned. The Naval Research Radio Club of Washington, D. C., operated Field Day at Raven Rock, W. Va., with 6 rigs. Several clubs were active in Field Day this year. GBF and PZT again are to be congratulated on their excellent frequency measurement results in the recent Test. OIC is putting up a 1250-ft. long wire. IWB has a new Ranger. CLX now is s.s.b. GCN is doing a bang-up job on s.s.b. NLT has a 40-ft. tower and will have a new beam soon. A Johnson KW, exciter, and auxiliaries have been purchased by the State for installation in the Capitol Building. This equipment is for RACES; however, it also will be used on the ham bands. A special room is being made available for it. CKW and AII were home recently. PNR is building a new kw. rig. 4ALR, of Louisville, visited PQQ recently. Fellows, please send in more activities information. UYR is ORS. N8VMM is active in Sinks Grove. JGI works 14-Mc. c.w. Traffic: W8HZA 60, GEP 19, PZT 12, PQQ 7. (Continued on page 98)

# match almost any tube with

## CHICAGO STANDARD

### "POLY-PEDANCE"

## MODULATION

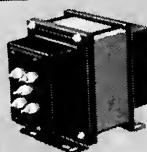
## TRANSFORMERS

These multi-tapped Stancor transformers will match all common impedances of Class "B" modulators to Class "C" load impedances of 2,000 to 20,000 ohms. With these versatile units in your rig you can change transmitting tubes or operating characteristics without having to invest in a new modulation transformer.

PART NO.	MAX. WATTS	MAX. D.C.	MTG. TYPE	LIST PRICE
A-3891	15	Pri—100 ma Sec—100 ma	D	\$13.60
A-3892	30	Pri—150 ma Sec—150 ma	D	17.20
A-3893	60	Pri—180 ma Sec—180 ma	D	18.60
A-3894	125	Pri—225 ma Sec—225 ma	D	22.50
A-3898	300	Pri—260 ma Sec—260 ma	FS	70.65
A-3899	600	Pri—500 ma Sec—500 ma	FS	140.70



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There are many other Chicago-Stancor modulation transformers, for every class of operation, from this



5 watt, 1 pound, Stancor unit,  
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For r-f output of 50 to 250 watts, or audio output up to 325 watts, the PL-6549 outclasses all other transmitting-type tubes. The beam pentode construction improves linearity—provides distortion-free high peak power output in audio or linear r-f amplifier service.

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<b>Filament—Thoriated Tungsten (quick heating)</b>	
Voltage .....	6.0 volts
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Plate Voltage, Max. ....	2000 volts
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Screen Voltage, Max. ....	600 volts
Plate Dissipation, Max. ....	75 watts

A four-page technical data sheet giving suggested operating conditions and application information is available. Ask for data file No. 901.



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## ROCKY MOUNTAIN DIVISION

**COLORADO**—SCM, Karl Brueggman, W0CDX—This month's report was written by KQD. Stations earning Section Net certificates on CSSN since last December are K0ANZ, W0TVI, W0PGN, K0WBB, W0KQD, and W0TUT. CSSN is taking a vacation from July 1st to Oct. 1st. During this year's Operation Alert all ten Mutual Aid Areas were represented for the first time on the State RACES Net. State Radio Officer WIR had activities at state level very well organized. HNN had a picnic at Salida on June 5th attended by 44. The Sky Hi Radio Club has 3 clergymen among its members, also 2 new licensees, W0XQ and KN0AXC. K0WBB missed BPL for the first time in 7 months. KN0BUL is a new licensee in Salida. MYX is on with 100 watts, 'phone and c.w., at the home station now. OGO is a new HNN member. KHQ hopes to be on the air soon with a Viking II. K0ANZ has gone home to California for the summer. PBN is returning to California where he will be stationed at Hamilton AFB. PGN serves as net reporter for CSSN and LNH for HNN. MFF has graduated from 7 watts to 70 watts. About 35 people attended the hamfest at Estes Park on June 18-19. IA reports that 9 Boulder operators participated in Field Day activities with one 30-watt transmitter and made 162 contacts. NVX checked into HNN as K0WAR from Ft. Carson while on two weeks duty there. IUF is moving to Denver. YNC now is living in Woodland Park. WFR won the mobile station offered as pre-registration prize at the Albuquerque Hamfest. AGU operated mobile and DRY portable for several days at Beaver Creek camp. Traffic: (June) K0WBB 365, W0KQD 274, K0FAM 127, W0PGN 67, NVX 32, TVB 32, EKQ 31, BEN 27, YMP 21, NVU 19, UNM 10, HOP 9, YNC 9, IA 7, SWK 4, OMN 3, UMS 3, LEK 2, SKK 2, OGO 1. (May) W0NVU 194. (Mar.) W0YNC 118.

**UTAH**—SCM, Floyd L. Hinshaw, W7UTM—Summeritis has hit the Utah section! Everyone seems to be on "vacation" as far as news items are concerned. SAZ says Eric has received his Novice call, WN7AAN, after a long wait. OOK has been appointed liaison station on the MARS Governor-to-Commanding-General Sixth Region for emergencies. LQE and VTJ were mainstays on c.w. for the Ogden Club at Snow Basin. RQT had his kw. 'phone rig out for Field Day also at Snow Basin. The Ogden Club was the only Field Day group to forward the SCM message this year. Traffic: W7UTM 2.

**WYOMING**—SCM, Wallace J. Ritter, W7PKX—WNA has moved to Rapid City, S. D. IJW will become new club president. A CAP unit is being organized at Newcastle. HDS reports several new Novices at Cheyenne, and a new operator for the MARS station. There was not much activity on Field Day in Wyoming with only PSO operating portable. The Wyoming section did very well in the c.d. alert Lemon Juice even though no RACES set-up was in operation. All c.d. traffic handled had prompt replies with one exception. HDS and UZP are holding down the Pony Express frequency during the daytime and did a bang-up job. Traffic: W7PKX 86, HDS 76, MNW 21, PAV 16, YSF 8.

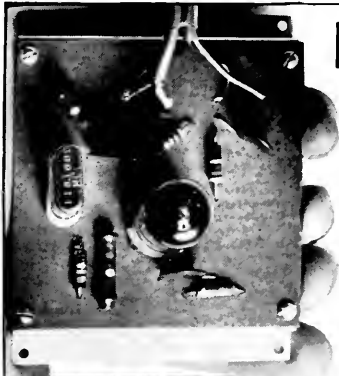
## SOUTHEASTERN DIVISION

**ALABAMA**—SCM, Joe A. Shannon, W4MI—SEC: TKL RM: KIX. PAM: WOG. New officers of the Birmingham Club are UEI, pres.; HVH, 1st vice-pres.; BMV, 2nd vice-pres.; KNW, secy.-treas.; YEP, rec. secy. WOG still is chasing DX and coming up with some good ones; he also participated with the Tuscaloosa Club in Field Day. DTT, TWK, and K4AOZ are feverishly working on mobile installations. The Huntsville Club now has a club call, K4DTV, with IHH as custodian. ZSH has moved and is now located two blocks from VLY. CAH took third place in mobile transmitter hunts at both the Pensacola Fest and the St. Petersburg Convention. USM has the Lyseo 600 going at Auburn and is regularly on AENB. KN4CWE is new in Carbon Hill and is giving a Globe Trotter a good workout. DGN is heard on 75 meters occasionally from Decatur. K4AOZ-K4APF are blasting a hole on all bands with the newly-acquired Globe King, and planning an emergency power plant. EBD reports a total of 188 call-ins on AENK during June with three new mobiles, WLM, EFF, and K4CYB. ZSQ has the 20-meter beam up and has acquired a Super Pro. PRS reports good hunting on 2 meters. GOL has a new jr. operator, Nancy Carol. VDK and VDL are listening on a new 75A-3. Traffic: (June) W4HKK 180, YRO 78, WOG 70, KIX 65, DTT 35, ZSQ 27, TKL 26, ZSH 21, QAO 14, CAH 11, EJZ 10, MH 9, TXO 9, EVO 4, TWK 2, USM 2. (May) W4OAO 29.

**EASTERN FLORIDA**—SCM, John W. Hollister, jr., W4FWZ—Looks like June Field Day went over in a big, big way. Radiograms were received from K4DPZ, K4NRC, K4ANW, W4DU, NEK, NVU, PLB, YI, YKY, and ZBA. As usual, Jacksonville and Miami had big turnouts. An excellent report from IYT reflected results of careful planning. Daytona: FSS uses a T-90 and says that AYD is portable in Okeechee (June) and also FEL has returned from near WSM! Lake City: Realizing that his city had no amateurs YNM obtained a ticket and in a year coached more than 14 fellows. His AREC has 13 members. That

(Continued on page 100)

**HOW TO ORDER:** In order to give the fastest possible service, crystals and oscillators are sold direct. Where cash accompanies the order, International will prepay the postage; otherwise, shipment will be made C. O. D.



# FO-1 PRINTED CIRCUIT OSCILLATOR

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The FX-1 Crystal is designed for use only with the FO-1 Oscillator. For tolerances of .01 % and .005 %, any FX-1 Crystal can be used with any FO-1 Oscillator.

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Tolerance	1000-1499 KC	1500-1999 KC	2000-9999 KC	10,000-15,000 KC
FX-1 .01%	\$5.25	\$3.75	\$2.50	\$3.25
FX-1 .005%	\$6.00	\$4.50	\$3.00	\$4.30
{.0025% and .001% tolerances are available only by purchasing the FO-1 Oscillator and Crystal together}				
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\*Prices are for crystal only. To insure this tolerance crystal must be purchased with oscillator factory wired and tested. For total price add \$6.95 to price of crystal desired.



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**.01 % TOLERANCE**—Crystals are all of the plated, hermetically sealed type and calibrated to .01 % or better of the specified frequency. See specifications below:

**Holders:** Metal, hermetically sealed, available in .093 dia. pins (FA-9) or .050 dia. pins (FA-5).  
**Calibration Tolerance:** ±.01% of nominal at 30° C.  
**Temperature Range:** -40° C to +70° C.

**Tolerance over temperature range** from frequency at 30° C ±.01 %.  
**Circuit:** Designed to operate into a load capacitance of 32 mmf on the fundamental between 2000 KC and 15 MC. Designed to operate at anti-resonance on overtone modes into a grid circuit without additional capacitance load. Write for recommended circuits.  
Orders for less than five crystals will be processed and shipped in one working day.

## PRICES FA-9\* (Pin Diameter .093) \*

PIN Spacing .486 (*FA-9 fits same socket as FT-243)	RANGE	TOLERANCE	PRICE
Fundamental Crystals			
	1500-1799 KC	.01%	\$4.50
	1800-1999 KC	.01%	\$3.90
	2000-9999 KC	.01%	\$2.80
	10000-15000 KC	.01%	\$3.90
Overtone Crystals			
(for 3rd overtone operation)			
	15 MC—29.99 MC	.01%	\$2.80
	30 MC—54 MC	.01%	\$3.90
(for 5th overtone operation)			
	55 MC—75 MC	.01%	\$4.50

## For Commercial Use F-6 Series 1000KC to 60MC

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**Holders:** Metal, hermetically sealed.  
**Calibration Tolerance:** ±.0025% of nominal at 30° C.  
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**Range:** ±.002% from -30° C to +60° C.

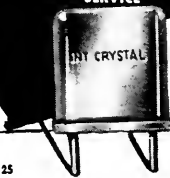
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**Circuit:** As specified by customer. Crystals are available for all major two-way equipments. In most cases the necessary correlation data is on file.  
**Drive level:** Maximum—10 milliwatts for fundamental, 5 milliwatts for overtones.

F-605	F-609	F-612
Pin dia. .050	Pin dia. .055	Pin dia. .125
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Pin spacing on each of above is .486

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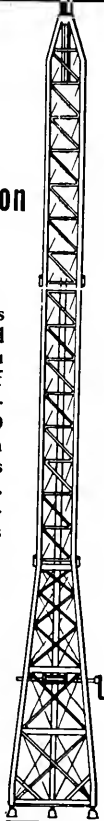
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took real work plus a strong desire to bring ham radio into his city. Thanks, Harry, and the gang: CYG, EGY, EGS, BKV, EGV, ADU, KNs BNO, BOS, DOF, BLL, DHK, and DON. Masaryktown: WN4HSN was high school valedictorian. Miami: A card from ES says he is a ranch-owner. Alonzo also says that GJ gave all his gear to LJM. KN4DRD is new, thanks to DJY. Bird Sparks: ZGL got his General Class license. JCG, DTJ, and WYR were on the WAHR ham hour. The Flamingo Net is now 2½ years old and can be placed high among nets of national interest. Ocala: DVR's NYL is now K4DQG. The Red Cross Emergency Net is composed of DVR, HCQ, HJF, ASH, and K4ANJ. Tampa: TYE meets 7 c.w. nets and 2 phone nets. Bob reports his new Viking Adventurer exciter is a help. General: NW is now MO for the Knights of the Kilocycle. Dan also is president of the FBA. Resolve now to overhaul the emergency gear and join a traffic and emergency, net. Ask me about 'em. Oh yes, the AREC is sponsored by ARRL. Affiliated Clubs sponsor ARRL activities at the local level. Traffic: (June) W4PJU 516, TYE 369, DVR 110, WS 54, WEO 35, FSS 32, LAP 30, BZI 22, IYT 19, ELS 13, FWZ 12, PBS 7, HDU 6. (May) W4IM 4, YNM 3, HDU 2.

**WESTERN FLORIDA**—SCM, Edward J. Collins, W4MS/RE—SEC: PLE. ECs: HIZ and MFY. K4AKP makes BPL for the fourth straight month. KN4ADY and KN4AEP are working hard to get their General Class licenses. BGG still is trying to find an antenna to fit his yard. GMS is working hard on a 15-meter beam. ZFL keeps the Pensy Radio Club transmitter hot. MUX is back from DX-Land. AXP is always improving his rig. CCY still is trying to put the last watt into the air. Hi, FHQ has a new project going. RUF swears by his Viking 11. YES won the DX-100 at the Pensy Hamfest. PQW missed a hamfest!! MS has the 5100-51SB going and is after s.s.b. WAC with low power. HJA has the mobile gear installed and perking FB. CQX is keeping Crestview represented. FDL and UC still are keeping the gang supplied with parts. KN4CLJ is improving the code speed. KN4DAF is putting out an FB signal. DAO/DEF keeps 75 meters hot. RZV still is kingpin of the Dagwood Net. PAA is planning a tower and beam. TTM/PTK are heard now and then. KN4AGM is going after her Technician Class license. Ed Handy's visit to the Pensy Radio Club was enjoyed by all. VR gets out FB on 7 Mc. JPD keeps the 5100 on 7 Mc. also. K4BZX has been transferred. EAR wants more audio. Traffic: K4AKP 611.

**GEORGIA**—SCM, George W. Parker, W4NS—SEC: OPE. PAMs: ACH and LXK. RMs: MTS and OCG. Nets: The Georgia Cracker Emergency Net meets on 3995 kc, Sun, 0830, Tue, and Thurs. 1900 EST: Georgia State Net (GSN) 3590 kc. Mon. through Fri. 1900 EST; Atlanta C.W. Net 7040 kc. Sun. 2100 EST. YTO is starting an antenna farm. He now has 3 poles set complete with a pair of woodpeckers in each pole. BXV is getting good reports from DX on his 45-watt 7-Mc. rig, and is looking for a Utah contact for WAS. BQT is building a sideband rig. Heard on 40 and 80 meters were KN4ANZ, APC, and DKM. CFJ operated 21 hours during the recent Operation Alert with the help of OPE and UMM. BAI (13 years old) is NCS of GSN. BWD is going mobile. IHF has moved to North Carolina. 6CDU paid a visit to the shack of FZO recently. FYC now has emergency power and is C.D. Radio Officer for Lamar County Area. BXV and BYJ are new Class IV OOs. All appointees are requested to check the dates on their certificates and send them to the SCM for endorsement if over one year old. Field Day messages are acknowledged from CVY/4, BKM/4, GNV/4, MQN/4, and ZOA/4. The entire Georgia gang had an FB time at the St. Petersburg Convention. NS has a new DX-100 on the way. YWP has his on the air. ZD and TT attended the Mobile, Ala., Hamfest. Traffic: W4CFJ 4360, P4M 356, OCG 303, DDY 55, HYV 50, IMQ 32, BWD 23, NS 22, ZUF 18, MTS 16.

**WEST INDIES**—SCM, William Werner, KP4DJ—DV renewed ORS and OBS appointments. WT finally got on with an 813 and acted as NCS of the 3925-kc. Emergency Net. ES is using a B&W s.s.b. generator to drive a 32V-3. MP is testing a kw. s.s.b. transmitter and has a new Moseley V.P. beam. ABA has cathode modulation working fine. W5VUP and W6OXS visited KP4- and KV4-Land. ABD is active on 20-meter phone. AK, AAA, AAM, ABA, ABN, DC, DJ, DV, and HZ operated at Isla Cabras on Field Day. ABD, ACF, BJ, CC, CU, KD, LK, MV, NL, QA, and VH visited Field Day operations. AAN, ABN, and ACH are on 144 Mc. with Gonsset Communicators. Emergency frequency allocations for Puerto Rico are 3825 kc. Arecibo, 3850 Guayama, 3865 Virgin Islands, 3885 San Juan and Fajardo, 3900 Ponce, 3925 Island Net frequency for NCS and District NCS only, 3950 Caguas, 3960 Aguadilla, 3980 Mayaguez. DP has 20-meter Tel Rex and new tower with rotator. MS mounted his 20-meter Tel Rex on retractable 30-ft. tower. MV brought his 20-meter Tel Rex to Field Day operations. CO, WT, ES, WR, DV, RC, DJ, HZ, R1, QM, MC, HM, PW, VH, QA, RE, QF, ZW, WW, KV4AA, and BA participated in Operation Alert. LK is putting up all-band vertical. KD and his son BJ were initiated into the Royal Order of the Wouff Hong at the South-eastern Division Convention. CC received a QSL card from DU7SV for a 3.5-Mc. QSO. NY sends greetings from Marcy, N. Y., Police Dept. and is planning an amateur radio

(Continued on page 102)

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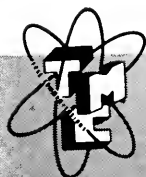
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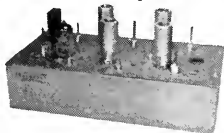
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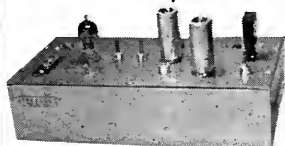
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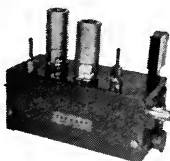
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auxiliary composed of AREC members in the various towns to cooperate with police and operate amateur transmitters from police stations emergency power supplies. If interested, contact Lt. Pabon, KP4DC, or your SCM, Aug. 13th was the 18th anniversary of the PRARC. Traffic: KP4WT 177, ID 54, MC 33, WR 5, DJ 4, KV4AA 4, KP4QA 3, KV4BA 2, KP4ES 1, QF 1, WW 1.

**CANAL ZONE**—SCM, Roger M. Howe, KZ5RM—Field Day was lots of fun. Location this year was the village of Gamboa where 3 transmitters were kept on the air (2 simultaneously) for 24 hours on 10, 15, and 20 meters feeding cubical quad antennas. Workers and phone operators, under the able co-chairmanship of CF and RV, were VR, LB, GF, BD, HO, JJ, WA, and JJ's XYL. Burning the midnight oil on c.w. were veterans BR, BC, and GO. Among the visitors were PB, NM, JM, MJ, FL, BC, and AE. Vacationing KZ5s are spread out like this: LR, Corpus Christi; DG and GD, en route from Santa Monica (where DG attended the YLRL Convention) to Seattle; RM, Miami; PL, Newport Beach, Calif., and en route to Honolulu; PP, El Monte, Calif.; JD, Chicago; VP and "Bill" (W5URJ-75 from KZ5CS) in Corpus Christi, with 11 prospective fathers from Coco Solo, Canal Zone, on temporary duty Stateside for a few weeks, and are they keeping the traffic circuits busy with news from the hearthside! W5LUH, Roger, PAA, flew down here twice for visits in June. Traffic: KZ5WA 154, RV 37, BR 25, RV 12.

## SOUTHWESTERN DIVISION

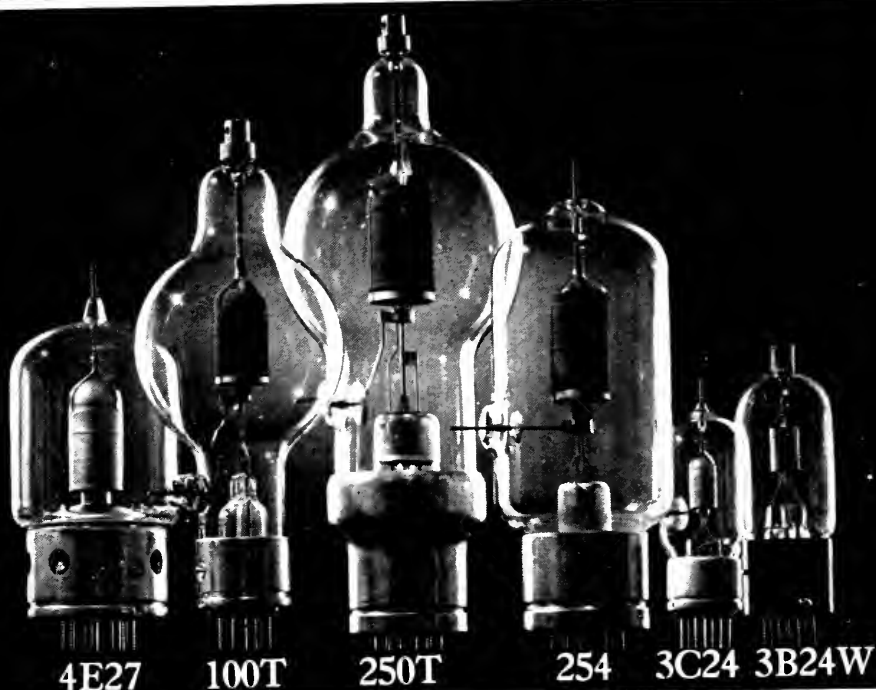
**LOS ANGELES**—SCM, William J. Schuch, W6CMN—SEC: QJW. RMs: BHG, GJP, and K6DQA. PAMs: PIB and YVJ. K6IYF received an RCC certificate. K6HBA has ITV. NTN. has the clicks in the GO-9 licked and again is active. Traffic-minded hams should contact K6DQA, manager of SCN. He needs help. K6BEQ now is 144-Mc. mobile. AM is running 25 watts at his town house, 900 at the ranch. HIF is very QRL at his job of railroad. YVJ is moving to a new home in West Valley. K6EA is QRL with paint brush on the shack and also is working MARS. KN6HOV dropped the "N" from his call. K6COP worked his first VS. The San Fernando gang holds bi-monthly transmitter hunts. All comers are welcome. Contact MEP, CHR, or HGZ for information. The San Bernardino Micro Wave Society worked Field Day on 56, 144, 220, 2400, and 3400 Mc. and came up with a total of 306 stations for a score of 6165 points. A new net is operating on 6 meters and is tied in with the 2 x 4 Net. It is called 2 x 6; K6HKS is net control. Most OOs report they could have done a bang-up business on Field Day. CMN, GJP, and GYH will be at Needles for the Marathon Boat Races Oct. 2nd, a yearly chore for them. ESR has a new 14-Mc. beam. The Beachwood Amateur Radio Club meets in Hollywood. Contact K6ELX for the dope. RRU and MBA have finished "Q" multipliers and report great results. The Hughes Aircraft employees have formed a new club. Contact K6HKE for information. So many clubs have sent in information on Field Day that it would be impossible to enumerate them all here. By the looks of some of the scores the West Coast should place well up in the national percentage. KN6ITO is Mayor of Avalon. K6DBI and W6EAB are on the technical staff of KBIG, Catalina Island. Thanks, Mel. KZ5BE visited W6GYH and BP. Reports are coming in late, gang; help me out by getting them here immediately after the first. Thanks. Traffic: W6GYH 285, K6EJT 271, DQA 159, W6MBW 152, BHG 138, WPF 128, USY 114, CAK 39, K6COP 39, HOV 33, W6CK 24, ORS 20, K6EA 17, W6YVJ 16, CBO 14, K6KCI 12, W5NTN 11, WT 11, GJP 10, HIF 9, K6IYF 8, W6AM 6, K6ELX 6, HBA 3, BEQ 1, LTA 1, UED 1. (May) W6MBW 413, TDO 87, KN6JJN 6, W6NTN 1.

**ARIZONA**—SCM, Albert H. Steinbrecher, W7LVR—Asst. SCMs: Kenneth P. Cole, 7QZLH, and Dr. John A. Stewart, 7SX. SEC: VRB. PAM: KOY. Arizona 'Phone Net: Tue. and Thurs. 7 p.m. MST, 3865 kc. The month of June saw quite a bit of activity around the State. The Nationwide Civil Defense "Operation Alert" embraced 40 operators located in 14 communities in Arizona. The following towns and calls were represented: Phoenix: KOY and RBA were NCS for the State, with QZX and YFG located at State C.D. Headquarters. Other Phoenix stations were MAE, MQW, NCL, QZH, SUL, UYA, and mobiles JLW, NAP, and TNY. Tucson: LAD was NCS at C.D. Headquarters with LHD and ULP. Mobiles located around the City were: LVR, MOB, MQE, QHD, RNB, STV, UCX, VZJ, and YXE. Flagstaff: LSK. Fort Huachuca: 5GK. Fry: MES. Gila Bend: LFZ. Globe: PKM. Kingman: UNK. Morenci: LZT and PXM/M. Payson: VYM. Prescott: OPY. Weldon: RIP. Winslow: PJY. Yuma: OFA, TJT, and WBG. The OPRC elected MOB, pres.; ULP, vice-pres.; LAD, secy-treas. Field Day found 4 groups active around the State: Yuma: ACN, BMC, EYT, JNY, OEE, OFA, SNR, TJT, WNO, WRP, ZTA, ZTR, ZZZ, 0ICF, and 6ANI were at Boy Scout Park. Other groups were on Mount Lemmon, with LMP and PZ on Mingus Mountain and Mt. Union. WUG has left for CT2-Land and will be on the lookout for Arizona contacts. His call will be CS5AC. Traffic: W7WUG 54, LVR 16.

**SAN DIEGO**—SCM, Don Stansifer, W6LRU—All are

(Continued on page 104)

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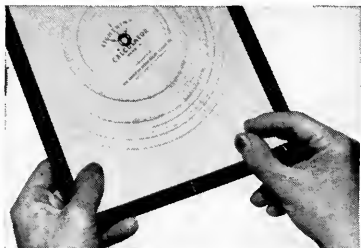
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reminded that the Southwestern Division Convention will be held Sept. 30th, Oct. 1st, and Oct. 2nd in San Diego. Everyone is invited. WYA, convention chairman, has returned from the East where he visited Headquarters. A new club, the Mike and Key Club, is desirous of affiliation with ARRL. Officers are: K6DVD, pres.; K6CJS, vice-pres.; W6URP, secy.; and K6JHD, treas. They invite any interested parties to contact URP. Most members are from the Lemon Grove/La Mesa/Encanto Area. IAB, at Camp Pendleton, is on 2 meters with 100 watts. BAM, old-time DXer in Santa Ana, worked VQ6LQ and hopes to reach 200 countries some day. Ex-KH6AJF and K7L7BLG now are operating from YDK. KL7MF, ex-SIG; ex-MI, and his wife, Louise, were recent San Diego visitors while on vacation. The picnic at Orange County Park was very successful, as was the Upper Ten Picnic at Cardiff. OZO is sporting a new Communicator on 2 meters. Two fine examples of amateur public relations were evident recently when stations were manned at the Orange County Home Show and the San Diego County Fair. Credit goes to VFT, the SEC, and the AREC members who manned the station at the San Diego Fair with an impressive array. CAE has passed the 170 mark in countries worked. CRT still is working new ones. WNN worked VS4CT in Sarawak on 14-Mc. phone. ZWK also is heard working DX on 14-Mc. phone. LRU has a 75A-1 and still is hunting for country No. 200. Field Day is over, and from all indications the largest turnout in the section in history was recorded. Some very terrific scores were run up, and a good time was had by all participating. Traffic: W6LAB 2581, YDK 1514, K6DBG 26.

**SANTA BARBARA** — SCM, William B. Farwell, W6QIW — New appointments: K6KPU as SEC; KCD as ORS and OPS. Glad to have K6KPU as our new SEC. We know he will make a good one. KFM is new Communication Chief, C.D. and Disaster Corp. Santa Barbara. JCQ is Communication Chief for Region Seven. Congrats to KN6LFQ on getting his ham ticket the hard way. He is blind. GYI is stationed on desolated San Nicholas Island. KN6JUN has a new four-element beam on 145 Mc. WYN has gone with the Navy to Hawaii. K6CNY is conducting a code and theory class. All the clubs in the Santa Barbara section were very active on Field Day and your SCM received Field Day messages from all. QHC puts out a potent signal on s.s.b. Traffic: K6NBI 85, W6QIW 56, NKT 26, BRY 18, K6CNY 11, KPU 9, W6YCF 5, PKW 2.

## WEST GULF DIVISION

**NORTHERN TEXAS** — SCM, T. Bruce Craig, W5JQD — SEC: RRM; PAMs: PAK and IWQ. RMs: PCN and QHI. QDF is out of the Air Force and attending Tech College. K5FID now is the call at Reese AFB, Lubbock, with ZFB as chief operator. The Panhandle Amateur Radio Club at Amarillo announced new officers are SOC, pres.; YYR, vice-pres.; CKV, secy.-treas. AHC served as relay in long skip from Lubbock to Ralls when a storm destroyed communications. JQD handled only a few messages through IWV. NTX (No. Tex. C.W. Net) meets on 3770 kc. at 1845 daily and needs more stations. The Snyder Amateur Radio Club had a pleasant surprise June 21st when Milt Russel, DL4FZ, from Germany, dropped in to visit and join the club. WN5GTW reports completion of WAS. Regan County Amateurs (Texon) report a good Field Day; a new ham is KN5BBO; WWF furnished the transmitter for Field Day; GKY uses a 33-ft. vertical made from telescoping TV mast and works FB on 40 and 15 meters; WNJ/M received Q5S9 from Guam on 40-meter mobile. ACK plans a new transmitter with grid-block keying. K5FFB is net control of the Yankee Net (0900 on 7290 kc. daily). DTA/5 reports WAS on 75-meter c.w. with 65 watts. NFO reports the Terry County Radio Club will have a hidden transmitter hunt. MBP reports 82 per cent attendance on the Blue Ridge Net (160 meters) for June. LR (originally W5LY) has returned to Dallas after 2 years with the FCDA in Chicago. He reports the Oak Cliff Radio Club is in the planning stage. ACU, JUN, and JQD vacationed in New Mexico and worked PTK (the son of JQD) on regular schedules. Traffic: W5KPB 185, UBW 144, CVA 124, FJB 120, AHC 91, PAK 64, CF 33, TFP 33, ACK 32, CVW 25, ZTB 16, ASA 13.

**OKLAHOMA** — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Canady, 5GIQ. SEC: KY. RM: GVS. PAMs: PML, SVR, and ROZ. The high point of the month was, of course, the West Gulf Division Convention at Fort Worth, which was excellently managed and had a wonderful attendance, giving many of us a chance for a QSO "vis-a-vis" with those we had been meeting on the air for years. Many questions were thrashed out at the various sectional meetings. The Bar-B-Q and dance was well attended and only marred by the sudden death of IIK. One of the fine things at the Convention was the presentation, in absentia, of a scroll signed by the net controls of the North Texas-Oklahoma Traffic Net to PAK in recognition of his splendid services as net manager. Everyone who attended seemed satisfied that CF had been elected Director of the West Gulf Division. The Watonga Ham Picnic was reported a success by all. We expect good results from JCB, new Oklahoma County EC. DFV is the New Payne County EC, succeeding TKE. GVV should be heard more often on ham

(Continued on page 106)

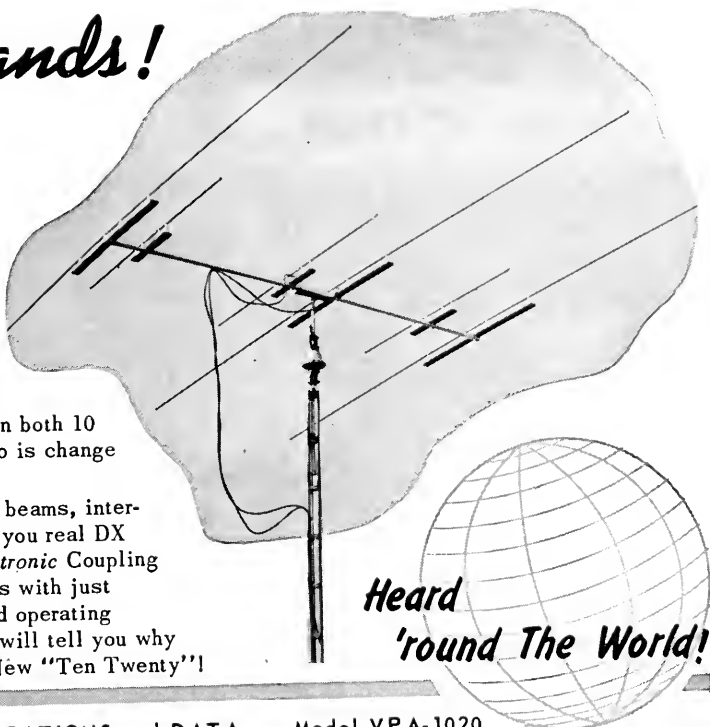
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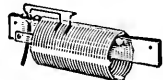
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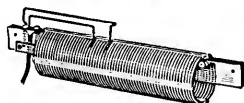
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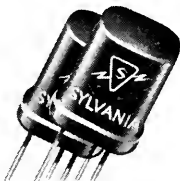


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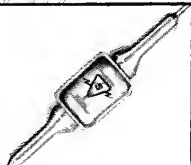
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2. Two Sylvania type 2N35 transistors



3. A 1N34A crystal diode



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frequencies with a DX-100. The Oil Capital Mobile Club is active and thriving. The Tulsa Central ARC has its club call and used it Field Day. It's too bad that many club calls are heard only on Field Day. Traffic: W5GVS 325, KY 42, FEC 32, PML 30, QAC 29, CBY 26, ADC 24, RST 23, CFG 20, HCG 14, PNG 14, SVR 7, GXH 6, ITF 6, TNW 6, BBB 5, TKI 4, UCT 3, VAX 3.

**SOUTHERN TEXAS** — SCM, Morley Bartholomew, W5QDX — SEC: QEM. The Fort Worth Convention was a big success. The guys and gals who spent much of their time to put on the show deserve a vote of thanks. Galveston was selected for the 1956 Convention. VUS, Galveston Area EC, has that section ready for any emergency. AET, Hidalgo County EC, has spent more than two years to completely organize the hams there. Seventy-seven were in attendance July 3rd at a barbecue given by WIS at his farm. YXH spent several weeks in the hospital. According to last reports Vince is on the mend. URW has a new DX-100. The 144 and Up Club held its second V.H.F. Roundup July 3rd on the farm of FSC near Deanville. KN5BFJ has just gotten on the air. FND is on 2 meters, while DIC and HHO are busy completing their 2-meter rigs. The Texas YL Roundup Net meets each Thurs. 8:30 A.M. on 3880 kc. All YLs are invited to check in. NC is WXY, the alternate is ZPD. LOW is busy organizing the Corpus Christi emergency group. QZZ soon will be operating /KL7 from Anchorage. TQL is portable at Rockdale this summer. MN keeps regular schedules with KH6AJF. CTZ, DFA, EPZ, UNZ, WN5s HTE, HTG, and HTJ kept regular schedules with their families at Houston while attending summer encampment with the Texas National Guard at Fort Hood. Fellows, please send in your activities reports. Traffic: W5MN 299, URW 11.

**NEW MEXICO** — SCM, Einar H. Morterud, W5FPB — SEC: KCW. PAM: BIW. V.H.F. PAM: FPB. RM: JZT. The NMEPN meets on 3838 kc. Tue. and Thurs. at 1800 MST, Sun. at 0730; the NM Breakfast Club meets on 3838 kc. daily except Sun. at 0700-0830 MST. The NM C.W. Net meets on 3633 kc. daily at 1900 MST. ZU and his XYL, CEE, and your SCM attended the West Gulf Division Convention. NSJ is running 120 watts to an 829B on 50 Mc. and has worked 20 states; he also is building 50- and 430-Mc. portables. KWP is active on 50 Mc. and is building a 28-50-Mc. rig for mobile or portable. MYI is putting a 6146 on 50 Mc. and has a 1-watt 50-Mc. handy-talkie. MYQ is building a Ferriswheel for receiver alignment. RFF is building a 28-50-144 Mc. receiver with variable i.f. New appointees: NQG and ZU as ECs; MSG and WNU as OOs; RFF and WNU as ORSs. Many old appointments that were not endorsed have been cancelled. There are 64 active members in the Albuquerque, Los Alamos, Mesilla Valley, and Roswell Chapters of the Amateur Radio Caravan Club of New Mexico. KN5ADS, W5FAG, ECS, FJE, FMM, OAL, PIZ, UCX, VJN, and ZSL assisted in the Albuquerque Operation Alert. Hobbs, Los Alamos, Mesilla Valley, and Sandia Base Radio Clubs, K5ADQ, W5DAH, PIZ, WBJ, and W9TLM/5 participated in Field Day. Traffic: (June) K5FEF 171, W5CEE 31, RFF 28, BZB 9, ECS 2. (May) K5FHU 1119.

## CANADIAN DIVISION

**MARITIME** — SCM, Douglas C. Johnson, VE1OM — Asst. SCMs: Fritz A. Webb, 1DB, Aaron D. Solomon, 1OC. SEC: RR. From Field Day messages received, the following are calls of clubs or groups active on that week end: VE1s IM, CW, FO, RC, WO, ND, LC, SH, GM, DN, JV, VO 1T/VO2. VE1WL was active as a Class B station. Recent visitors to Halifax were W1TQP and VE2AHZ. The latter is known professionally as the "Great Morton." VC is busy putting the finishing touches to a new DX-100 transmitter. Bill reports the meeting of the Bathurst and Campbellton AREC each Sunday morning. IT is a new N. B. ham and operates 80-meter c.w. on the low end. Bouquets to KZ for his untiring efforts in providing hams with P.E.I. QSOs for the WAVE award. AEB is testing a new 60-watt official mobile unit and it promises to put out a husky signal from the Restigouche Area. Congrats to BN. In the recent Frequency Measuring Test Les came up with an average error of 21.7 parts per million. EF, QY, and OM have been busy giving out with N. S. QSOs on 50 Mc. during recent good openings. W2WSP has been heard mobiling in the Liverpool Area. Traffic: VO6AH 215, VE1FQ 122, AV 56, VO6AF 32, VE1UT 31, ME 16, GA 15, OM 8, ABZ 7.

**ONTARIO** — SCM, G. Eric Farquhar, VE3IA — Field Day in this section was most successful and now that it is over the gang is getting back to normal operation. While the summer lull is upon us mobilers and traffic-handling stations are active. Active in Alert No. 2 were FU, BKX, BIW, AHL, BY, IE, BUR, EAM, DU, and HO. BNQ, striving for WAPA, tallies 18 out of a possible 63 counties. The North Bay Hamfest again was voted the best yet. The last meeting of London Amateur Radio Club was very profitable to those attending, who heard YJ deliver an excellent discussion on antennas and transmission lines. YZ has a home-brew transistor receiver. BSD is the call of the Quinte ARC, Belleville. BCV is back on the air after a long absence. BSW vacationed in the Maritimes and

(Continued on page 108)



*"Worked 87 foreign countries, all continents and 30 zones" with a Gotham Antenna and 35 watts.*

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Florida, 1955

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I am able to keep schedule with amateur radio —\* in the Cape Verde Islands every week. *It was impossible to even hear this station before using the Gotham beam.*

Extremely high winds are prevalent in this part of Florida. The Gotham beam has withstood blows in excess of 50 miles an hour without failure.

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I have enthusiastically recommended Gotham to all the hams who ask what type I am using (and most of them do, when I tell them the amount of power I'm using). I wish you every success with your product, and feel that it is well worth the modest price.

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(Names and \*call letters upon request.)

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N. Dakota: Fargo Radio Service, 515 Third Ave., North, Fargo.  
Ohio: Mytronic Company, 2145 Florence Ave., Cincinnati.  
Ohio: Selectronic Supplies, Inc., 1320 Madison Ave., Toledo.  
Ohio: Sepco, Inc., 135 E. 2nd St., Dayton.  
Pennsylvania: Radio Electric Service Co., 7th & Arch Sts., Philadelphia.  
S. Dakota: Burghardt Radio Supply, Inc., Watertown, Aberdeen.  
Tennessee: Curle Radio Supply, 439 Broad St., Chattanooga.  
Virginia: Radio Equipment Co., 819 W. 21st St., Norfolk.  
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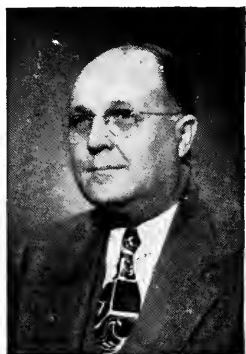
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| <input type="checkbox"/> Deluxe 2-El Gamma match | 31.95  | <input type="checkbox"/> T match 34.95 |
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(Note: Gamma-match beams use 52 or 72 ohm coax.  
T-match beams use 300 ohm line.)

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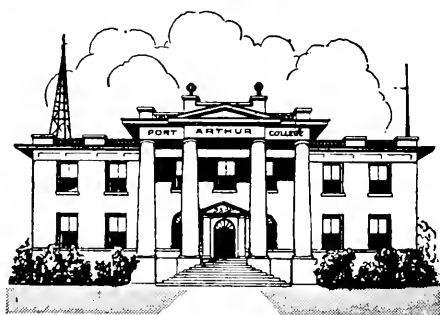
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dropped into Headquarters. With deep regret we record the sudden passing of Bert Knowles, QB. For many years he worked faithfully as QSL Manager for this section. It is regrettable that no one took time to inform us more fully, yet several stations were heard indicating their wish that they be appointed but a few hours after the news broke! To us this is not ham radio. To the incoming QSL Manager, whose appointment comes from Headquarters, we extend best wishes and trust that he will follow the high standard of service to ham radio that Bert set. Traffic: (June) VE3VZ 120, NO 92, BUR 77, DPO 68, KM 40, AUU 37, TO 2, VD 1. (May) VE3DPO 192.

**QUEBEC** — SCM, Gordon A. Lynn, VE2GL — It is with regret that we record the passing of ASW. Dr. Stockwell died very suddenly in the middle of June and the sympathy of the entire VE2 gang is extended to the bereaved. Field Day held the spotlight in activity in June, VE2 being represented by many groups in many parts of the Province. BK operates week ends from his summer QTH at Dunany with 120 watts to a pair of 6146s and has an 813 linear on c.w., a.m., and s.s.b. from the home QTH. XX's new mobile in the new car sounds FB, as does that of WK, who has an Elmac AF67 with 60 watts. BE is enjoying s.s.b. and BG is gradually falling too! Recently-appointed Asst. EC VE2ADD was active with his Amos members in search for a missing man. OB has a new jr. operator. FL has acquired a Mark II which will be at the disposal of all area AREC members as a portable station when needed. EC reports continuing skeds daily at 0830 and 1300 on 3.7 Mc. with KJ, APP, UB, and AOB. ACS is operating from Forestville for the summer. ANK and AUH are fighting for WAS. KG is building a new rig with 829 final for the new car. PQN continues operating on a reduced summer schedule, Mon., Wed., and Fri. at 7:15 p.m. on 3670 kc. Traffic: VE2EC 35, GL 14, FL 10.

**ALBERTA** — SCM, Sydney T. Jones, VE6MJ — PAM: OD. RM: XG. The NARC has lost its president, ZR. Ernie and his XYL have moved to Montreal with CPA. Best wishes from the Edmonton gang, Ernie and Barbara. YD was heard recently on 3.7-Mc. 'phone after a long absence. BI has been bitten by the ham bug again. MJ is considering mobile operation. HM and NX kept in touch with Isachsen and relayed traffic in connection with the mercy flight. NX has made DXCC. VE8MD is visiting with HM before taking off for the north to install another weather station. OS reports two new calls in Lethbridge, MR and UL. WC has made a start on the new 813 final. AL has gremlins in the new rig. Congratulations to PV on his election to membership in the A-1 Operator Club. GD was heard from his mobile while operating in British Columbia. CE and family have returned from a vacation to Vancouver Island. His son Peter is sporting a brand-new call. Traffic: VE6HM 67, NX 55, OD 32, YE 25, WC 16, MJ 6.

**SASKATCHEWAN** — SCM, Harold R. Horn, VE5HR — Sorry, gang, but the SX-96 did not stay with us. 2BG, Canada's oldest licensed ham (1907), was the lucky man. 5AI won the Gus Cox Trophy for c.w. Lorne turned out an FB copy for c.w. MQ is the proud possessor of the furlined button holes for the efforts in the Liars Contest. 3EY, ex-5UO from Ottawa, came the longest distance, with 7QE second. 7QE also was the oldest ham at the hamfest. PT was the youngest. MO was first in finding the hidden transmitter, with TH coming second. TH also put over some FB sports events for the ladies and youngsters. The best mobile was won by LW, with BL second. XX and YY, Keith and June Baker, our newest hams, helped to show that Regina holds some kind of a record for double-letter calls. NN, WW, XX, YY, and ZZ all have Regina as their QTH. 6PE, 4AS, 4GE, and 4RF were other districts represented. To those who came to the hamfest, thanks again and we hope you enjoyed yourselves. To the others, sorry you could not make it but hope to see you at the next one.

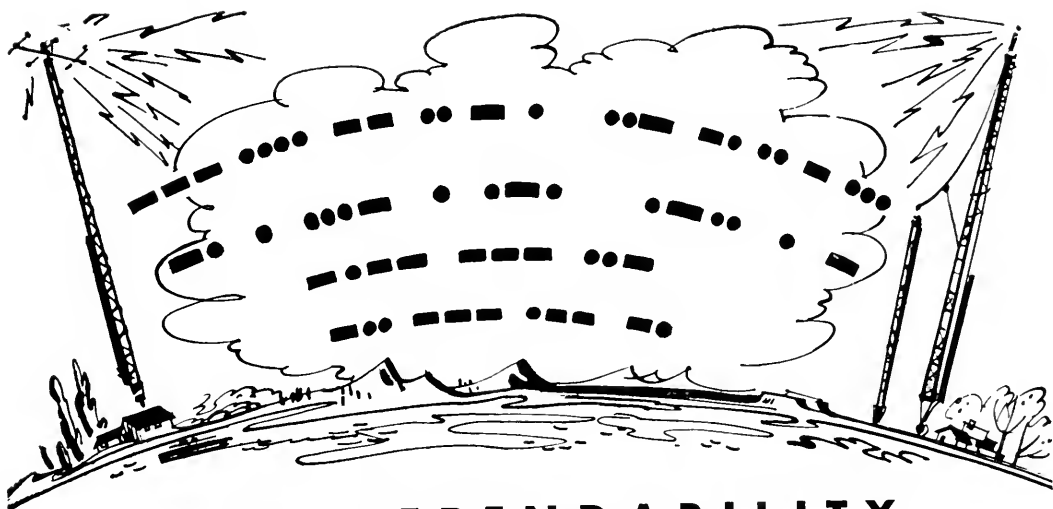
## FEED-BACK

W8MNX informs us that the part number for the modulation transformer in the 50-Mc. rig, described in July *QST*, is A-3008 instead of A-3003.

In the "Four Band S.S.B. VFO," July *QST*, the grid resistor should be 0.1 megohm instead of 0.01 megohm.

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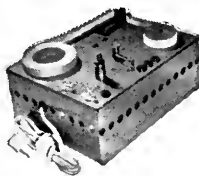
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## Solarized QSO

(Continued from page 11)

CQ-1) amplifier. Although the receiver was usually limited to 'phone reception only, the "rushing" noise of very strong c.w. signals could sometimes be copied. A separate random-length antenna was used for receiving.

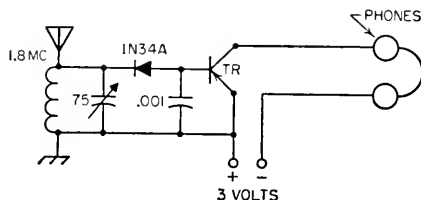


Fig. 3—Transistor receiver using a crystal detector and transistor amplifier.

### Results

A total of four two-way contacts, two 'phone and two c.w., was made with Field Day stations W1ICP/1 and W1DXI/1. Both of these stations reported the solar-powered signals loud and clear. Although the distances involved for these contacts were only a few hundred feet, several miles could probably be worked with proper antennas and good conditions.

## Code-Practice Oscillator

(Continued from page 22)

the peak current, and in conjunction with the 20- $\mu$ f. condenser provides sufficient filtering to give a crystal-like tone. The two resistors in series across the plate supply serve as a bleeder and help to hold the voltage under control when the oscillator section is not operating.

The second triode section of the 12AU7 functions as an oscillator in a Hartley circuit in which the plate is at ground potential for audio, with output taken from the cathode circuit. The voltage drop across the 2000-ohm resistor in the plate-supply section provides the necessary 10 volts to bias the triode to cut-off. Only the bias voltage of 10 volts appears across the key.

The 3-4-ohm voice coil of the usual 2- to 4-inch speaker is connected directly in the cathode return, eliminating the output to voice-coil transformer usually required. A speaker without the output transformer compares in cost with low-cost 'phones, therefore speaker output can be obtained without increased cost. If it is desired to use headphones, they may be connected at the points indicated. Suitable output was obtained using 'phones from 500 ohms up. (If the speaker is omitted, the negative supply lead is connected directly to the bottom of  $L_1$ .)

The heater circuit should not be grounded, because the full plate voltage would appear between the cathode and heater in the rectifier section. With the heater floating, the cathode-to-heater insulation of the two sections is in series, providing sufficient rating for the voltage used.

(Continued on page 112)

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## TILT OVER with GROUND POST

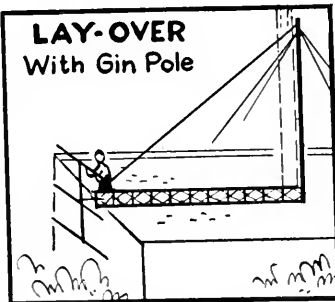
Six types to choose from—40 to 65 ft. Built to support anything from a Mini-Beam to the heaviest. Cranks down and tilts over for quick, easy adjustment. No guy wires needed. Ground post is 3½" steel pipe or larger.

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G PRBD S	60-65.....	\$260
G PRBD X	50-55.....	\$325
G PRBD X	60-65.....	\$385

Three types to choose from—40 to 60 ft. Ideal one-man installation for flat roofs or porches. Cranks up and down and lays over for easy antenna adjustment. No guy wires needed. Tower is locked in a V-bracket at top of gin pole.

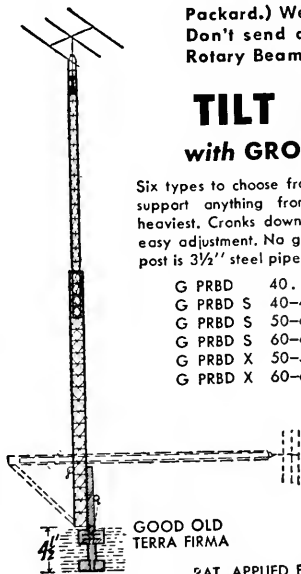
GIN-RBD	40	\$125.00
GIN-RBD	40-45	\$165.00
GIN-RBD	50-60	\$215.00

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Provisions to mount rotor inside top of tower. Bearings at A and B relieve all strain from rotor.



## BUILD IT YOURSELF

Go as high as you like with 20 ft. sections. 320 ft.?



### C-10

Width 10"  
Max. Height  
120 ft.  
Guy Spacing  
27 ft.  
Weight per  
ft. 4½ lbs.  
Price  
(approx.)  
\$2 per ft.



### C-15

Width 14"  
Max. Height  
200 ft.  
Guy Spacing  
40 ft.  
Weight per  
ft. 8 lbs.  
Price  
(approx.)  
\$3.50 per ft.



### C-25

Width 25"  
Max. Height  
320 ft.  
Guy Spacing  
60 ft.  
Weight per  
ft. 20 lbs.  
Price  
(approx.)  
\$9 per ft.

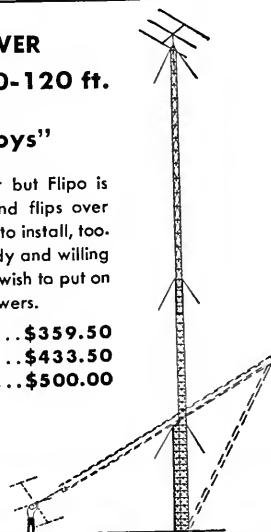
Used extensively for VHF and UHF communication antennas. Two other sizes available. When maximum height and guy spacing are not exceeded, these towers will withstand a 60 lb. wind load.

## FLIP OVER 80-100-120 ft.

"for the high boys"

Gets you up in the air but Flipo is easily cranked down and flips over to adjust antenna. Easy to install, too. A real sturdy brute ready and willing to carry any load you wish to put on it. One of our finest towers.

FOX 80.....	\$359.50
FOX 100.....	\$433.50
FOX 120.....	\$500.00



## WRITE FOR CATALOG

When writing, please specify type of tower in which you are interested, height and expected antenna load. This information is necessary to give you accurate advice.

# E-Z WAY TOWERS INC.

5901 E. BROADWAY  
P. O. BOX 5491

PHONE 4-3916  
TAMPA, FLORIDA

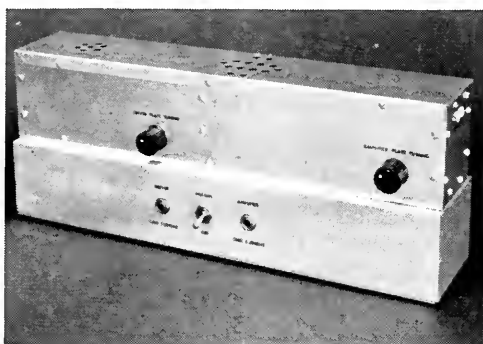


Fig. 17-31 — A tripler-amplifier for 432 Mc. using dual tetrodes. Shielded construction and forced air cooling are employed. . . . This sleek unit is just one of the many pieces of VHF equipment you can build from complete directions in the 1955 Radio Amateur's Handbook. Five chapters on VHF and UHF gear and antennas with dozens of photographs, tables and drawings in the 768-page . . .

## RADIO AMATEUR'S HANDBOOK

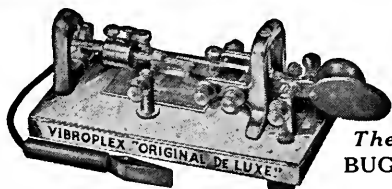
**\$3.00**

\$3.50 U. S. Possessions and Canada, \$4 elsewhere

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West Hartford 7, Connecticut

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BUG**

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New York 3, N. Y.



## Construction

To benefit from the circuit design, the unit should be completely enclosed in a cabinet. A midget speaker case makes a fine enclosure, and can be fitted with a subpanel and, if required, a perforated metal back plate. Alternately, a sloping-front meter case can be easily fitted with a grille at even less cost.

The original unit pictured was constructed in a case which may be recognized as a surplus electric-blanket control. A perforated metal speaker grille replaces the original thermometer-type dial arrangement. The knob on the left is the off-on switch which was an original part. The key jack is located behind the hole on the right. Although these surplus units have been available for a nominal price, few parts, other than the case, are adaptable to this construction.

## Wiring

Wiring is straightforward and no difficulty will be experienced if the socket terminals are checked carefully and the proper polarity of the 20- $\mu$ f. electrolytic filter condenser is observed. Polarity of the coil  $L_1$  is not critical, in event one of another make is used and its leads are coded differently from the one shown (the center-tap must of course be correctly identified). Since the values of  $L_1$  and  $C_2$  determine the tone, any large deviation in  $L_1$  may require a change in the value of  $C_2$ . A simple trial-and-error process will achieve a pleasing tone.

## Civil Defense Package

(Continued from page 29)

slight a.c. hum on the modulation which was cleared up by changing the grounding point of the cathode and screen-grid by-pass condensers of the first audio stage from a ground lug on the power socket to a ground lug near the tube socket.

In tuning up the transmitter, the meter switch should be set to read doubler grid current and the crystal plate should be tuned for maximum reading, which will be around 0.5 ma. The crystal-oscillator plate current will be 5 or 6 ma. Next, tune the doubler for maximum final-amplifier grid current. This should be 3 or 4 ma. with a doubler plate current of about 20 ma. Attach a 10-watt light bulb as a dummy load and tune the final amplifier for maximum brightness of the bulb. The bulb should just perceptibly brighten further with voice modulation. The plate-current dip in the final amplifier should run around 40 to 50 ma., loaded, and the modulator plate current should kick up from a static value of 2.5 ma. to a maximum of 50 to 60 ma.

Measure the bias voltage across the resistor in the center tap of the power supply and adjust the slider for 22 volts bias. The slider should be set at 166 ohms. Make the adjustment with the transmitter on, as it takes the full current in the transmit position to cause the 22-volt drop across the resistor. The voltage will be less during re-

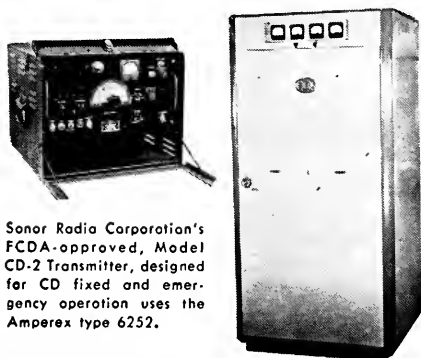
(Continued on page 114)

# WHILE NEW YORK CITY SLEEPS Amperex® VHF TUBES STAND GUARD

... and over 70,000 Amperex 5894 or 6252 VHF transmitting tubes are now in use all over the country, in approved equipment by Fire Departments, Civil Defense, Police and other Municipal Emergency Services...

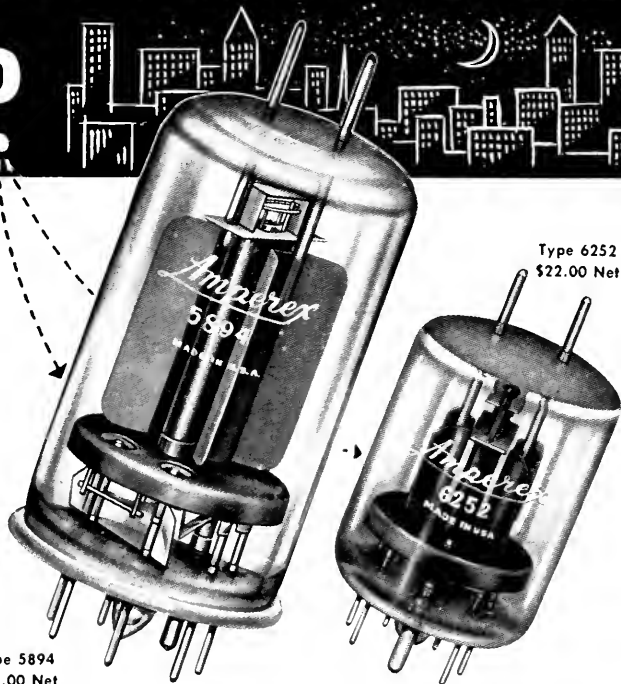
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Amperex TUBES  
have proven  
MOST DEPENDABLE**

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Sonor Radio Corporation's FCDA-approved, Model CD-2 Transmitter, designed for CD fixed and emergency operation uses the Amperex type 6252.

Radio Engineering Laboratories' Type 715 Transmitter, used by New York City's Fire Department, employs the Amperex type 5894.



## COMPARISON PROVES AMPEREX SUPERIORITY

Maximum Plate Input & Voltage V5 Frequency  
(Push-pull, Class C Operation)

Service ICAS	Frequency Band (Mc)	AMPEREX 6252		Nearest Rated Competitive Tube	
		Plate Input Watts	Plate Volts	Plate input Watts	Plate Volts
Plate	144-148	72	600	49	435
Modulated	220-225	72	600	44	370
Telephony	420-450	51.5	475	31	300

The AMPEREX 6252 ICAS higher voltage and input ratings show the advantage of the independently suspended anode construction which eliminates the need for internal insulation. Competitive tubes use mica insulators between the plate and the rest of the internal structure, resulting in low maximum anode voltage and greater derating at higher frequencies.

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This outstanding transmitter has been acclaimed a great performer throughout the world. Air wound plug-in coils used for high efficiency. Takes any freq. from 1.6 to 30 mc. Ideal for General Class, Novice, CAP, CD, Industrial. Sold direct from our factory, ready to operate. 40 to 50 watts input. Phone-CW. Complete with 8 x 14 x 8 cabinet, 40 meter coils, xtal, tubes: 6V6 osc., 807 final, 5U4G rect., 6SJ7 xtal mike amp., 6N7 phase inv., 2-6L6's PP mod. Wt. 30 lbs. \$79.95. 80, 20, 10 meter coils \$2.91 per band. 160 meter coils \$3.60.

**MODEL 130 FOR 120 TO 130 WATTS—\$199.50**  
807 osc., 2-807's final, 6N7 xtal mike amp., 807 AF driver, 2-807's mod., 2-866A's rect., 6L6 clamper. Wt. only 47 lbs.

**MODEL 242 FOR 2 METERS—45 WATTS INPUT—6146 FINAL.** Complete with mobile connections, A.C. power supply, tubes, xtal. Xtal mike input. Uses 8 mc. xtals. Swinging link matches 52—300 ohm antennas. Same cab. as 240. \$89.95. Also 6 meter model.

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## LETTINE RADIO MFG. CO.

62 Berkeley St.

Valley Stream, N. Y.

ceiving, but the bias is not used during reception.

For dependable service, which is necessary in c.d. work, all components should be used well within their ratings. This applies to tubes as well as resistors and condensers. A stock of spare tubes and parts should be kept with the equipment in case of failure at a critical time.

## Results

In actual use on the air in c.d. drills, this little peanut whistle has performed very well. The receiver also performs well, and although it is not selective enough for regular amateur use (it could be made so) it is ideal for c.d. work. No retuning is necessary for different net stations even though their crystals are 1 or 2 kilocycles high or low.

Installed as a mobile, other mobiles have been worked at distances up to 30 miles during c.d. drills.

Last but not least, there is no TVI from harmonics when a good low-pass filter is used (this is a must), even though the TV set is in the same room. However, it may be necessary to install a few high-pass filters on some near-by TV sets to prevent fundamental overload, even with the low power.

## W/VE Contest

(Continued from page 58)

contact; (2) your call; (3) RST report given; (4) ARRL section. Example: NR 1 W0ZZZ 579 Kansas.

4) One point may be counted for each exchange sent and acknowledged. One point may be counted for each exchange received. For contest credit a station may be worked once on 'phone and once on c.w. on each band. VE/VO stations will multiply the total points by the number of U.S.A. ARRL sections worked. W/K stations will multiply the total points by the number of VE areas worked and also by 7.11, there being nine Canadian areas (VE1 through 8 plus VO).

A station using a power input of 30 watts or less will receive an additional multiplier of 2, and a station using from 30 watts to 100 watts will receive one of 1.5. The final score consists of "total points" multiplied by "sections" (times 7.11 in case of W/K stations) multiplied by the "power multiplier."

5) Each entry must be accompanied by the following declaration: "I hereby state that my station was operated strictly in accordance with the rules of the contest and governmental radio regulations, and I agree that the decision of the Contest Committee of the Montreal Amateur Radio Club, Inc., shall be final in all cases of dispute."

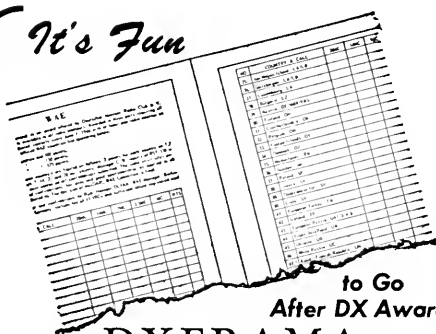
6) All entries shall be sent to Gordy Webster, VE2BB, 69 Pine Beach, Dorval, Quebec, Canada, and must be postmarked not later than midnight October 15, 1955.

## & Strays

During a practice alert, messages poured into Pinedale, Calif., civil defense headquarters. The texts of these messages were concerned with evacuation, radioactive fall-out, etc. Operators were stunned though when they received this one: "Waiting since 5:30, stop. Dinner cold, stop. Drop dead, end." It was sent by the wife of a Fresno ham!

— KN6LEY

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Collins KWS-1.....**1995.00**  
Collins 32V3.....**775.00**  
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Ranger wired.....**293.00**  
Viking II kit.....**279.50**  
Viking II wired.....**337.00**  
VFO kit.....**45.50**  
VFO wired.....**62.50**  
Adventurer kit.....**49.85**  
Matchbox.....**1595.00**  
KW amplifier.....**49.50**  
RMD D8-23.....**49.50**  
B&W 5100S.....**467.50**

B&W 51SB.....**\$279.50**  
Central 10B.....**129.50**  
Central 20A.....**199.50**  
Central 600L.....**349.50**  
Elmac PMR 6 or 12.....**134.50**  
Elmac AF-67.....**177.00**  
Morrow 5BR1.....**73.45**  
Morrow 5BRF.....**66.59**  
Morrow FTR.....**125.83**  
Gonset Super 6.....**52.50**  
Gonset Commander.....**124.50**  
Gonset Communi-  
cator.....**229.50**  
Palco Bantam 6S.....**159.50**

HQ140X.....**\$264.50**  
PRO-310.....**595.00**  
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Hallicrafters S85.....**119.95**  
Hallicrafters SX99.....**149.95**  
Hallicrafters SX96.....**249.95**  
National SW54.....**49.95**  
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MEMBERS of the League in eight ARRL Divisions will soon be nominating and voting for the directors who will represent them for the next two years. Every amateur taking part in these elections helps further the aims and protects the privileges he has as a ham. Naturally, only League members vote in ARRL elections. Let your voice be heard—sign up now.

**QST and ARRL Membership**  
**\$4 in the USA \$4.25 in Canada**  
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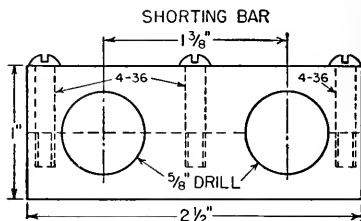
**The American Radio Relay League, Inc.**  
**West Hartford 7, Conn.**

## 144-Mc. Amplifier

(Continued from page 32)

condition, the final grid current peaks at the same tuning setting as that for minimum plate current.

The amplifier is operated at 2000 volts on the plates, at 250 ma. Modulation is supplied by a



REAR SUPPORT FOR PLATE LINES  
(2 REQUIRED)

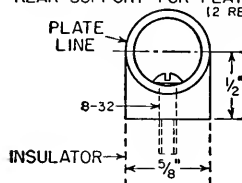


PLATE LINE SUPPORTS AT TANK CONDENSER  
(2 REQUIRED)

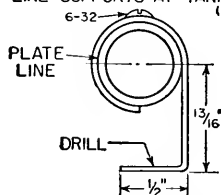
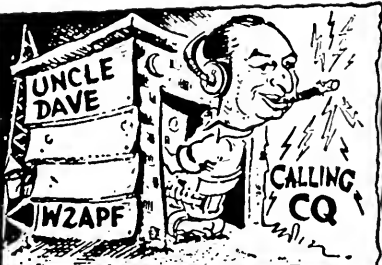


Fig. 3—Plate line accessories for the 2-meter amplifier. The shorting bar is made from a single piece of  $\frac{3}{16}$ -inch brass. It is sawed along the dotted line after the holes are drilled. Screw holes in upper portion clear 4-36 screws. Lower portion is tapped. Rear supports for line can be made from a single  $1 \times \frac{5}{8}$ -inch piece of brass if proper drilling tools are available, or they can be made from  $1 \times \frac{3}{4}$ -inch stock and then cut at center with hacksaw. Contacts for the tuning capacitor are made from  $\frac{1}{2} \times \frac{1}{16}$ -inch soft copper bus, formed around line with a soft hammer. All parts silver plated after completion.

pair of 811-As running at zero bias, having an output capability of around 300 watts. Checks have been made with the aid of an audio oscillator and an oscilloscope, and the amplifier operates very stably at 100 per cent modulation, either sine wave or voice, and the 'scope pattern shows good linearity in the modulated stage.

**Strays**

A QST sub (no pun) has been entered for the Commanding Officer of the USS Nautilus. QST rides deep!



# FORT ORANGE

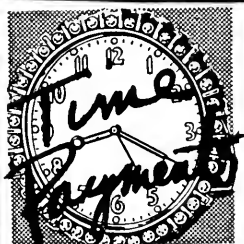
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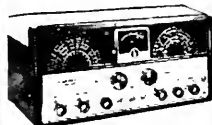
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Johnson Viking Mobile with VFO.....	135.00
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R46B Spkr for SX96, SX99 .....	19.95

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B & W	
5100 Xmtr .....	\$442.50
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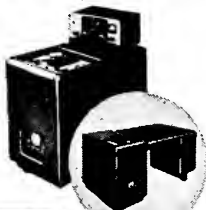
Model 3025	\$229.50
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2 meters	
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60 Watt 2 Meter  
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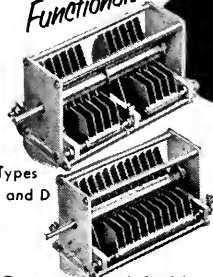


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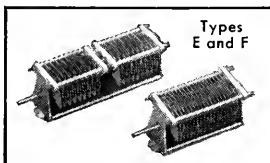
Designing and building your own gear? Compact Johnson transmitting capacitors provide more capacity per cubic inch. Mounting brackets furnished for normal or inverted mounting—shafts extend both front and rear for design flexibility. Available in single and dual types.

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**TYPE C and D**—For high voltage—high power applications. Maximum capacities from 50 to 500 mmfd. Breakdown ratings from 3,500 to 11,000 volts. Steatite insulators, aluminum end frames, 1/4" cadmium plated shafts. Panel space required: Type C, 5 1/2" wide x 5 3/8" high; Type D, 4 1/4" wide x 4" high.

**TYPE E and F**—For medium and low power transmitters. Maximum capacities from 35 to 500 mmfd. Breakdown ratings from 2,000 to 4,500 volts. Aluminum plates .032" thick, aluminum end frames and tie rods. Steatite insulators, rotor contacts are cadmium plated phosphor bronze. Panel space required: Type E, 2 3/8" square; Type F, 2" x 2 1/8".



Types  
E and F

**E. F. JOHNSON COMPANY**

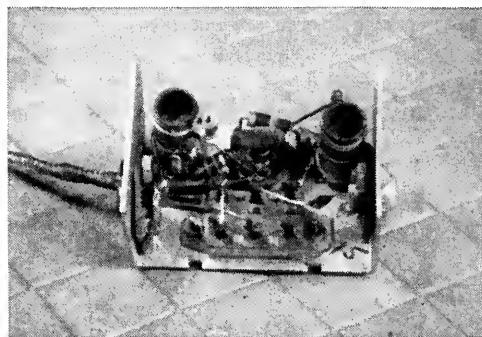
2833 SECOND AVENUE S.W. • WASECA, MINNESOTA

## Preamplifiers

(Continued from page 36)

quency with a grid-dip meter. The tube should be inserted during this check and the slide switch placed in the "in" position.

With the preamplifier connected to the antenna and receiver, apply voltages, place the slide switch to the "out" position, and tune in a signal on the receiver. A grid-dip meter makes a good



Bottom view of the miniature preamplifier.

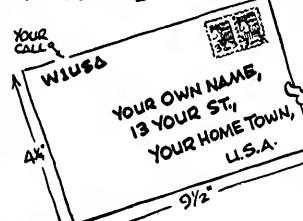
signal source for this alignment. Place the slide switch to the "in" position and adjust the slugs for maximum reading on the S-meter. If the receiver does not have an S-meter, the preamplifier can be adjusted for maximum signal or noise while listening to the audio output of the receiver with a pair of headphones (this eliminates outside noises). If the receiver has an S-meter, it should show an increase of 4 to 6 S-units when switching the preamplifier in. Coils have not been included for 80 and 40 meters, since most receivers operate satisfactorily at the lower frequencies and a preamplifier is not normally required.

COIL TABLE

Band	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	C <sub>A</sub>
10	3 t.	20 t.	24 t.	3 t.	none
15	3 t.	27 t.	32 t.	3 t.	none
20	4 t.	27 t.	32 t.	4 t.	20 μf.

All wound with No. 30 enam. on CTC LS 3 3/8-inch iron-slug forms.

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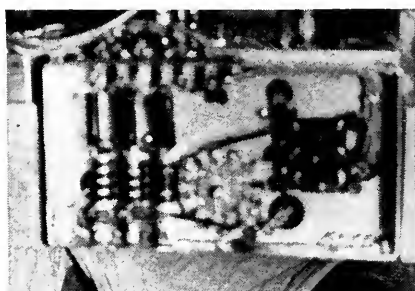
A complete resume available  
on request to CD Division —  
**SONAR RADIO CORP**  
3050 WEST 21st ST., B'KLYN, N. Y.

## Bandswitching Rig

(Continued from page 41)

meter stage is too small.  $C_6$  should then be set at *less* capacitance than originally, the VFO reset to 4000 kc., and the slug in  $L_2$  readjusted for maximum grid current. If the readjustment for maximum grid current at 3200 kc. has required a *decrease* in the capacitance of  $C_6$ , the tuning range of the 80-meter stage is too great. In this case,  $C_6$  should be set initially at a *higher* capacitance at 4000 kc.

When an adjustment has been secured where the grid current remains essentially constant across the 80-meter band, the bandswitch should be turned to the 40-meter position. The VFO should be set to the low-frequency end of the band, and a high-resistance voltmeter connected



The v.h.f. filter components are enclosed in an extension added at the rear of the exciter chassis. The switch section is  $S_{2g}$ .

across the 40-meter doubler grid leak.  $C_7$  should then be adjusted for maximum voltage. This voltage should remain essentially constant over the band.

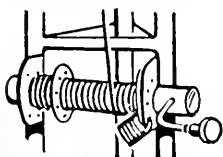
The 40-meter stage, as well as the following multiplier stages, are lined up by the same method used for the 80-meter stage. The band-set condenser is set at midrange in each case, the VFO is tuned to the high-frequency end of the band, the slug in the plate inductor is adjusted for maximum 807 grid current, and then a check made at the low-frequency end of the band, repeating the process if there is a conspicuous difference in grid current at the ends of the bands. On 21 Mc., it should be necessary to adjust only the slug of  $L_5$  after the circuit has been lined up on 14 Mc.

If parasitic oscillation occurs in the final amplifier when plate and screen voltages are applied,  $L_7$ ,  $L_8$ , and  $L_9$  should be adjusted, a turn at a time, until the parasitic is suppressed. In the multiband tuner, it is advisable to adjust  $L_{11}$  carefully so that 14 Mc. comes at maximum capacitance of  $C_{15}$ , and adjust  $L_{10}$  so that 7.3 Mc. comes with the capacitor near minimum capacitance. This procedure should result in maximum separation between fundamental and harmonic resonances.

After the steps described earlier were taken, no sign of instability could be found on any

(Continued on page 122)

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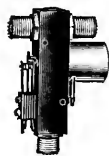
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band with the rig running wide open, regardless of the setting of the tuning or excitation controls. After a high-pass filter had been installed at the input of the TV receiver to prevent overloading, no TVI could be detected on a receiver running in the same room, with a separation between antennas of only 10 feet. The rig can be flipped from band to band with no fussy adjustments and with complete freedom from "bugs" of any kind. Reports on the quality of signal have been universally excellent.

## World Above 50 Mc.

(Continued from page 62)

uled for the contest week end, September 17th and 18th. K4AMX will be operating from Mt. Mitchell, N. C. (highest point in eastern U.S.A.), on 50, 144 and possibly 220 Mc. Frequency on 2 will be 144.23, with 16-element horizontal array.

An International 2-Meter Relay is planned for the contest week end by the 2-Meter and Down Club of Los Angeles. Stations will be manned at various California high spots from the Mexican border north, but coöperation of W7s will be needed to complete the route to Canada. The northern terminal will probably be VE7FJ, in the Vancouver area.

The third-party traffic angle has been taken into consideration (we have an agreement with Canada, but not with Mexico) and if no special dispensation can be arranged for the occasion, the work from the Mexican end will be handled in such a way as to conform completely with our international obligations in such matters.

OES gang: Due to long copy this month we're holding back OES notes. Will combine two months in next issue. Reports are getting better all the time. Keep 'em coming!

## June V.H.F. Party

(Continued from page 57)

W2MHE/2 <sup>2</sup> (W2s AMV MHE YGA) .. 1044-86-12-BD	W2MLX/2 .. 2214-110-18-ABC
W2SFV/2 (W2s OV SFV) .. 392-49-8-B	W2DZA .. 1536-80-16-ABCD
W2DMF/2 (16 oprs.) .. 231-3-7-B	K2BJP .. 900-100-6-B
N. Y. C.-L. I.	K2CCF .. 600-100-6-B
W2FHI .. 3762-171-22-AB	K2HNA .. 560-70-8-B
W2KRE .. 1794-138-13-B	K2ICE .. 560-80-7-B
W2BRV .. 1524-127-12-B	KN2MLB .. 468-78-6-B
K2BWV .. 1206-134-9-B	W2WCM .. 315-45-7-AB
W2AOD .. 846-91-9-BD	W2BYM .. 297-33-9-A
W2LID .. 791-113-7-B	K2GLI .. 128-32-4-A
W2YHP .. 784-112-7-B	W2ESC .. 115-23-5-B
W2DLO .. 744-61-12-ABC	W2OHJ .. 60-20-3-A
K2ATL .. 450-75-6-B	W2TTM (Raritan Bay R. Amateurs) .. 2737-161-17-AB
W2JBQ .. 378-54-7-B	
W2BOY .. 352-88-4-B	
W2QQD/2 .. 333-37-9-B	
W2EEN .. 315-45-7-AB	
W2BNX/2 .. 196-49-4-B	
W2WOK .. 189-17-1-17BCD	
KN2KTT .. 180-45-4-B	
W2IN .. 130-26-5-B	
KN2MPC .. 104-26-4-B	
K2AZT .. 102-17-6-A	
W2VKP .. 75-25-3-B	
W2TUK .. 60-30-2-B	
K2IEJ/2 <sup>2</sup> (W2JZT, K2s DEO IEJ) .. 1807-139-13-B	
W2HNI (W2s HNI 1VU, K2DVX) .. 1500-150-10-B	
W2GLO (Levittown A.R.C.) .. 425-83-5-ABD	
W2JU/2 (7 oprs.) .. 420-105-4-B	

## MIDWEST DIVISION

Iowa	
W0GUD .. 198-33-6-B	
W0YHP .. 60-15-4-B	
W0USQ .. 24-8-3-A	
KN0BAN .. 12-6-2-B	
Kansas	
W0GLN .. 128-32-4-B	
W0HJ .. 104-26-4-B	
W0IFR .. 56-14-4-B	
W0MVG .. 55-11-5-AB	
W0MOX/0 .. 27-9-3-B	
Missouri	
W0LOM .. 48-12-4-B	
Nebraska	
W0HXX .. 40-10-4-B	

## NEW ENGLAND DIVISION

Connecticut	
W1HQD <sup>3</sup> .. 3198-116-26-ABCD	
W1RJA .. 2646-189-14-B	

(Continued on page 124)

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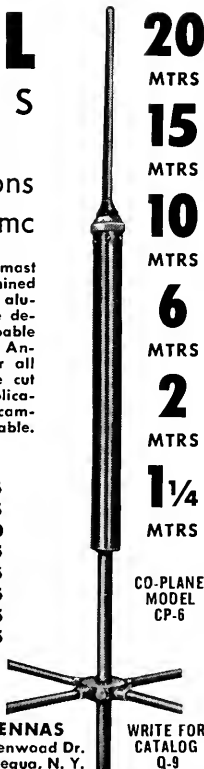
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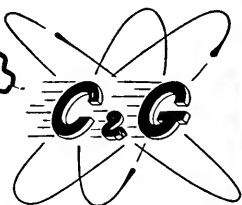
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WIIAHE... 639-71-9-B  
WIIZEN... 630-70-9-AB  
WIIZGO... 568-71-8-B  
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WIIIDU... 114-38-3-B  
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WIIISR... 72-22-2-B  
WIIYIZ/M 34-17-2-B  
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WIIAFO... 212-53-4-B  
WNIICPC 168-42-4-B  
WNIICJT 108-54-2-B  
WNIIEYH 94-4-2-A  
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K2BKU/1 (K2BKU, W2MJT)  
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WIIINGW 520-65-1-AB

WIIINX... 392-56-7-AB  
WIIIBH... 378-52-7-ABCD  
WIIOEN... 90-2-2-B  
WIIWGP... 62-31-2-B  
WIIIRGS/XI 24-12-2-A  
WIIIOAY/7 (WIs ERA JIP  
OAY)... 1703-129-13-ABD  
WIIOTV/7 (Tualatin Valley  
E.R.C.) 540-88-6-ABD

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WIIISFO... 500-49-10-ABD  
WNI7WSP/WIIWSP  
480-60-8-AB  
WII7TMU... 216-27-8-A  
WII7YJE... 189-27-7-B  
WII7LH... 160-60-3-B  
WII7UZB... 150-52-3-B  
WII7KO... 148-37-4-AB  
WII7PUA/7 126-42-3-B  
WII7SRL... 120-40-3-B  
WII7PQS... 102-17-6-A  
WII7KPE... 84-58-3-B  
WII7TBS... 26-2-2-B  
WNI7ZTW 12-12-1-B  
WII7RAP/72 (WIs IEE NAT  
RAP)... 504-84-6-AB  
WII7UVH/7 (4 ops.)  
268-67-4-AB  
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WII6ZBS/M 135-27-5-B

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774-129-6-B

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WII6FYX... 9-3-3-B

### Sacramento Valley

KN6KDU 468-78-6-B  
WII6PIN/6 464-58-8-AB  
WII6MLN... 259-37-7-AB

### San Joaquin Valley

WII6GQZ... 473-43-11-AB

## ROANOKE DIVISION

### North Carolina

WII4CVO... 259-37-7-AB  
WII4NHW 12-42-3-B  
WII4BUZ... 120-40-3-B  
WII4SOP... 102-34-3-B  
KII4AMX... 84-21-4-AB  
WII4ACY... 80-40-2-B  
WII4YSB... 78-26-3-B  
KII4BYX 50-25-2-B  
WII4ZNL... 46-23-2-B  
WII4CPI... 32-16-2-B  
WII4VHI... 30-15-2-B  
WII4MDA... 24-12-2-B  
WII4HHO... 18-18-1-B  
WII4GNF... 9-9-1-B

### South Carolina

WII4CPZ... 22-11-2-B

### Virginia

WII4CJ... 1008-84-12-AB  
KII4BLC 255-61-5-B  
WII4VVE... 126-21-6-B  
WII4UCH... 70-14-5-A  
WII4VQZ... 63-21-3-B  
KII4AT... 51-17-3-B  
KII4CQZ 27-9-3-B  
WNI4HXB/4 (WNI4HXB, WIs  
VAD WSP)  
200-50-4-B  
KII2DCF/4 (KIs CJK DCF)  
170-34-5-B  
WII4TNQ (WII4TNQ, KN4BBR)  
112-28-4-B

### West Virginia

WII4SEP... 15-5-3-B  
WII4EXZ/8 (5 ops.)  
1846-137-13-ABCD  
WII4PGA/8 (7 ops.)  
1428-81-17-ABCD

(Continued on page 126)

# HARVEY PRESENTS CENTRAL ELECTRONICS EQUIPMENT for AM, CW and SSB



## NEW BROAD-BAND Linear RF Amplifier Model 600L

The 600L has no tuning controls except a single knob selector covering all amateur bands from 10 through 160 meters. Requires only 2 watts effective or 4 watts peak envelope drive power for 500 watts dc input. New band-pass couplers provide 60 to 65% linear efficiency. Uses single 813, class AB<sub>2</sub> and has automatic relay to protect 813 and RF couplers.

New meter features include: reads input power directly in watts... reads grid current... reads output in RF amperes... shows reflected power due to mismatched load... input level calibrations for AM, PM and CW. Function selector knob switches meter to any reading while transmitting.

Has built-in power supply with excellent regulation of bias and screen voltages. The 600L is effectively TVI-suppressed with thoroughly shielded and bypassed RF compartments.

Available in either table or rack model.

Complete (factory-wired).....\$349.50

## New MULTIPHASE 'Q' MULTIPLIERS

A tunable IF electronic filter that provides tremendous receiver selectivity for peaking or rejecting signals on AM, CW or SSB. Employs new 2-tube circuit with high-Q inductor. Continuously variable from 60 cps to normal IF pass-band. Interfering carriers attenuated up to 50 db.



AQ



DQ

**Model AQ** — Designed for installation in Model A Slicer. Includes new front panel. Power-IF cable plugs into accessory socket.

Kit.....\$22.50  
Wired.....29.50

**Model DQ** — Designed for use with any receiver with 450 to 500 kc IF. Has power-IF connecting cable. Power requirements are 225-300 vdc at 12 ma and 6.3v at .6 amps. Can provide additional selectivity and BFO for mobile SSB or CW reception.

Kit.....\$22.50  
Wired.....29.50

## SIDE BAND SLICER Model A



Permits selectable SSB reception on any receiver with 450-500 kc IF. Cuts QRM and reduces interference from 15 kc TV harmonics. Has built-in power supply.

Kit.....\$49.50  
Wired.....74.50

**AP-1 ADAPTER** — Plug-in IF stage for use with Slicer. Allows receiver to be switched from SSB to normal.

Wired.....\$8.50

**AP-2 ADAPTER** — Combines AP-1 and crystal-mixer for use with receiver having 50, 85, 100, 915 kc or other IF systems.

Wired.....\$17.50

## SIDE BAND SLICER — Model B

Complete Sideband Slicer same as Model A, but including built-in 'Q' Multiplier. Does not require AP-1 Adapter.

Kit.....\$69.50  
Wired.....99.50

**Harvey Ships Everywhere  
in the World!**



## Model 20A MULTIPHASE EXCITER

20 watts peak envelope output on AM, PM, CW, and SSB. Has single switch for side-band selection... VOX on AM, PM and SSB, plus break-in operation on CW... bandswitching, 160 through 10 meters... magic eye indicator for carrier null and peak modulation... plus many other features. Choice of table or rack model.

Kit.....\$199.50  
Wired.....249.50

## Model 10B MULTIPHASE EXCITER

10 watts peak envelope output—AM, PM, CW and SSB. Uses plug-in coils. Improved version of earlier 10A.

Kit.....\$129.50  
Wired.....179.50

**Write for HARVEY's  
1955  
HAM CATALOG  
IT'S FREE!**

## Model QT-1 ANTI-TRIP UNIT

All-electronic VOX break-in anti-trip unit for use with loudspeaker. Prevents loud signals, heterodynes, etc. from tripping voice break-in. Plugs into socket of 20A or 10B Exciter.

Wired.....\$12.50

## 458 CONVERSION KIT

Basic 458 conversion parts kit, 15 to 160 meters with dial, etc.

Kit.....\$15.00

**Case and Panel Kit** for 458 conversion.....\$10.00

## New — For 10 Meters Model 458-10

Crystal-controlled converter package to extend 458 VFO into 10-meter band. For use with 458 Conversion Kit.

Kit.....\$27.50  
Wired.....37.50

**New HARVEY  
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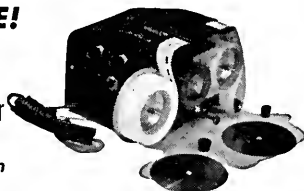
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Type S

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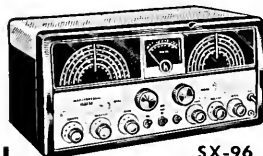
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Kc.—34 Mc. in 3 bands.  
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"S" meter. Phone jack.

Ham net...\$249.95

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DIVISION**

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Utah

W7QDJ... 2- 2- 1-B

**SOUTHEASTERN  
DIVISION**

Eastern Florida

W4AYV... 70- 14- 5-A

Georgia

W4FWH... 90- 15- 6-AB

W4LNG... 44- 11- 4-AB

W4GIS... 39- 13- 3-B

W4IKK... 9- 3- 3-A

**SOUTHWESTERN  
DIVISION**

Los Angeles

KN6HPZ... 126- 63- 2-B

W6BWG... 48- 12- 4-A

W6VTX/6 (San Bernardino Mi-  
crowave Soc.)

6165-400-15-AB/CD E

W6SDW/6 (9 opers.)

1780-177-10-ABD

Arizona

W7LEE... 28- 7- 4-B

San Diego

W6ZOP/6... 378- 63- 6-A

K6COE... 110- 22- 5-A

KN6HMS... 51- 17- 3-B

Santa Barbara

W6QKI/6 (5 opers.)

1768-103-17-ABC

**WEST GULF DIVISION**

Northern Texas

W5SFW... 171- 19- 9-A

Oklahoma

W5PZ... 12- 6- 2-B

Southern Texas

W5FYW... 90- 15- 6-A

WN5HFF/W5HFF

36- 9- 4-AB

New Mexico

W5KWP... 126- 18- 7-A

W5LFH... 75- 15- 5-AB

W5CA... 4- 4- 1-B

**CANADIAN DIVISION**

Ontario

VE3BQN... 791-112- 7-ABC

VE3AIB... 749-107- 7-AB

VE3DNX... 656- 82- 8-AB

VE3DIR... 560- 80- 7-B

VE3BGI... 498- 83- 6-AB

VE3AGW... 450- 75- 6-AB

VE3DSU... 282- 47- 6-B

VE3AET... 260- 52- 5-AB

VE3BNU... 184- 46- 4-B

VE3BBX... 132- 33- 4-AB

VE3AQQ... 114- 38- 3-B

VE3DNP... 105- 35- 3-AB

VE3BOW... 102- 34- 3-AB

VE3NN... 44- 22- 2-B

VE3BMB... 10- 5- 2-A

British Columbia

VE7ASM/7

261- 29- 9-B

VE7AOG... 2- 2- 1-B

<sup>1</sup> Novice award winner. <sup>2</sup> Multioperator award winner. <sup>3</sup> Hq. Staff, not eligible for award. <sup>4</sup> W1QIS, opr.

**On the TVI Front**

(Continued from page 54)

**Oregon:** Astoria, Bend (2), Coos Bay, Eugene, Medford, Newberg, Pendleton, Portland (2), Roseburg (2), Salem, St. Helens.

**Pennsylvania:** Allentown, Altoona, Belle Vernon, Bellevue, Bethlehem, Boyertown, Bucks County (East & West Sections), Chalfont, Delaware County, Dubois, Easton, Glenside, Greenburg, Harrisburg, Havertown, Kingston, Lahaska, Lebanon, Lewisburg, Lock Haven, McKeesport, Meyerstown, New Brighton, Norristown, North Hills, Oil City, Philadelphia (5), Pittsburgh, Reading, Scranton, Selinsgrove, Sharon, Solesburg, Wilkes Barre, York.

**Puerto Rico:** San Juan.

**Rhode Island:** None.

**South Carolina:** Charleston, Columbia, Florence, Georgetown.

**South Dakota:** Mitchell, Rapid City, Sioux Falls.

**Tennessee:** Bristol, Chattanooga, Humboldt, Jackson, Knoxville, Memphis, Nashville, Oak Ridge.

**Texas:** Beaumont, Brownsville, Corpus Christi, Dallas, Deepwater, El Paso, Ft. Worth, Galveston, Houston, Kermit, Lubbock, Midland, Odessa, Orange, Pasadena, Port Arthur, San Antonio, Snyder, Texas City, Woodsboro.

**Utah:** Ogden, Provo, Salt Lake City.

**Vermont:** Burlington, Middlebury.

**Virginia:** Fredericksburg, Hopewell, Newport News, Norfolk, Petersburg (2), Radford, Richmond, Roanoke, Staunton, Winchester.

**Washington:** Bellingham, Bremerton, Chehalis, Ellensburg, Ephrata, Everett, Kennewick, Longview, Pasco, Richland, Seattle, Spokane (2), Sunnyside, Tacoma, Vancouver, Walla Walla (2), Yakima.

**West Virginia:** Dunbar, Fairmont, Huntington, Morgantown, Nitro, Parkersburg, St. Albans, Weston.

**Wisconsin:** Eau Claire, Fond Du Lac, Green Bay, Kenosha, La Crosse, Madison, Marinette, Milwaukee, Neenah, Oshkosh, Port Edwards, Racine, Wausau.

**Wyoming:** Casper, Cheyenne, Gillette, Powell, Sheridan.

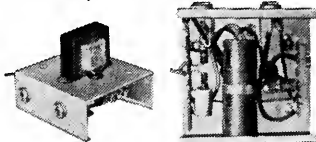
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W0GFR

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## WRL's NEW Economy Code Oscillator Kit



Top-Side and Bottom View, Wired  
Build this low-cost, code oscillator!  
Helps you learn code faster; prepare  
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cluded. Then plug into any 110 volt AC  
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you're ready to go.

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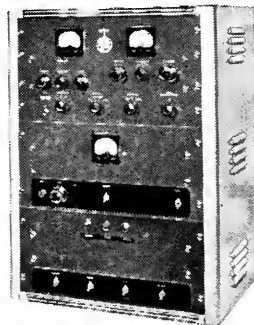
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Phone Plugs (1A025) .33  
Order by catalog number

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### Completely Bandswitching 500-A GLOBE KING

Here's an advanced design, high power transmitter of 500 watts input on both CW and fone 100% modulated. Is completely bandswitching 10 thru 160M. bands. Consists of RF, Speech Modulator and Dual Power Supply Sections. Entire unit is specially screened for TVI. Pi Network output matches any antenna from 52-600 ohms. Has provisions for VFO and Single Sideband input. Forced air-cooled 4-250A tube, push-to-talk, special aluminum mesh screening of RF Section — just a few of the many fine features. Enclosed in grey hammertone cabinet, 31"x 21 1/4"x15".



**ONLY \$367<sup>8</sup>** per mo.

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WRL's new line of sturdy "Plumber's Delight" beams. 1 1/4" hot dipped galvanized steel boom; all elements aluminum; 1 1/2" center pieces; 1" end inserts. Wooden dowelled at all stress points. 20M beam has double 1 1/4" hot dipped galvanized steel booms for extra sturdiness. Specify choice of T or Gamma Match. All beams three element.

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This excellent Xmtr. offers 65 watts input on CW, 50 watts on fone. Is completely bandswitching 10 thru 160M. Combination Pi Network antenna tuner. 100% modulation of Final. Housed in 8" x 16" x 8" grey cabinet.

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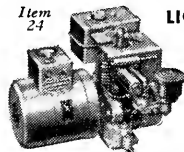
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## MASTER MECHANIC PORTABLE LIGHT PLANTS, PUSH BUTTON START



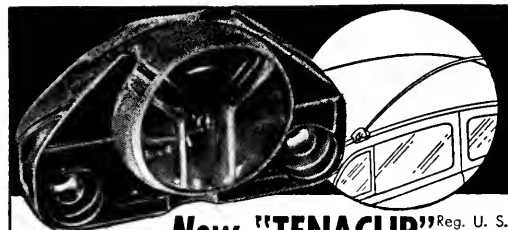
Item 24. Wt. 75 lbs. Be prepared if war or storms  
knockout powerlines. . . . . **\$143.50**  
700-800 Watt Plant (Item 44) same as above but  
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**New "TENACLIP"** Reg. U. S.  
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attaches to car . . . stops antenna whipping

Clear plastic clip quickly fastens to rain mold-  
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PLASTICLCS, 4207 GRAND RIVER, DETROIT 8, MICH.

**\$1.98**

postpaid

## Happenings

(Continued from page 47)

limits of 800-900 cycles. No major difficulty  
having been disclosed by a preliminary examina-  
tion, the petition has now been filed as follows:

### FEDERAL COMMUNICATIONS COMMISSION

Petition for amendment of Paragraphs 12. 107(c)  
and (d) of the Rules Governing Amateur Radio  
Service, titled "Special Provisions Regarding Ra-  
dio Teleprinter Transmissions."

#### Petition of the American Radio Relay League, Inc.

The American Radio Relay League files this petition on  
behalf of the more than 47,000 U. S.-licensed amateur  
radio operators who are members of the League.

This petition was formulated pursuant to instructions  
of the Board of Directors of the League.

The League proposes that the present restriction on fre-  
quency-shift keying in the amateur service, now 800 to 900  
cycles shift, be removed and that instead there be permitted  
any shift under 900 cycles. Specifically, the League proposes  
that Section 12. 107(c) of the amateur rules be amended  
to read as follows:

(c) When frequency-shift keying (type F-1 emission)  
is utilized, the deviation in frequency from the mark  
signal to the space signal, or from the space signal to the  
mark signal, shall be less than 900 cycles per second.

and in consonance therewith, that Section 12. 107(d) be  
amended to read as follows:

(d) When audio-frequency-shift keying (type A-2 or  
type F-2 emission) is utilized, the highest fundamental  
modulation audio frequency shall not exceed 3000 cycles  
per second, and the difference between the modulating  
audio frequency for the mark signal and that for the  
space signal shall be less than 900 cycles per second.

This proposal is based on the following considerations:

#### Experimentation

In recent years, with the availability of teleprinters to  
the Amateur Service, a number of experimentally-inclined  
amateurs have been using radioteleprinter communication,  
first with audio-frequency-shift keying primarily on the  
14-Mc. band and, since the Commission's authorization  
for the use of F-1 emission on lower-frequency bands, with  
carrier frequency-shift-keying in the non-voice portions of  
the 3.5-, 7-, and 14-Mc. bands. Although at one time the  
number of available printer units sharply limited the  
number of amateurs who could engage in this work, at  
present there is an adequate supply of such units with the  
result that amateur use of F-1 teleprinter communication  
is increasing rapidly. The League believes that this is  
another field in which the amateurs can contribute to the  
advancement of the art, but amateurs are now handicapped  
with the limitation of frequency shift within the range  
800-900 cycles per second. A number of leading amateurs  
in this field have indicated a strong interest in conducting  
experimental communication with lesser frequency shift,  
and the League believes they should be encouraged to do  
so. It is understood that commercial and military research  
groups also feel that a shift of considerably less than the  
present 850-cycle standard may well be found to be much  
more effective in teleprinter communication. The League  
urges the Commission to permit amateurs to take part in  
this investigation.

#### Improvement in Techniques

A reduction in permissible frequency shift will allow the  
use of receivers with narrower bandwidth, resulting in an  
improvement in signal-to-noise ratio. It will be possible to  
sharpen intermediate-frequency filters and amplifiers. It  
is also expected that a reduction in frequency shift will  
lessen the effects of selective fading, since this problem is  
eased when mark and space signals are brought closer to-  
gether. A smaller frequency shift is also more easily obtain-  
able when using crystal control, compared to the present  
difficulty of achieving direct 850-cycle shifts with 3.5-Mc.  
crystals.

#### Reduction in Interference

Although this is a matter of lesser importance, it should be  
mentioned (if only to point out that potential interference

(Continued on page 130)

# LAFAYETTE'S SPECTACULAR MONEY SAVERS

Argonne

## TRANSISTOR TRANSFORMERS

AT LAST A COMPLETE LINE OF QUALITY TRANSFORMERS FOR EVERY TRANSISTOR APPLICATION AT A PRACTICAL PRICE!

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AR-100	Input	200,000	1,000	.0	3600	90	1" x 3/4" x 3/8"
AR-101	Input	100,000	3,000 CT	.5	3600	60	1" x 3/4" x 3/8"
AR-102	Input	100,000	1,500 CT	1	3600	40	1" x 3/4" x 3/8"
AR-103	Driver	20,000	2,000 CT	.0	400	50	1" x 3/4" x 3/8"
AR-104	Driver	20,000	1,000	1	600	30	1" x 3/4" x 3/8"
AR-105	Driver	20,000	1,000	1	620	250	1" x 3/4" x 3/8"
AR-106	Driver	15,000	4,000	1.5	1000	20	1" x 3/4" x 3/8"
AR-107	Driver	10,000	3,000 CT	0	200	100	1" x 3/4" x 3/8"
AR-108	Driver	10,000	2,000 CT	0	500	50	1" x 3/4" x 3/8"
AR-109	Driver	10,000	25	2	600	2.5	1" x 3/4" x 3/8"
AR-110	Output	10,000	100	1	600	10	1" x 3/4" x 3/8"
AR-111	Output	5,000	200	1	120	25	1" x 3/4" x 3/8"
AR-112	Output	3,500	1,000	9	100	60	1" x 3/4" x 3/8"
AR-113*	Driver	3,000 CT	11	10	150	650	1" x 3/4" x 3/8"
AR-114	Output	2,500	8,000 CT	4	120	20	1" x 3/4" x 3/8"
AR-115	Input	2,000 CT	200	.0	20	1.5	1" x 3/4" x 3/8"
AR-116	Output	500 CT	16	0	20	1.5	1" x 3/4" x 3/8"
AR-117	Output	500 CT	3.2	0	20	.3	1" x 3/4" x 3/8"
AR-118	Output	500 CT	11	1	20	.9	1" x 3/4" x 3/8"
AR-119	Output	500 CT	3.2	.0	11	.3	1" x 3/4" x 3/8"
AR-120*	Output	300 CT	3.2	2	11	.50	1" x 3/4" x 3/8"
AR-121*	Output	250 CT	3.2	0	20	1.3	1" x 3/4" x 3/8"
AR-122*	Output	200 CT	16	.0	.14	50	1" x 3/4" x 3/8"
AR-123	Input	3	4,000	.0			
AR-124*	Input	3	4,000	.0			
AR-125	Input	3	4,000	.0			

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TRANSISTOR  
TYPE 2N107  
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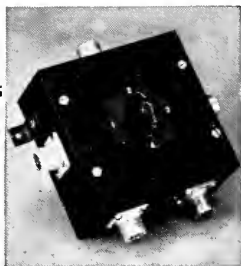


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to other types of emission in these amateur bands will certainly not be increased) that it is expected the use of a lesser frequency shift will accomplish a reduction in interference. Since, practically speaking, an F-1 signal uses the spectrum space of a c.w. signal with corresponding on-off keying, plus the frequency shift, it is apparent that a smaller shift will occupy less spectrum space and thereby provide less opportunity for interference.

\* \* \*

In summary, the League believes that authorization for amateurs to employ F-1 emission frequency shifts less than 900 cycles per second will permit more extensive experimentation with radioteletypewriter communication, will result in an improvement in and simplification of teletypewriter techniques, and thereby will provide a more reliable means of communication.

AMERICAN RADIO RELAY LEAGUE, INC.

By PAUL M SEGAL

QUAYLE B. SMITH

Its Attorneys

A. L. BUDLONG  
General Manager  
July 6, 1955

### MINUTES ERROR

A typographical error appears in the 1955 Board meeting minutes in July *QST* (paragraph 59). Mr. Cowan of the West Gulf Division, not Mr. Gowan of the Dakota Division, is the third member of the Finance Committee. Mr. Gowan is, as reported in paragraph 65, on the Membership & Publications Committee.

### Operation Alert

(Continued from page 51)

official who could not be contacted by telephone. W3AVL and W3ZZK relayed traffic via 2 meters to WN3ZYB in Calvert County. Eighteen c.d. messages were handled during the alert. Participating amateurs received congratulations from the county Civil Defense Director for the manner in which these messages were handled.

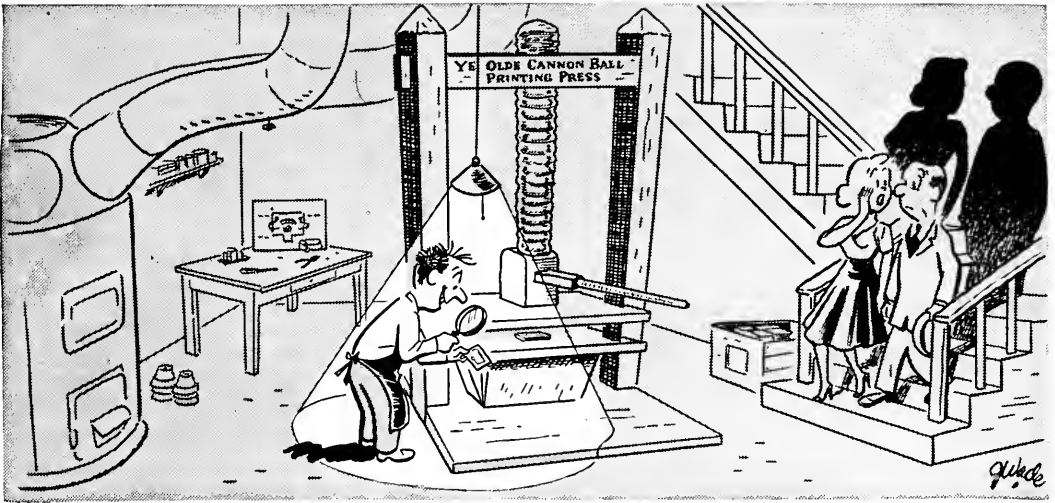
### Massachusetts

In Winthrop, EC and RO W1BB alerted his group to participate on the basis that radio was the *only* means of communication. Both control and alternate control stations were operated, on six meters. The test was conducted on an area basis, although local stations were ready and standing by.

Acting EC and Radio Officer W1WGN reported some confusion in New Bedford as to whether the city was to be bombed or not. Nevertheless, amateurs participated wholeheartedly. The control station was operated from 1200 to 2145 by five amateurs to maintain contact with sector headquarters, with mobiles in New Bedford and the center of the city. Ten and two meters were used.

Sector 1-B, which includes 21 cities and towns in Eastern Mass., was activated from Quincy City Hall by nine amateurs. Seventeen towns reported into the nets on ten and two meters. Net control W1IA was on the air from 1130 the 15th until 1330 the following day.

(Continued on page 132)



## "Fred's really gone on those printed circuits!"

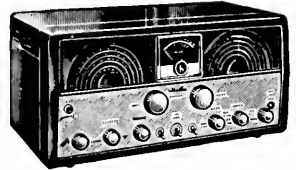
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Less speaker. Net \$149.95



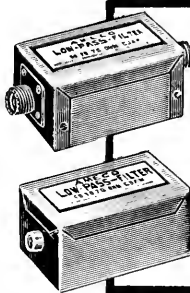
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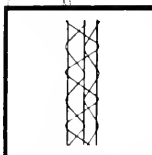
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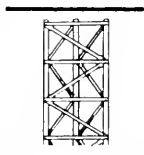
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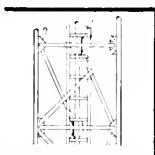
Use—Mast for TV  
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Height to 280'  
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Height to 600'  
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Use—TV Broad-  
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TOO!**

EC and RO W1SPF of Worcester reports participation by five amateurs and two non-amateur operators. The city was "bombed" at 1428, smashing all communications in Worcester, leaving only one control center and two mobiles in operation. Those left had a mighty hard time of it, demonstrating that additional and more dispersed facilities are needed.

Sector 1-C was alerted at 1800 and was on the air until 2300. Traffic was handled regarding food shortages for the evacuees who had been moved from Boston to Framingham. Communications from Framingham to sector headquarters in Sherborn was on 50,745 kc. The Sector 1-C RO is W1ZOP, the EC W1MEG. The latter is also alternate radio officer and sent us this information.

Waltham EC W1JSM reports that they were alerted for control center and zone base action from 1800 to 2300 on the 15th. Four amateurs were active. The local net tied in zone bases to the control center.

## Michigan

Although not yet authorized for RACES, the AREC gang at Sault Ste. Marie was active. W8NTD, the Twin Sault Radio Club's station,



This station was set up in the basement of the FCDA Building in Battle Creek, Mich., to provide contact with Goguae Lake Naval Training Center during exercises connected with Operation Alert in FCDA's Region IV. That's W8YAN at the mike, while W8SSH monitors a receiver.

was on the air for help in relaying traffic. The mobile control station, located in a specially-built bus, was supported by four mobiles for local operations, with seven other operators participating. Communications between the two Saults in Michigan and Ontario were conducted on ten meters.

(Continued on page 134)

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### ADVENTURER CW Transmitter Kit

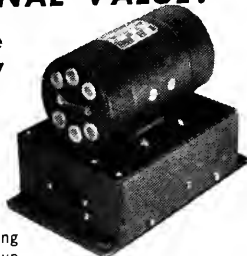
**COMPLETELY SELF-CONTAINED!** Power input — 50 Watts • Effectively TVI suppressed • Pi-network output tuning — no antenna tuner needed • Single knob Bandswitching on 80, 40, 20, 15, 11, 10 meters • COMPACT! 7 3/8" high x 10 3/8" wide x 8 1/8" deep. No. 240-181-1 VIKING ADVENTURER KIT, with tubes, less crystals and key. Complete with easy assembly and operating instructions. **\$54.95**



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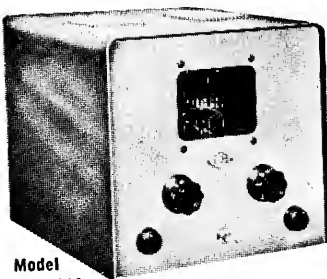
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Model  
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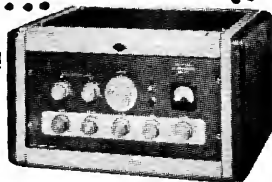
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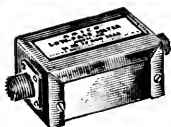


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## New Jersey

Maplewood EC W2COT reports sixteen stations on stand-by, of which five were mobile, but no local incidents were attempted.

## New York

K2DVC, EC and RO of Genesee County, N. Y., combined his RACES and AREC operators for a successful RACES test on RACES frequencies. K2IDQ set up his rig at c.d. headquarters. Activity commenced shortly before noon on the 15th and continued until 1022 the 16th. Ten and six meters were used. Everything went off fine, says K2DVC, and the c.d. director was very pleased and impressed.

## Ontario

VE3AIB took over in Operation Alert due to the absence of the regular communications officer (and Toronto EC) VE3IL. Operation was conducted on 80, 75, 40, and 2 meters, concerned primarily with traffic direct between the various regional headquarters and provincial headquarters at Toronto. Most regions also operated their own amateur nets on other frequencies. This set-up worked very well during the hours 1800 to 2300 EST on the 15th.

## Pennsylvania

Philadelphia County's Operation Alert was primarily concerned with evacuation procedures. Four sample evacuations were conducted, one from each of the city's four c.d. regions. Communications with the caravans were maintained at all times to the respective regional control centers on 29 Mc. A Navy blimp carried civil defense observations, communications with Philadelphia's Mobile Communications unit being conducted on RACES frequencies under the call K2NBD. The mobile unit operated as W3YXU/3. This mobile unit also maintained contact with the four control centers on 29 Mc. The turnout was large and very encouraging. EC W3DYL lists 41 amateurs and 10 amateur/RACES mobiles participating.

## Puerto Rico

Puerto Rican amateurs participated in Operation Alert through their club station KP4ID, located at c.d. headquarters in Rio Piedras. This station was on the air from 0800 through 2030 on June 15th. Operation was on 3925 kc. Sixteen stations on Puerto Rico and the Virgin Islands checked in, handling 53 messages. Stations were also located at Gurabo C.D. Headquarters and Ramey Air Force Base, the latter maintaining contact with FCDA Regional headquarters in Thomasville, Georgia. A total of 22 amateurs participated.

## Tennessee

Five amateur stations were set up and operating in Chattanooga when the yellow alert was sounded on June 15th, according to newspaper clippings sent us. J. D. Rivers was in charge of

(Continued on page 136)



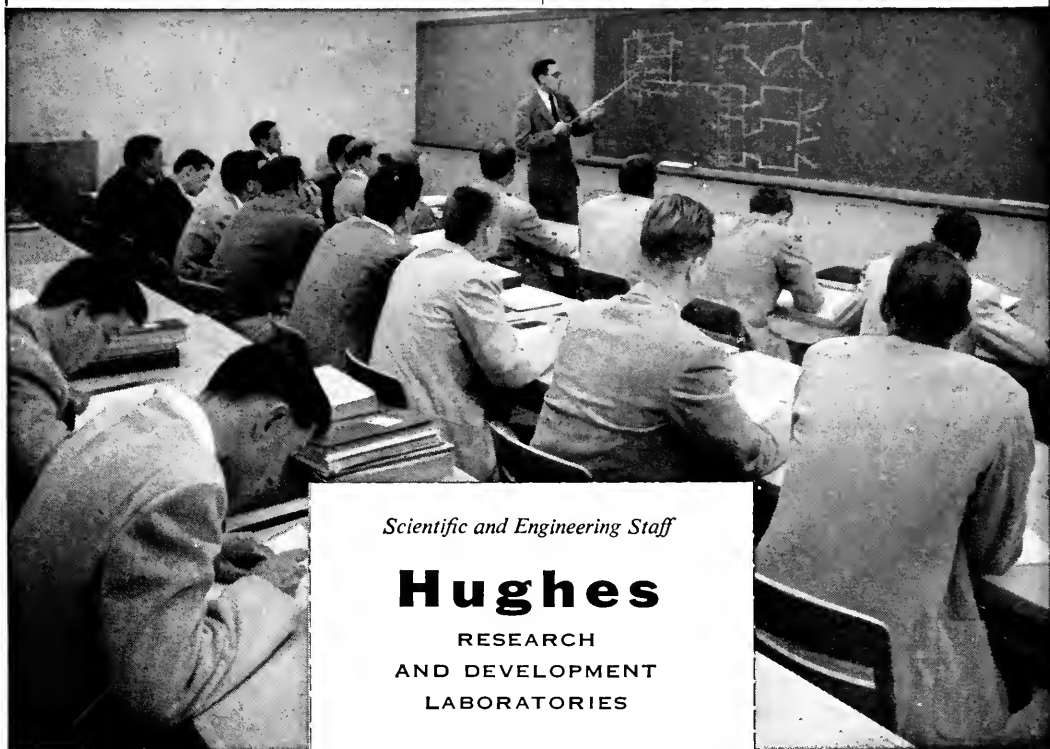
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No. 5BC-F Coils only for phone bands **\$12.95**

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the RACES group, maintaining communications with other cities in the state. More than 50 operators participated, and amateurs supplied their own equipment.

Eight emergency-powered rigs were used by the Oak Ridge gang over a 24-hour period. SEC W4RRV was present at c.d. headquarters, along with the city manager and c.d. director. All transmitters were of home construction.

### **Virginia**

The Hampton RACES organization, under EC W4AJA and RO W4RGN, provided the nucleus for Operation Alert in the Hampton-Newport News-Warwick area. Nine amateurs staffed the control station in Hampton, while W4AJA acted as alternate control. Local units were not alerted, the tricities set-up acting in support of Norfolk, the target area. Sixty-five official messages were handled.

No previous planning was made in Norfolk, but 32 amateurs responded to the alert, 20 of whom were mobile. Assignments were made on the air or in person after the alert. At 1545 all mobile and portable stations were called in for regrouping and reassignment. Most traffic from then on was directed to Richmond (state control). A total of 99 messages were handled. The boys had their transmitter and antenna troubles, but the drill went off successfully.

The Falls Church RACES net held their own exercise on 29,580 kc. RO W4OP operated the control station, and mobiles were stationed at check points on evacuation routes. Four mobiles and four fixed stations participated, handling nine messages without difficulty. C.D. headquarters RACES station in Fairfax was covered by mobile W4TNQ, with W4ZNU assisting, maintaining communication with Falls Church on 145.3 Mc.

### **Conclusions**

The first, and most obvious, conclusion is that a great deal more activity was conducted than has been reported above. We can report only the information we receive. Secondly, we congratulate and commend *all* who participated, whether an authorized or pending RACES group, on their representation of amateur radio in this very important national activity very much in the public eye. Thirdly, and last but not least, we want to point out to those who operated outside RACES frequencies (although they undoubtedly already know it) that they are conducting tests that are almost totally unrealistic in view of the certainty that *only RACES frequencies under RACES* will be available after any commencement of hostilities. It doesn't matter, unfortunately, that these frequencies are not sufficient for our needs. Until or unless additional frequencies can be made available, we have to plan to use the ones we have.

Thanks to those who reported for making it possible for us to give some idea of participation by amateurs in civil defense throughout the nation.

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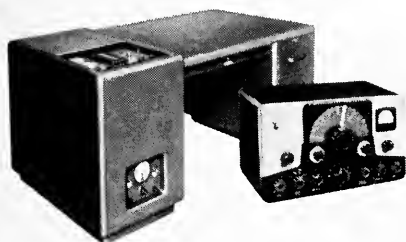
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## New! Johnson Viking Kilowatt

1 KW CW • 1 KW AM • 1 KW SS

Amateur net: complete (wired, tested, with tubes) \$1595.

Gray finish, maroon top, green nomenclature.

Left or right accessory desk top \$123.50.

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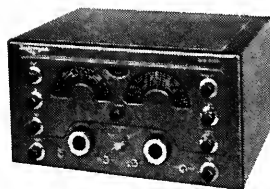
75 watt CW • 65 watt fone • Grid block keying

Ideal to drive the Viking Kilowatt.

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540 KCS to 31 MCS plus 48 to 56 MCS. Dual Conversion.

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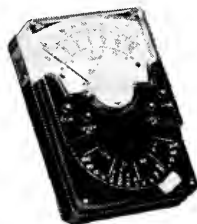
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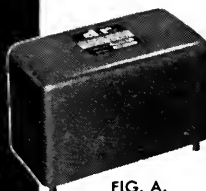


FIG. A.

**SSB 22-25 KC. FILTER** and component kit for 25-kc. carrier use with ring modulator. 500-ohm c. t. input, 100,000-ohm c. t. output. Essential component kit includes filter unit (fig. A above), toroidal 25-kc. oscillator coil and tuning capacitor, copper-oxide ring modulator, schematic.

**Component kit: \$34.50**

**RTTY "MARK" AND "SPACE" FILTER SET.** 500 ohms in and out. "M" filter 1700-2550, "S" filter 2550-3400, both filters mounted as fig. A above.

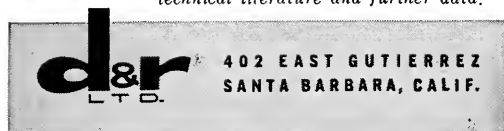
**Set: \$43.00**

**RTTY "INPUT" FILTER.** 500 ohms input, 15,000 ohms output. Response 1700-3400, down 25 db at 1400 and 3800, mounted as fig. A above.

**Filter unit: \$24.00**

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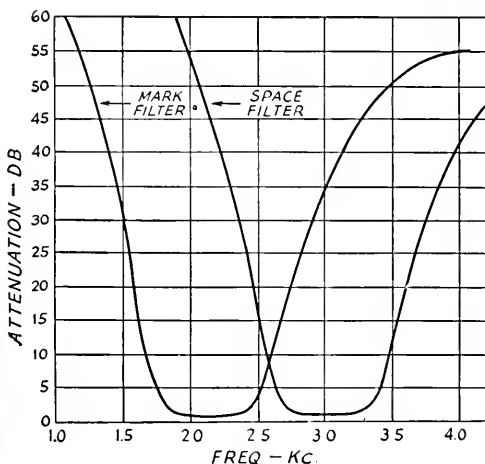
W0ILB

"RED ROOM" DISPLAY COACH K0AST

## New Apparatus

### Radioteletype Filter Set

One of the stumbling blocks to RTTY operation has been the receiver-converter filters used to separate the "mark" and "space" signals, and amateur "scrounging" of one type or another has usually been the only recourse. This situation has been improved by the recent availability of the BF-M1 and BF-S1 Radioteletype Filters. These compact ( $4\frac{3}{8}$  by  $2\frac{3}{8}$  by  $2\frac{1}{2}$  inches high) units have the characteristics shown in the manufac-



turer's curves below, and an application sheet accompanying each filter shows a practical circuit in which the filters can be used. The characteristic impedance of each filter is 600 ohms, and the insertion loss is 2 db.

The BF-M1 and BF-S1 Filters are manufactured by D & R, Ltd., 402 East Gutierrez St., Santa Barbara, Calif.

— B. G.

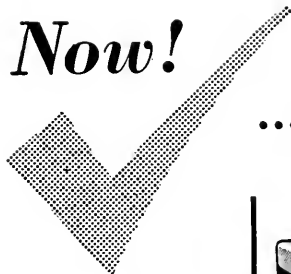
## Strays

BCI and TVI are (alas!) familiar terms, and by no means amusing. But here is a collection of interference abbreviations, turned up from QST files, that are surely novel and in some cases downright strange:

- GDI — Garage door interference
- BTI — Bath tub interference
- WPI — Water pipe interference
- OAI — Organ amplifier interference
- HAI — Hearing aid interference
- SPI — Stove pipe interference
- MPI — Motion picture interference
- RPI — Record player interference
- PAI — Public address interference
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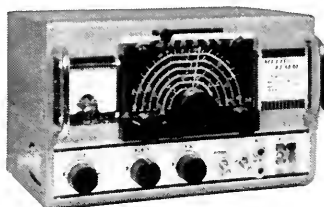
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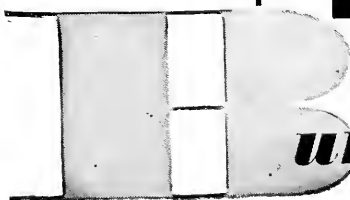
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In his new assignment, Admiral Bruton is returning to the field of communications in which he served during the early part of his naval career following his graduation from the U. S. Naval Academy in 1926. He is holder of an amateur



radio license (since 1920), a degree in radio engineering from the University of California, and a law degree from George Washington University.

A large part of his career has been in the submarine service. During World War II, as commanding officer of the USS *Greenling*, he completed four successful submarine patrols, credited with a total of 11 sinkings. He also participated in the Korean hostilities as commanding officer of the USS *Wisconsin*.

Admiral Bruton's assignments have included Administrative Aide to Fleet Admiral Chester Nimitz when he was Chief of Naval Operations, and Aide to Fleet Admiral Ernest J. King when he was Commander-in-Chief, U. S. Fleet. From June, 1953, to September, 1954, he was Commander of the Navy task group at the Bikini atom bomb tests, and then was named Deputy Chief of Naval Operations (Administration).

Admiral Bruton holds several military awards, including the Navy Cross. He is a member of the ARRL. His present call is W4IH and although he is now inactive on the ham bands, he periodically threatens to open up again any day.

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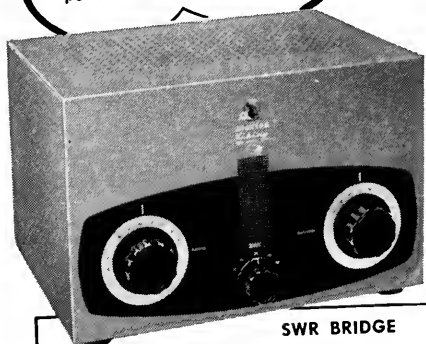
Equipped with a heavy duty antenna changeover relay, the Kilowatt "Matchbox" permits separate matching of the antenna to the receiver and also has provision for muting the receiver when transmitting. An electronic time delay circuit prevents arcing of the relay contacts and provides protection for the transmitter components from undue stress of momentary high voltage surges during changeover. Nominal input impedance is 52 ohms—may be used with any transmitter operating up to and including 1000 watts.

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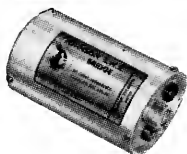
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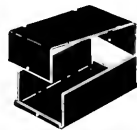
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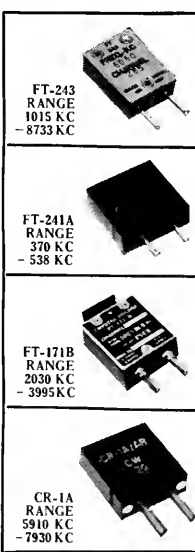
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49c each — 10 for \$4.00	79c each — 10 for \$6.50
370 393 414 483 506 529	400 459
372 394 415 484 507 530	440 461
374 395 416 485 508 531	441 462
375 396 418 487 509 533	442 463
376 397 419 488 511 534	444 464
377 398 420 490 512 536	445 465
379 401 422 491 513 537	446 466
380 402 423 492 514 538	447 468
381 403 424 493 515	448 469
383 404 425 494 516	450 470
384 405 426 495 518	451 472
385 406 427 496 519	452 473
386 407 431 497 520	453 471
387 408 432 498 522	454 475
388 409 435 501 523	455 476
390 411 436 502 525	456 477
391 412 438 503 526	457 479
392 413 481 504 527	458 480

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CR-1A SCR 522-½ Pin, 1/2" SP	FT-171B — BC-610 Banana Plugs, 1/4" SPC
5910 7350	2030 2220 2360 3202 3850
6370 7380	2045 2258 2390 3215 3945
6450 7390	2065 2260 2415 3237 3955
6470 7480	2082 2262 2435 3250 3995
6497 7580	2105 2290 2442 3322 3995
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6547 7930	2145 2305 2545 3520
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4035 5385 5892 6700 7575 7850	
4080 5397 5900 6706 7583 7873	
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4190 5437 5925 6740 7606 7900	
4280 5485 5910 6750 7625 7906	
4330 5500 5915 6773 7640 7925	
4340 5582 5973 6775 7641 7940	
4397 5660 6206 6800 7650 7950	
4445 5675 6225 6825 7660 7975	
4450 5677 6240 6850 7673 8240	
4490 5700 6250 6875 7675 8250	
4495 5706 6273 6900 7700 8273	
4535 5740 6275 6925 7706 8280	
4195 5750 6300 6950 7710 8300	
4735 5760 6306 6975 7725 8306	
4840 5773 6325 7450 7740 8310	
4852 5775 6340 7473 7750 8316	
4930 5780 6350 7475 7766 8320	
4950 5806 6373 7500 7773 8325	
5030 5840 6375 7506 7775 8630	
5205 5850 6400 7520 7800 8683	
5295 5852 6406 7525 7806 8690	
5305 5873 6425 7540 7825	
5327 5875 6673 7550 7840	
5360 5880 6675 7573 7841	

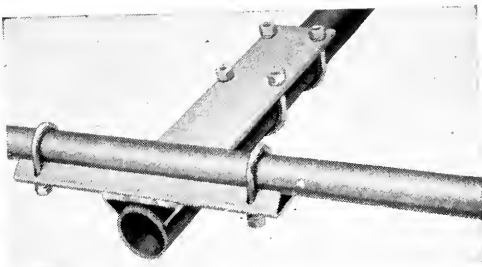
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1015 6100 6540 7150 8150 8500	
3655 6106 6550 7250 8173 8525	
3680 6125 6573 7300 8175 8525	
3735 6140 6575 7306 8200 8558	
3800 6150 6600 7325 8225 8566	
3885 6173 6606 7340 8340 8575	
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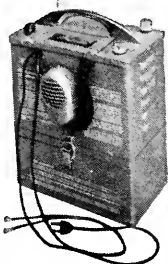
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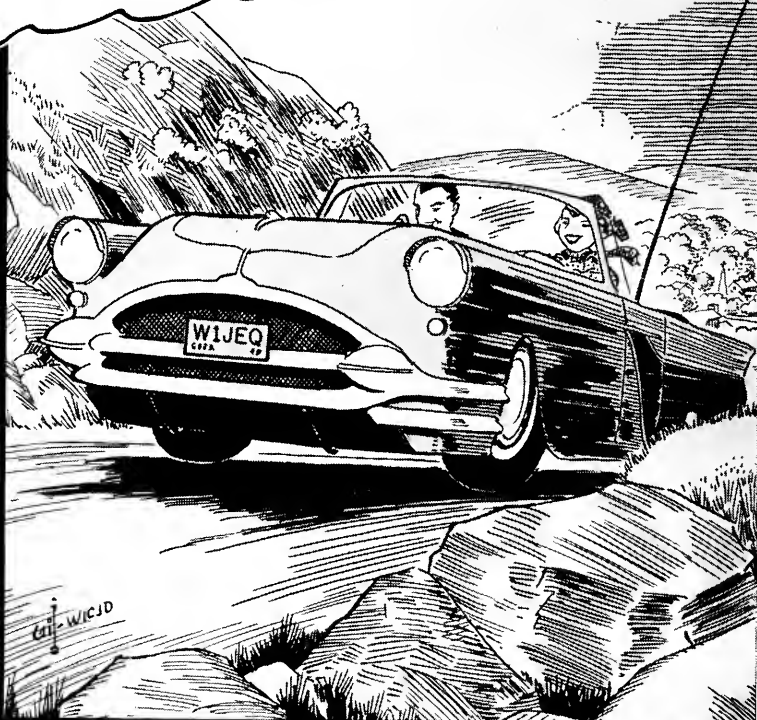
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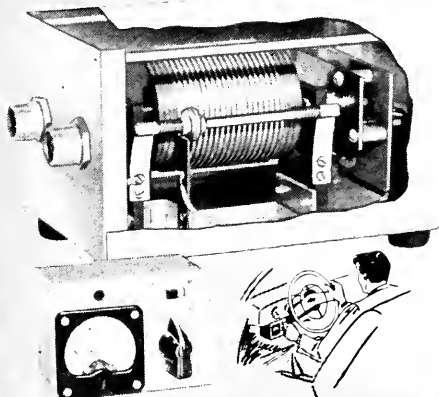
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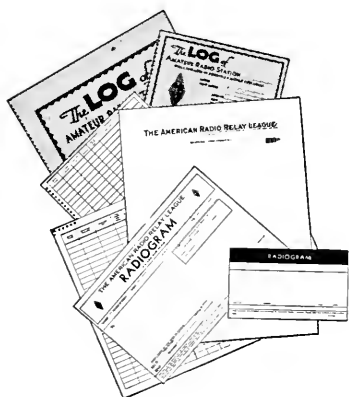
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# HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

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(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature, and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply. To expedite handling of your copy please state whether you are a member of ARRL.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred, but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

*Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.*

**QUARTZ**—Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

**MOTOROLA** used FM communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

**WANTED:** Cash or trade, fixed frequency receivers 28/42 Mc. W9Y1Y, Troy, Ill.

**WANTED:** Early wireless gear, books, magazines and catalogs. Send description and prices. W6GH, 1010 Monte Drive, Santa Barbara, Calif.

**CODE slow?** Try new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

**SUBSCRIPTIONS:** Radio publications. Latest Call Books, \$4.00. Mrs. Earl Mead, Huntley, Montana.

**URGENTLY** need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

**OUTSTANDING** ham list always. Our prices on trade-ins of all amateur brands are realistic and down to earth. We have Johnson, National, Collins, Hallicrafters, Gonset, Elmac, Harvey-Wells, Morrow, Central Electronics and other leaders. We trade easy and offer our own time-payment plan tailored to fit you. All leading brands of new equipment always in stock. Write today for latest bulletin, Stan Burghardt, W0BJV, Burghardt Radio Supply, Inc., Box 41, Watertown, S. Dak.

**ANTENNA** for bandswitching transmitters up to 300 watts input, approx. 120 feet long, centered with 75-ohm line, 70 feet included, low SWR, tunes 80–40–20–10 meter bands. U. S. Patent 2,535,298. Each one tested for resonance on all bands. Send stamp for details. \$18.95 each. Lattin Radio Laboratories, 1431 Sweeney St., Owensboro, Ky.

**MICHIGAN HAMS!** Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel. 8-8696. No. 8-8262.

**2-METER** aluminum Brownie beams, \$22 and up. Write to H. W. Snyder, W3LNC, 4330 Glenmore Ave., Baltimore 6, Md.

**WANTED:** All types aircraft & ground transmitters, receivers, ARC-13, RT18/ARC1, 5S/ARN7, BC610E, BC221 mounts and parts wanted. Fairest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

**LEECE-NEVILLE** 6 volt system. 100 amp. alternator, regulator & rectifier, \$60.00. Also Leece-Neville 12-volt system 100 amp. alternator, regulator & rectifier, \$85.00. Good condition. H. A. Zimmermann, 570 Jamaica Ave., Brooklyn 8, N. Y. Ulster 2-3472.

**NEW** and used Motorola, Link, RCA, G-E, etc., FM commercial communications equipment bought & sold. Allan M. Klein, W2FOU, 95-33 225th St., Bellerose, L. I. N. Y. Phone FL 4-3394.

**VAN SICKLE** has the new or used gear. Taylor 866As, \$1.95. Gene, W9KJF, 1320 Calhoun, Ft. Wayne, Indiana.

**WANTED:** ART-13 transmitters. Write B. Spivey, 3117 Rolling Road, Chevy Chase, Md.

**CASH** for AN/ARC-1, BC-610E, BC-614E, BC-939, BC-729, BC-221, TCS and others. Also Sig. Corps, Navy, Air Force stock catalogs; maint. and instr. TM's for war surplus equipment. Amber Co., 393 Greenwich St., New York 13, N. Y.

**OUTSTANDING QSL** samples 25¢ (refunded). Fall Callbooks, \$4.00. Sakkers, W8DED, P. O. Box 218, Holland, Michigan.

**QSL-SWLS:** Meade W0KXL, 1507 Central Avenue, Kansas City, Kans.

**QSLs, SWLS:** America's Finest!!! Samples 10¢. C. Fritz, 1213 Briargate, Joliet, Ill.

**QSL-SWLS:** 100, \$2.85 up. Samples 10¢. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

**QSLs:** Nice designs. Samples. Beesparis, W3QCC, 207 S. Balliet St., Frackville, Pa.

**QSL Specialists:** Distinctive. Samples free. DRJ Studios, 1811 No. Lowell Ave., Chicago 39, Ill.

**DELUXE QSLs**—Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10¢.

**100 Free QSL cards** with order. Samples 10¢. World Printing, 166 Barkley, Clifton, N. J.

**QSL-SWLS:** Samples free. Bartinoski, W1YHD, Williamstown, N. J.

**QSL-SWLS:** Cartoons, Rainbow, others. Reasonable. Samples 10¢ (refunded). Joe Harms, 225 Maple Ave., North Plainfield, N. J.

**QSLs** of distinction! Three colors and up, 10¢ brings you samples of distinction. Uncle Fred, Box 86, Lynn, Penna.

**QSLs:** Samples free. Albertson, W4HJ1, Box 322, High Point, N. C.

**QSLs!** Two colors, \$2.00 hundred. Samples for stamp. Rosedale Press, Box 164, Asher Station, Little Rock, Ark.

**QSLs "Brownie,"** W3CJ1, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

**QSL-SWL cards:** Sensational offer. Bristol stock 500 1 color \$3.95, 2 color \$4.95, 3 color \$5.95. Super gloss \$1.25 extra. Rainbow cards. Samples 10¢. QSL Press, Box 71, Passaic, N. J.

**QSL samples:** Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

**QSLs:** Postcard brings samples. Fred Leyden, WINZJ, 454 Proctor Ave., Revere 51, Mass.

**QSL-SWLS:** Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

**QSLs:** Beautiful blue, silver and gold on glossy cards, \$3.85 per 100 or \$7.50 for 200 postpaid. 2 day service. Satisfaction guaranteed. Order and get pleasant surprise. The Constantine Press, Bladensburg, Maryland.

**QSLs:** Western states only. Fast delivery. Samples 10¢. Dauphinee, K6JCN, Box 66009, Mar Vista 66, Calif.

**QSLs:** Samples dime. Printer, Corwith, Iowa.

**QSL-SWLS:** Samples free. Backus, 5318 Walker Ave., Richmond, Va.

**QSL-SWLS:** Cartoons, Rainbow, others. Reasonable. Samples 10¢ (refunded). Joe Harms, W1GET (W2JME), Plaistow, New Hampshire.

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**QSLs, SWLS:** Samples free. Jones, W3EHA, 840 Terrace, North Hagerstown, Maryland.

**QSLs:** 2-colors, 125, \$2.00. Samples 10¢. Bob Garra, W3UQL, Lehighton, Penna.

**QSLs:** Highest quality. Quick delivery. Samples 10¢. Dortch, W4DDF, Jocelyn Hollow Road, Nashville, Tenn.

**QSLs, SWLS:** High quality. Reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

**QSLs:** The kind you want. Graphic Crafts, Route 12, Ft. Wayne, Ind.

**QSLs!** Modern, better quality designs. Samples 10¢. Tooker Press, Lakehurst, New Jersey.

**CANADIAN QSLs:** New designs, high quality, fast service. \$2.00 up. Samples 10¢. Art Beynon, VE3WV, 14 Loine Ave., Collingwood, Ont., Canada.

We will be looking for you at the ARRL Central Division Convention at South Bend, Indiana, October 15-16 are the dates. This will be the Big One for 1955! Advance registration \$3.50. Write to: Box 551. Make checks payable to Central Division Convention. Do it now!

**SORRY** fellas, my ad ran a month ahead of time, in July QST, due to misunderstanding. QTH uncertain at that time. Apologize for any inconvenience. Am now repeating it, ready for queries: Trade: Argus C-4, 35 mm camera, 2.8 lens, flash gun, leather carrying case; all new in original carton and Hallicrafters S20R recvr in gud condx for Hammarlund HQ-129X, in A-1 condx. K4BGG, Joe S. White, 5892 Lemon Ave., Long Beach, Calif.

**HAMMARLUND HQ-129X** for sale. In perfect electrical, physical and mechanical cond. Late model. Has HQ-140X bandspread dial (covers 15 meters). \$165 or best offer. Dave Smith, K2CHS, 54 Butler Road, Scarsdale, N. Y.

**SALE:** Lysco 600, also AM modulator. Roger Simmons, Ashland, Ohio.

**NEED ARC/3s.** S. Gabriel, 4908 Hampden Lane, Washington 14, D. C.

**W5AX1/AM** correct mailing QTH Arthur E. Hutchins, R/O SS Fullerton Hills, Bernuth Lembecke Co., 420 Lexington Ave., New York 17, N. Y.

**FREE** list: parts, gadgetry, meters, oddities. Art Sorrell, W3AXG, 6310 63rd Pl., Riverdale, Md.

**NEED ARC-1s.** Lou Athanas, P. O. Box 5878, Bethesda, Md.

**TRADE:** New 804s, 2111s, 304TLs, 833As, 450TLs, 128As for NC183D, SX-88, KW xmtr, etc. Dodge, Box 3221, Eastchester, Anchorage, Alaska.

**SELL:** ARC-5 converted to 85 Kc, I.F. similar to June 1955 QST article, with dynamotor, \$20.00; have full set of major components for 500 watt, 813 final, \$60.00; new Johnson Low Pass, \$9.00; American DHT mobile mike, \$7.00; American D4 dynamic mike, \$7.00 and pair of Bealm coils on base with relay, \$6.00. W0RAK, Moline, 623 No. 5th, St. Peter, Minn.



VIKING II with V.F.O. Not more than 10 hours use. First \$250 takes it. Bob Slamp, Box 303, Baldwin, Michigan.

ART-13 Wanted: W4VHG, 4908 Hampden Lane, Bethesda, Md.

SELL: Viking I and VFO. Won't ship. TVI-suppressed. Perfect condition. High rate element 15 over 3 element 20 beam. Never used. Still in original carton: \$75.00. Cost me \$125.00. Niagara low pass filter \$5.00. Multitester voltohmmeter, \$5.00. Filament and low voltage transformers and miscellaneous. O'Brien, 48 Prospect, Westwood, N. J. Westwood 5-1494M. New York. Tel. COLUMBUS 5-3700.

FOR Sale: Used Heathkit AT-1 transmitter. Goes to the first offer over \$20.00. Richard Bristo, W8UBA, RFD #1, Almont, Mich.

18TH ANNUAL "Stag Hamfest." Biggest Bargain Hamfest in U. S. A. Over 800 actual amateurs attended last year. Sponsored by the Greater Cincinnati Amateur Radio Association. Sunday September 11th. The location is Kopley Grove on Whinton Road two miles south of Greenhills, Ohio. Registration: \$2.50 at the gate and here's what you get: hot dogs all day long, donuts & coffee served (til noon, beer and pop served all day, full picnic dinner and supper (all you can eat). Rain or shine. Games, radio controlled model airplane show, etc. For additional information contact Elmer Schubert, W8ALW, 3956 Harnar Court, Cincinnati 11, Ohio.

SSB Station: New 20A exciter plus matching 500w linear amplifier, plus matching 20 custom VFO: \$475.00. F.O.B. George W. Korper, Jr., W1CFE, Northrop Road, Woodbridge, Conn.

RECEIVERS-Transmitters, repaired and aligned by competent engineers, using factory standard instruments. Collins-authorized service station, Hallicrafters, Hammarlund, National. Our nineteenth year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

BC-610E, speech amplifier, mike, spare parts. WAS and DXCC 10 meter phone. \$500.00. C. J. Ahern, Jr., W9WXT, Dwight, Ill.

V70D, Bud Gimix wavemeter, sale/trade. Need small modulator (pr 61.6, etc.) with pwr supply, same chassis. Camden area preferred. W2VMX, 609 Park Ave., Collingswood, N. J. JO 5-2360.

WANTED: S-40A or NC57. Hamilton, W8WFF, Box 282, Wiloughby, Ohio.

SELL: 65 w cw mmttr. Coils, xtals for 80, 40. Rose W9ALO, 120 So. Reader, Mounds, Ill.

COLLINS 75A2 with spkr. Like new, \$325. Dr. Donald Spaan, Santa Monica Hospital, Santa Monica, Calif.

JOHNSON Ranger, factory-wired, used only 10 hours, \$225; Johnson Rotomatic dual 10-20 meter beam (parastic), includes motor, direction indicator and change-over relay, 100 ft. control cable, \$225. Purchaser pays freight or express charges. Sam J. Rhoades, Jr., W5RVX, 1330 S. Atlanta Place, Tulsa, Okla.

SELL: Complete station, Heathkit, AT-1 xmitter, AR-2 rcvr, VF-1 VFO, AC-1 coupler, \$75.00 takes all. Perfect condx. 1 year old. Jim Rogers, W8RSC, 220 Iberia St., Mt. Gilead, Ohio.

TV Hams: 5527 Camera and BC-645 xmitter. Details on request. W9GNC, Bruce Thatcher, 263 N. Hyland, Ames, Iowa.

ART-113, unmodified ATC model with dynamotor, \$250.00; 500 watt modulator, pair 815, S-2 xfrmr, \$40.00; BC654 PE103, metal stand, \$15 final generator, \$5.00; Johnson Var. 151 udd 7000 volts, \$6.00; new Thordarson 2000 volts at 300 Ma., \$22.00; 1000 V at 125 Ma., \$6.00; 50 hr. at 40 Ma., \$2.00; B&W 500 watt series inductors 80 & 40 meters, \$4.00 each. Tex Dallas, W3RZV, Tamaqua, Pa.

VIKING II, Viking VFO, VT keyer, \$250.00. Will deliver within 100 miles. W9UQT, 2212 So. Webster, Kokomo, Ind.

LETTINE 240 and VFO \$65.00; BC455, new, \$5.50; two BC459's; 40 & 80 converted, \$14.50; S-2 xfrmr, \$40.00; BC654 PE103, metal stand, \$15 final generator, \$5.00; Johnson Var. 151 udd 7000 volts, \$6.00; new Thordarson 2000 volts at 300 Ma., \$22.00; 1000 V at 125 Ma., \$6.00; 50 hr. at 40 Ma., \$2.00; B&W 500 watt series inductors 80 & 40 meters, \$4.00 each. Tex Dallas, W3RZV, Tamaqua, Pa.

UFO Patrol data. W5CA.

COMPLETE Station: Viking I, TVI suppressed, S-40B; VFO, all accessories: \$350.00. K2DQH, Chris Lane, North Street, Harrison, N. Y.

BARGAINS — BC-342 receiver, A-1 condition, \$75.00; triangular self-supporting 36-foot aluminum tower, new, \$45. W1CEG, 183 Daly Ave., New Britain, Conn.

SALE: 200w. phone TVI suppressed, \$125.00; rcvr, \$75.00; Comp. mobile, Super 35, 5 w. RCA, ant., dynamotor, etc., \$50.00; PE101C, \$5.00; Sams 12 vols. \$100.00; Riders 14 vols. \$45; Hickok Tracometer, \$95; stamp for list. F.O.B. No trades. Jim McCoy, 2211E Pershing Blvd., Cheyenne, Wyoming.

FOR Sale or trade: Six Band mobile xmitter as on p. 436 of 1955 Handbook, \$60; KC modulation xfrmr Stancor \$389, \$35.00; Elmac mobile rcvr 6 or 12v, \$100. Need: Tecraft 2 mtr. converter and Millen Hi-freq. amplifier -90811, or what have you? Frank R. Leins, W4UCF, P.O. Box 302, Vidor, Texas.

SELL: Excellent SX-71 for \$150.00. Express prepaid in U. S. W7GND, 305 Ash St., Pullman, Wash.

813, 2 & 4-125As, yv FB condx, best offer. W9QHS, R. Jacobsen, 1901 Penn St., Minneapolis 5, Minn.

PANORAMIC Adapter AN/APA-10 Tech. Manuals, \$2.75 post-paid in U. S. A. Electronicraft, 27 Milburn St., Bronxville 8, N. Y.

NOVICES! For sale, fine Heathkit AT-1 with effective low-pass filter, a 30W xmitter with 350V power supply, high quality 80M doubler. Lowest prices. Ken Baragat, W9NMO, 1345 Elida St., Janesville, Wis.

BARGAINS with new guarantee and completely reconditioned: S38, \$29.00; S40A, \$69.00; S40B, \$79.00; S76, \$129.00; SX71, \$159.00; NC98, \$119.00; HQ140X, \$219.00; TBS50D, \$79.00; Meissner EX, \$39.00; Viking II, \$239.00; Viking VFO, \$39.00; HQ129N, SP400N, NC125, NC183D, NC240D, HR060, AR88, 75A1, 75A2, 75A3, 32V2, 32V3, PMR6A, AF07, Super 6, Converter, B&W \$100, many others cheap. Shipped on approval. Easy terms. Satisfaction guaranteed. List free. Henry Radio, Butler, Mo. HR060 ABCD, AC coils, crystal calibrator, first \$360. Want modulated LM frequency meter. Broughton, 3116 SE 39, Portland, Oregon.

LIKE New, factory-wired, 10A SSB exciter and converted BC458 VFO, \$105. UHF xmitter McMurdo Silver Phone/cw coils 144 and 220 Mc. 852-A final, \$20.00, W7PYG.

BARGAINS: With new guarantee: R-9er, \$12.50; S-38C, \$35.00; S-40B, \$79.00; Lyco 600, \$99.00; S-27, \$99.00; SX-43, \$129.00; S-76, \$149.00; S-77, \$169.00; SX-42, \$169.00; HRO-50, \$275.00; Sonar VFX, 680, \$29.50; Elmac FR7, V, \$39.50; Heath AT-1, \$22.50; Meck T60, \$49.50; HT-17, \$29.95; EX Shifter, \$39.50; Globe Trotter, \$49.50; Globe Champ, \$199.00; Harvey-Wells Sr., \$69.00; Elmac A-54, \$99.00; Viking I, \$179.00; Viking II, \$229.00; SS-75, \$169.00; HT-9, \$139.00; Globe King 400B, \$325.00; 32V1, \$375.00; 32V2, \$425.00; 32V3, \$525.00. Subradio or ST-203A xmitters, \$29.95. Free trial. Terms financed by Leo, W0CFQ. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

SELL/Trade: Heath OM-1, V-7, TC-2; V-M phonograph, Model 972-A; Eicor tape recorder, Model 230; Gardiner sender; Metronoma, chemical glassware barbell set. Send for complete list. Wanted: pocket recorder; camera; electronic flash; transistorized equip. Witmer, 39 Oneida Rd., Camp Hill, Penna.

WANTED: SW-3, SW-5, SW-45, SW-58, NC-98, NC-101A, NC-125, HRO-5, HQ-129X, SX-99, Millen 90711, Hart 75, DX-100, Adventurer, Morrow 5BR; "Signal Sentry"; Signal Slicer B, "Selector-Ject"; electronic key, John Bradley, General Delivery, Redwood City, Calif.

SELL: 2000 V, 500 mill power supply, \$75.00; modulator 810s with UTC VMS 600 watt, and Stancor A3765 input, \$60.00; Amtran 6200 V, CT 7000 mills, \$60.00. Also other items from K.W. transmitter. E. Seiler, Esder Bloomfield, N. V.

SWAP: New Polaroid camera for mobile gear. Arnold, Jr., W3YDF, Rich Hill Road, RD 1, Cheswick, Penna.

SWAP: Heathkit 0-8 'scope and Vomag VTYM for HQ-120X or equivalent. J. Lennon, 234 Drake Ave., New Rochelle, N. Y.

SELL: Viking II, \$250.00; National NC-183D receiver, \$270.00; both in excellent condx. Frank Schneider, K2EOA, 858 Kinsella St., Bronx, N. Y.

TRANSFORMER 3600 volt center-tap 450 Ma., \$20; BC-458, \$10.00; Cardwell XD-160-XS, \$3.00; Dynamic mike, \$5.00; BC-191 tuning unit, \$2.00; 72 ohm Ohmite dummy load, \$3.00; new 0-50 Ma. 3/4 square meter, \$3.25; T-17 microphone, \$1.00; BC-221 tuning capacitor, \$4.00; 329, \$3.00; crystals, capacitors, etc. Seidman, W2GNZ, 1355 Longfield, New York City, N. Y.

FOR Sale: W8HHU station, usually run 304TL at 675 watts, 810 Class B modulator and power supply. TVI suppressed 32V2 as driver, 75A3 receiver. Model 26 teletype with custom converter with 'scope tuning. Tel. 505, Minerva, Ohio. P.O. Box 217.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallicrafters, Hammarlund, Johnson, Lyco, Master Mobile, Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

SELL: NC183D rack model, like new. Viking I, factory TVI-suppressed, with Viking VFO: \$500.00 for all or best offer each. F.O.B. I. Werlin, 39 Coolidge Road, Medford 55, Mass.

CLEANING out equipment excess to my needs; books, magazines, parts, AM, CW, SSB ham equipment, phonograph, radio, amplifier, TV set. Stamp for list. Consider trades. W4API, Spitz, 1420 South Randolph, Arlington, Va.

WANTED: 75-200 watt xmitter in gud condx. Below \$125.00. Send description to: W7YQQ, 4521-46 Ne, Seattle, Washington.

SELL all band RF series 4-250A xmitter PI networks, rack mounting, fully shielded, turnkey VFO at \$225.00. Complete with tubes, power supply, chassis, Thordarson Multi-Match input and output, negative clipper filter, regulated bias supply \$135; heavy duty HV power supply, \$85; two finals, two 304TLs, each 10 inch; chassis 75 and 20, each \$40. Also SSB xtal filter, 150 watt xmitter complete, \$215. Many tubes, other parts. W1GR, A. W. Hyde, 77 Fairfield Road, Cranston, R. I.

VERTICAL Antenna: 20-40-80M. Aluminum construction. Material and instructions, \$69.50. El Cajon Electronic Engineering 720 So. Johnson Ave., El Cajon, California.

EX Signal Shifter, \$30; BC-459A, \$8.00; BC-453, \$8.00. One owner, with tubes, excellent condition. F.O.B. W9MLK, 315 Dix Road, Jefferson City, Mo.

WANTED: Used HQ-129X in gud condx. Will pay \$100.00. W1DIO 76 Austin St., New Britain, Conn.

SOLID NC183, ship-shape inside, respectable outside. Matched speaker, instruction manual: \$155. W2GTY.

COLLINS 75A2, factory installed, 3 Kc. mechanical filter, latest modification with GDC6 and crystal 100 Kc. calibrator. Used very little, in original carton. Best offer over \$300 F.O.B. Atlantic City, 2427 Boardwalk, Irv Fishelberg, W2ZLD, New Jersey.

FOR Sale: HRO-60 with coils and speaker, \$375.00; Johnson Matchbox, \$30.00; Webster Bandspeeder, like new, \$17.50; Cat. 600v, 170 M. dynamotor, \$15.00. W. R. West, P.O. Box 2423, Norfolk, Va.

FOR Sale or trade: Revere T-100 tape recorder, \$85; General Industries R-85L 2-speed disc recorder, \$22.50; portable mill, \$20.00; UTC LS-55 polypendancy output xfrmr, \$10.00; Truetime portable radio, \$10.00; Turner xtal mike, \$4.00; Amperite contact microphone, \$4.00; all excellent condx, priced F.O.B. V. R. Hein, 418 Gregory, Rockford, Ill.

FOR SALE: New & used Gonset mobile equipment, communicators, 2-meter amplifiers, etc. We buy, sell, exchange ham gear. Graham Co., Stoneham, Mass. ST 6-1966.

MODULATORS: Model 5000I Communications modulator for transmitters with up to 100 watts input. Complete with tubes, power supply and over-modulation indicator, \$94.50. Photo and technical data available upon request. Department A3, Amplex Radio Products, Inc., 1195 West Lake Drive, Walled Lake, Michigan.

NEW Crystals for all commercial services at economical prices; also regrounding or replacement crystals for broadcast, Link, Motorola, G-E and other such types. 20 years of satisfaction and fast service. Send for L-7 catalog. Eidson Electronic Co., Temple, Texas.

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TRADE: For men's golf clubs or guns. Fixed and mobile equipment. No Junk! Write needs and your offer to W5SPS.



WANTED: Collins 310 B-1 or 310 B-3 with coils and instruction book. Must be in excellent condx with only very minor alterations. State price and condx in your first letter. Sil Thompson, W5BUC, P.O. Box 1242, New Orleans, La.

COLLINS 32V3 with spare new RK4D32, \$550; RME VHF152A, \$35. Hi stability 5.0/5.3 Mc VFO with pwr supp. for SSB exciter, \$20.00; Telrad 100/1000 Kc frequency standard, \$100.00; Wille 1000 pwr induction motor blower (new), \$6.00. All F.o.b. or call for pre-ferred. Tom McCann, K2CM, 146 Hillcrest Ave., Morristown, N.J.

FOR Sale: Globe King 500, HT-18 Hallcrafters VFO and SX-88 and speaker. First \$925.00 received. Dr. C. J. Mahowald, Parshall, N. Dak.

COLLINS 32V-3, \$495; Hallcrafters SX-96 receiver, \$210 with R46A speaker, \$225.00; Hallcrafters SX-96 receiver, \$95.00; factory-wired 20A with QT-1, \$200.00; Elenco PA400 Linear amplifier, \$185.00; TBS-101, \$75.00; RME-MC55 mobile converter, \$35.00. Everything A-1 in original cartons. Oser, WIRMS, 198 Euclid Ave., Watbury, Conn.

SELL Vixing II and VFO, spare pairs 807s and 6146s, small hand crystal mike, all in perfect condition. Price: \$249.00. This rig made phone DXCC in one year. Will deliver within 50 miles. K2CJN, Steve Mann, 192 Staab Lane, Westbury, Long Island. Phone: EDgewood 3-3845.

FOR Sale: HQ-129X, less speaker, in excellent condition, \$140.00. Millen R9er with 10 and 20 meter coils, \$15.00. Doug Smith WIUKO, 8 Arcadia Rd., Natick, Mass. Phone OL 3-3748.

SELL: SX-25 receiver, exterior is in excellent condition. Needs work internally. \$40.00. W9WUDU, 1536 George St., La Crosse, Wis.

BC348Q and accessories, \$55.00. In excellent condition. W. C. Petrie, W02WU, 3821 Old Marion Rd., Cedar Rapids, Iowa.

BARGAIN Day at WIRMI: Sale HQ-129X, \$115; \$200 each; PE-135 dynamotor complete (filter case, new, in crate); 600V 200 Ma, 300V 75 Ma pwr supply; pair of 61.6 AB2 40-watt modulator, National CRU modulation monitor 'scope; Heathkit V-6 VTVM, Grid Dip I-B Box 183, Greenbush, Mass. Telephone Scituate 1068-J.

AR-FIVE Company standing wave bridges and 6-meter gear. SW-500 measures SWR on coax continuously with outputs 20 to 500 watts, \$16.95; CV-6 converter, cascade RF, crystal oscillator, 10-14 Mc, output to receiver, \$27.95. Any other output 7-30 Mc, \$29.95. TX-620 transmitter, 20 watts, fixed modulator, phone/CW, many other features, \$64.95. Less tubes, \$54.95. Power supplies for above available wired or kits. Soon, 2-meter equipment, many other items. Custom building a specialty. All letters answered. Write now! Jim, Custom Building, W9BMR & Ed, W4FFW/9, ex-W2QNZ, Ar-Five Company, Box 335, Shullsburg, Wis.

OSCILLOSCOPE. Dumont: 304A, \$175.00; 274A, \$60.00, used, like new. Request details. M. Brownstein, W3GKO, 4653 Boudinot St., Phila. 20, Pa.

FOR Sale: 200 watt TVI suppressed cw xmtr, pwr supply, VFO, antenna tuner. Like new. BC-348Q, I-S-3 speaker, 28 Mc converter. All for \$150.00. Will separate. Chas. Dutton, W9QLK, Rte 3, Box 99, Elgin, Ill. Phone: ELgin 7402.

SELL: 19 Mark II, complete manual, control boxes, mike and cables; BC-342 110 AC in excellent condx; transformer 1710 V at 800 ma; brand new 1952 Studebaker rider in original carton. Best offer. Peter Waaslorp, 311 Byram Shore Road, Byram, Conn.

WANTED: Hallcrafters SR-75 transceiver in good condition. L. F. Megaw, W5PY, Box 296, Zapata, Texas.

NEW ICA Deluxe Signatone Cde Oscillator (Reg. \$15.75). Special, \$7.95. Key, \$1.35 extra. Surplus RG-8 U cable, 100 ft., \$5.95, 250 ft., \$13.25, 500 ft., \$25.00. Free Bargain Bulletin. Visit store for unadvertised bargains. Lectronic Research, 719 Arch St., Philadelphia, 6, Pa.

PASS Amateur theory exams. Check yourself with sample FCC-type questions and Novice and General class examinations. All for only \$9.95. Arco Electronics, 1203 Bryant Ave., New York 59, N.Y.

COLLINS 800 cycle filter, \$15.00. W2FZM, LaDage, 431 Oakland, Maple Shade, N. J.

HOUSE Cleaning time on Mockingbird Hill II: 500 watt final and modulator, BC-453 made up for SSB slicer operation, Q multiplier, antenna 'scope, BC458, SWR bridge, Hickok 534, Dumont 208 Wincharger tower 125 ft., miscellaneous, list. C. C. Richelieu, W8JS, 3536 Vista Ave., Cincinnati 8, Ohio.

COLLINS 32V3 for sale, in excellent condx like new, \$500.00. No trades. Set of B&W 150 watt swinging link BVL type coils for 80, 40, 20 and 10 meters. Don DeShazo, Jr., W9WVC, 529 Blackstone Ave., La Grange, Ill.

\$700 value. Complete station in excellent condition: Viking II with VFO and push to talk D104 microphone; SX71 receiver; TR-4 rotator and 15 mtr. beam: \$490.00. F.o.b. uncrated. Syl Polunsky, W5TGT, 915 Classen, San Angelo, Texas.

BOOK Sale: Principles & Practices of Telecasting Operations, Ennes, \$4.00; Television for Radiomen, Noll, \$4.00; Radio Engineering, Terman, \$4.50; Radio Engineering Handbook, Henney, \$5.50; High Frequency Measurements, Hull, \$3.00; Electronics Dictionary, Cook & Marzke, \$3.00 each; Practical Radio Communication, Nilson & Hornung (2 copies, \$4 each); Mathematics for Electricians & Radiomen, Cooke, (5 copies, \$2.50 each); Fundamentals of Vacuum Tubes, Eastman, \$3; The Radio Manual, Fundamentals of Communication, Albert, (3 copies, \$5.00); Electrical Fundamentals of Communication, Albert, (3 copies, \$3.00 each). All books like new and in perfect condx. Prices are postpaid. All books \$50 for entire lot. All inquiries answered. W. Cook, 1614 Morson Rd., Jackson 9, Miss.

WANTED: Amateur and aircraft receivers, transmitters, direction finders. Especially APR-4, APR-5, ARN-7, ARC-1, ART-13, BC-610, BC-939, BC-348, teletype, BC-221; 32V, 75A. Test equipment. 610, BC-939, BC-348, teletype, BC-221; 32V, 75A. Test equipment. Cash or trade for New Johnson Viking, Ranger, Central Electronics, Hallcrafters, Hammarlund, National, B&W, Gonset, Elmac, Har-vey-Wells, Morristown, N.J., Fisher Hi-Fi, etc. Write: Altronics, Box 19, Boston 1, Mass., Richmond 2-0048 (Stores: 44 Canal, Boston 60 Spring, Newport, R. I.).

WANTED: 304TL & TH; 6184/6A26, FG95, 5560, 1295, W1632, H755A, Klystrons, Magnetrons, all Western Electric and Sperry tubes. Selenium rectifiers and plates. Lo voltage hi capacity electrolytics, 2000 µfd and up, 50 volts operating. "TAB", 111 Liberty St., N. Y. 6, N. Y. Tel. RE 2-6245

PERFORATED Aluminum sheet, .051, 5/64" OD Holes, 3/4" centers, \$1.20 sq. ft.; cut to size. Send for listing on beams, aluminum tubing, etc. Radcliff's, Fostoria, Ohio.

USED equipment available from the largest inventory of this type in the East. Here are a few samples: Gonset 10-11 converter, \$24.95; Triband, \$29.95; 300W, \$24.95; Super-ceiver, \$89.95; Hallcrafters S-22R, \$39.95; S-38, \$29.95; SX-43, \$129.95; SX-62, \$250.00; SX-96, \$199.95; HT-20, \$150.00; Johnson Mobile, \$249.95; Viking I with push-to-talk, \$199.95; Viking I TVI-suppressed, \$249.95; Ranger, \$215.00; VFO, \$44.95; Viking II, \$275.00; National HF5, \$99.95; HRO-M, \$99.95; HRO-501, \$350.00; HRO-5TA1, \$175.00; NC-46, \$59.95; NC-88, \$89.95; NC-100N, \$75.00; NC-183D, \$295.00; SW-54, \$34.95; Collins 32V1, \$395.00; 32V2, \$450.00; 32V2, modified, \$495.00; many others. For latest complete list write Carl, WIBFT, Evans Radio, Concord, N. H.

SELL: Collins 75A-2, \$295; 310C, \$125.00; Dumont #241 'scope, \$225; 32V2, \$195.00; 12,000 ohm relays, 110 VAC dials, \$1.75; Teletype equipment, Collins 301, \$275.00; Waco APR-4 receiver and tuning units, ARN-7, ART-13, Tom Howard, WIAFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. Richmond 2-0916.

FOR Sale: Radio Craft-Radio Electronics, 1947; Sept.; 1948, Feb.-Oct.; 1949, Jan., Feb., March, April, May, June, July, Aug., Dec.; 1950, Jan., Feb., March, April, May, June, July, Aug., Dec.; 1951, Feb., Nov., Dec.; 1952 and 1953, all 12 issues. Some have torn covers but all are complete. Radio News-Radio & Television News, 1944, Jan., Mar., June, Sept., Oct., Nov.; 1945, June, Aug., Dec.; 1946, Jan., Nov., Dec.; 1948-1951 incl., every issue except Dec. CO; 1947, Aug., Oct., Dec.; 1948, Jan., Feb., March, April, May, June, July, Aug., Oct., Dec.; 1949-54 incl., every issue except Dec. CO; 1955, Jan., July. Perfect condition. 20¢ per copy. Cecil G. Baumgartner, Box #43, Milton, Penna.

TROUBLE Getting out? Put a punch in your signal the easy low-cost way. Look! Loopen wire folded dipole antennas. \$4.95 and up. Write for free literature. R. J. Buchan Co., Briceley 4, Minn.

ELECTRONIC Blanket controls, 3 tubes, filament transformer, plate relay, resistors and condensers, in plastic case with cord, \$2.50 each postpaid. Dozen lots, \$2.00 each postpaid. John Randolph, W4QA, P.O. Box 2158, Asheville, N. C.

SELL: RME VHF2-11 asherhet 14 tubes for 2-6-10-11, excellent, \$65.00; Link police car transmitter, untouched, excellent, \$30.00; Stancor ST-202-A table top CW 100 watt package complete. Pictures. Brush tape recorder HK-401, excellent, \$100.00; Collins 32V2 including FM adaptor, exciter, \$465.00; modulator chassis 500 watt including two 810s, bargain, \$5.00. W2ADD.

AC Generators and plants, Katolight, Winpower and Pioneer. Discounts to amateurs and CD. E. T. Ballou, WIGED, Box 224, Wayland, Mass.

FOR Sale: Kilowatt transmitter 2-30TLs, final 2-304TLs, modulator 2 Hi-Voltage power supplies; Lambda Modulation 'scope, exciter and speech amplifier, Supreme AF-100 with 4-65A output. Pictures on request: \$495.00. Also have for sale Johnson Ranger, in like new condition. Less than a year old: \$195.00. Col. M. B. Chatfield, Redstone Arsenal, Huntsville, Ala.

MODERNIZE Now! Highest trade-in allowance ever offered. Top-notch used equipment at lowest wholesale prices anywhere. Write right now about any gear you want, new or used. Marshall Electronics, 855 Burlington, Frankfurt, Indiana.

WANTED: Monoscope tube, any age. Pat Blaney, New Straitsville, Ohio.

COLLINS 310B-1 exciter VFO, all bands, \$165.00; National NC-183 receiver, NFM-83, speaker, recently factory-serviced, \$175.00; Select-O-Ject, power supply, \$18.50; Meissner signal shifter TVI suppressed, coils, \$20.00; loads panel meters, tubes, filter chokes and condensers, small, medium power transformers. Everything in top condition. F.o.b. Indianapolis. Request free details listing. Howard Severid, W9DPL, 2431 E. Riverside Dr., Indianapolis 23, Ind.

COLLINS 32V-3 in excellent condition, \$525.00. George Sperry 108 Oak Hill, Portsmouth, Va.

FOR Sale: Bendix TA-12, 150 watt transmitter and AC power supply, VFO, handswitching, 20-40-80 meters, Pi network output, TVI suppression, \$50.00. W0ATP, Thelemann, 6210 W. 76th Place, Overland Park, Kansas.

SHACK-CLEARING sale: 40-foot steel windmill tower, \$40.00; SHACK-100, 10-meter beam, \$20.00; PE-103, kilowatt coils, \$2.00 each; 2500, 5-volt 10-amp, 12,000 volt insulated blank new in crate, \$25.00; 304-TL, \$3.00; BC-455, \$5.00; 6VDC generator, \$18.00; Viking Matchbox, \$17.00; everything in perfectly new condx. W00MH, R.F.D. #2, Hastings, Nebraska.

SELL: 300 W. Meissner 50B transmitter, 80 thru 10M, complete with VFO CW-Phone, time delay relays, B&W coil, \$220.00. Re-ceiver NC-100ASD, 1400 Kc. to 30 Mc., \$50.00; HE-10 & 20, \$50.00. W4PKR, Valleau, Princeton, Ky. Tel. 2689-2247.

WANTED: Panadaptor, Hallcrafters SP-44 or Panoramic. Mel Malley, W0SRU, 2251 Depew St., Edgewater, Colo.

FOR Sale or trade: S40A, Gonset, 3-30 converter, Balun coils, Kodak Pony 135; Need: Johnson Matchbox, W0RFL, 345 W. 9th St., Fremont, Neb.

SELL: Heathkit AT-1 transmitter, antenna coupler and VFO, \$50.00. Alan Steger, K2SVH, Box 97, Huntington Station, N. Y.

RADIO Club needing 16 mm sound movie projector with complete accessories. Can obtain rebuilt machine at big bargain from professional movie machine operator. ARRL member. Contact: Projectionist, Unique Theatre, 3645 East 1st St., Los Angeles 63, Calif.

WANTED: BC-610E, BC-614E, BC-939, BC-312, BC-342, JB-60 & 70. Highest price paid. USECO, 2811-16th Street NE, Washington 18, D.C.

FOR Sale: Perfect working condition: TVI-suppressed, commercially built 500 watt phone c.w. xmtr, complete with 866s splitter suppressor, variac-controlled power supply, modulator (pair 811As), Miller 90991 final (812As); Millen 90800 exciter, all in new deluxe 6 ft. locked door Par-Metal cabinet, with rack on casters. Plug-in coils, all bands, also Collins VFO 310C2 with built-in power supply. Stromberg-Carlson speech amplifier and Harrison 500 watt antenna tuner with all coils. First bid \$460.00. W1UWB, Julian Sobin, 83 Arnold Rd., Newton Center 59, Mass.

FOR Sale: Hammarlund SP-400N in like new condx: \$250. Dr. Stephen R. Fromm, 35 Revere St., Boston 14, Mass.

WANTED: Complete used 12 v. mobile rig in gud condx or used Gonset Communicator. Contact Ronnie Gann, W1FGF, c/o ARRL, 38 LaSalle Rd., West Hartford 7, Conn.

QDP? Use Stick-Tack. See page 141. The Radio Stationers.

COLLINS 32V3, little used. \$500 F.o.b. KH6JJ.

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- Superb performance on SSB



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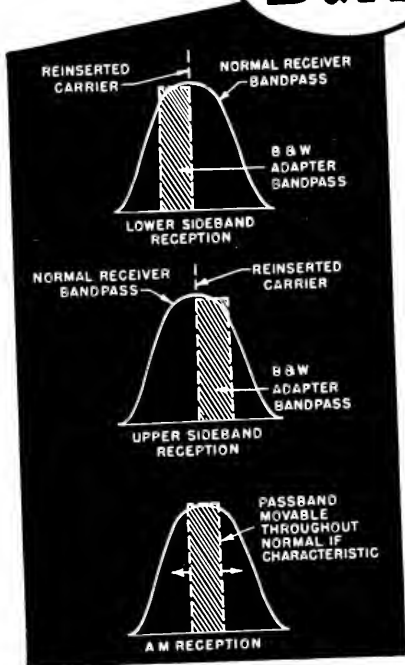
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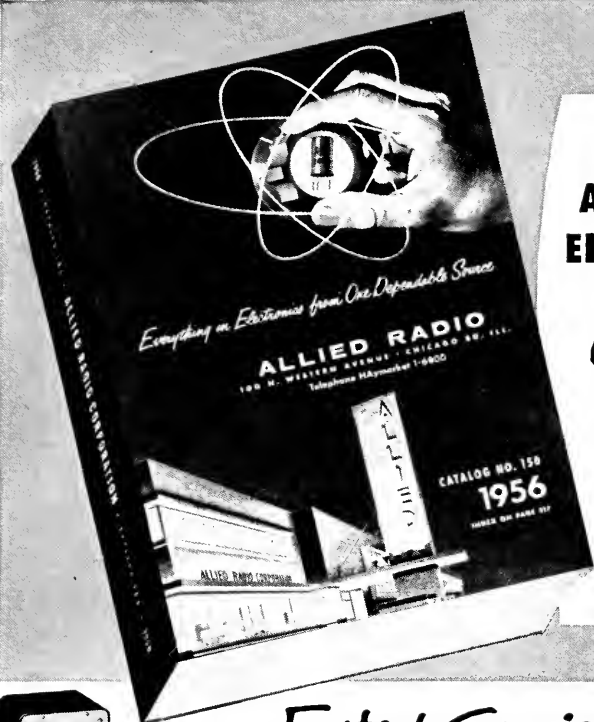
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Distributors everywhere unveil the

## NC-300 dream receiver



Now see and hear for yourself the first receiver especially built to include all the features hams want most—at a price most hams are willing to pay! The NC-300 will be at your distributors FRIDAY, SEPTEMBER 30! Coast-to-coast, it's NC-300 Day.

Thousands of different suggestions were carefully considered in the contest National sponsored to find out what hams wanted most in a receiver. And this receiver—the NC-300—is precision-built to include the most wanted features asked for among the thousands of suggestions received!

You must see the NC-300. For back of this "dream receiver" is the solid guaranty of National's 41-year reputation as pioneers in receiver design and production.

Ham history is being made on FRIDAY, SEPTEMBER 30. Mark the date. Be sure to be at your distributors.



*tuned to tomorrow*

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**Here are  
just a few  
of the many  
new features**

No greater sensitivity in any ham receiver at any price (3-6db noise figure on all amateur bands) plus... greater stability than most receivers costing up to \$695.

NEW! Features a total of 10 dial scales for coverage of 160 to 1 1/4 meters with National's exclusive new converter provision with the receiver scales calibrated for 6, 2, 1 1/4 meters using a special 30-35 mc tunable IF band.

NEW! Longest slide rule dial ever! More than a foot long! Easily readable to 2 kc without interpolation up to 21.5 mc.

NEW! 3 position IF selector—.5 kc, 3.5 kc, 8 kc—provides super selectivity, gives optimum band width for CW, phone, phone net or VHF operation.

NEW! Separate linear detector for single sideband...decreases distortion by allowing AVC "on" with single sideband...will not block with RF gain full open.

NEW! Hi-speed, smooth inertia tuning dial with 40 to 1 ratio! Provides easier, more accurate tuning. Smoothest dial you've ever used.

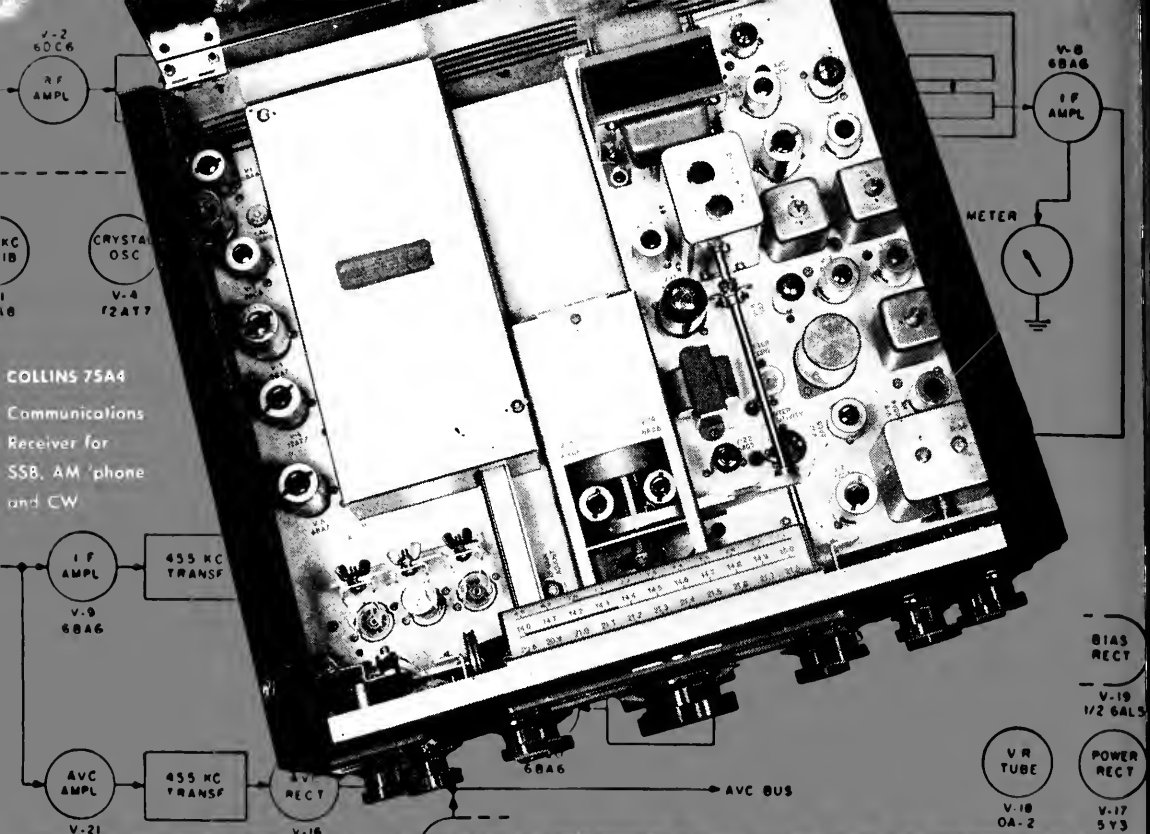
NEW! Exclusive optional RF gain provision for best CW results allows independent control of IF gain!

NEW! Giant, easy to read, "S" meter!

NEW! Provision for external control of RF gain automatically during transmitting periods.

NEW! Muting provision for CW break-in operation.

PLUS—the newest look in ham receivers... "Massive in the modern manner"...truly a "dream receiver" that can be used either as a table or rack model!



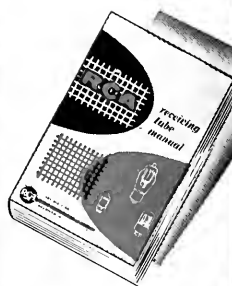
# LEADING AMATEUR DESIGNS ...USE RCA TUBES



Take the Collins 75A4, for example. Known by radio amateurs for its high signal sensitivity and operating stability, this versatile receiver uses RCA Receiving Tubes to assure maximum circuit performance from the input to the output.

Here are reasons why leading amateur and commercial designers specify *RCA Receiving Tubes*: RCA Tubes are known for their background "quietness"—a feature that provides a lower noise threshold and enables you to boost receiver sensitivity. RCA Receiving Tubes have high uniformity of characteristics, can be "interchanged" without a lot of circuit "fussing"—no matter where or when you buy your tubes. And RCA Receiving Tubes "stand the gaff" of on-air operations; you can plug them in and then forget them!

There is an RCA Receiving Tube for virtually every receiver and transmitter application in amateur radio. See your RCA Tube Distributor for the types you need. For technical data, write RCA, Commercial Engineering, Section I37M, Harrison, N. J.



## New RC-17 RCA Receiving Tube Manual

Revised, up-to-date technical reference on RCA Receiving Tubes. Includes basic tube theory, installation and operations data, application help, charts, circuits. A "must" reference for every ham shack. Only 60 cents, from your RCA Tube Distributor.



**RADIO CORPORATION of AMERICA**  
ELECTRON TUBES

HARRISON, N.J.



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October 1955

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# amateur radio



PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE



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# HIGH FIDELITY TRANSFORMERS

FROM STOCK... ITEMS BELOW AND 650 OTHERS IN OUR CATALOGUE B.



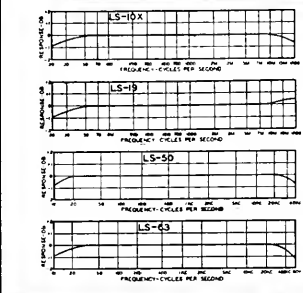
### TYPICAL UNITS

#### LINEAR STANDARD series

Linear Standard units represent the acme from the standpoint of uniform frequency response, low wave form distortion, thorough shielding and dependability. LS units have a guaranteed response within 1db. from 20 to 20,000 cycles.

Hum balanced coil structures and multi-pole alloy shielding, where required, provide extremely low inductive pickup.

These are the finest high fidelity transformers in the world. 85 stock types from milliwatts to kilowatts.



**LS-10X Shielded Input**  
Multiple line (50, 200, 250, 500/600, etc.) to 50,000 ohms ... multiple shielded.

**LS-19 Plate to Two Grids**  
Primary 15,000 ohms.  
Secondary 95,000 ohms C.T.

**LS-50 Plate to Line**  
15,000 ohms to multiple line ... +15 db. level.

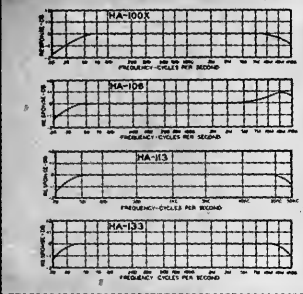
**LS-63 P.P. Plates to Voice Coil**  
Primary 10,000 C.T. and 6,000 C.T. suited to Williamson, MLF, ul-linear circuits.  
Secondary 1.2, 2.5, 5, 7.5, 10, 15, 20, 30 ohms. 20 watts.



CASE	LS-1	LS-2	LS-19
Length	3 1/4"	4-7/16"	5-13/16"
Width	2 3/4"	3 1/2"	5"
Height	3 1/4"	4-3/16"	4-11/16"
Unit Wt.	3 lbs.	7.5 lbs.	15 lb

#### HIPERMALLOY series

This series provides virtually all the characteristics of the Linear Standard group in a more compact and lighter structure. The frequency response is within 1 db. from 30 to 20,000 cycles. Hipermalloy nickel iron cores and hum balanced core structures provide minimum distortion and low hum pickup. Input transformers, maximum level +10db. Circular terminal layout and top and bottom mounting.



**HA-100X Shielded Input**  
Multiple line to 60,000 ohm grid ... tri-alloy shielding for low hum pickup.

**HA-108 Plate to Two Grids**  
15,000 ohms to 135,000 ohms in two sections ... +12 db. level.

**HA-113 Plate to Line**  
15,000 ohms to multiple line ... +12 db. level ... 0 DC in primary.

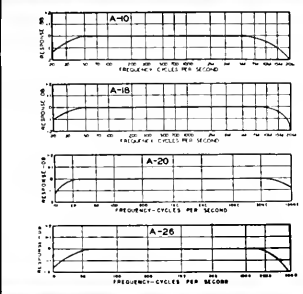
**HA-133 Plate (DC) to Line**  
15,000 ohms to multiple line ... +15 db. level ... 8 Ma. DC in primary.



CASE	H-1	H-2
Length	2 3/4"	3-9/16"
Width	1-13/16"	2-13/16"
Height	3 1/4"	3 1/2"
Unit Weight	2 lbs.	5 lbs

#### ULTRA COMPACT series

UTC Ultra Compact audio units are small and light in weight, ideally suited to remote amplifier and similar compact equipment. The frequency response is within 2 db. from 30 to 20,000 cycles. Hum balanced coil structure plus high conductivity die cast case provides good inductive shielding. Maximum operating level is +7db. Top and bottom mounting as well as circular terminal layout are used in this series as well as the ones described above.

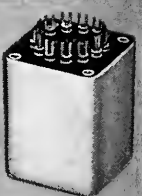


**A-10 Line to Grid**  
Multiple line to 50,000 ohm grid.

**A-18 Plate to Two Grids**  
15,000 ohms to 80,000 ohms, primary and secondary both split.

**A-20 Mixing Transformer**  
Multiple line to multiple line for mixing mikes, lines, etc.

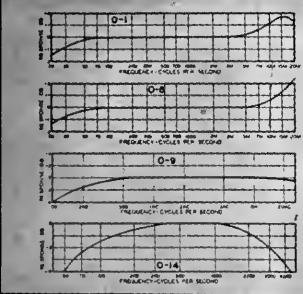
**A-26 P.P. Plates to Line**  
30,000 ohms plate to plate, to multiple line.



A CASE	
Length	1 1/4"
Width	1 1/8"
Height	2 1/2"
Unit Weight	7/8

#### OUNCER series

UTC Ouncer units are ideal for portable, concealed service, and similar applications. These units are extremely compact ... fully impregnated and sealed in a drawn housing. Most items provide frequency response within 1 db. from 30 to 20,000 cycles. Maximum operating level 0 db. These units are also available in our stock P series which provide plug-in base. The O-16 is a new line to grid transformer using two heavy gauge hipermalloy shields for high hum shielding.



**O-1 Line to Grid**  
Primary 50, 200/250, 500/600 ohms to 50,000 ohm grid.

**O-8 Plate to Two Grids**  
15,000 ohms to 95,000 ohms C.T.

**O-9 Plate (DC) to Line**  
Primary 15,000 ohms, Secondary 50, 200/250, 500/600.

**O-14 50:1 Line to Grid**  
Primary 200 ohms, Secondary .5 megohm for mike or line to grid.



OUNCER CASE	
Diameter	7/8"
Height	1-3/16"
Unit Weight	1 oz.

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**LAST YEAR'S WINNER.** Benjamin S. Hamilton, W6VFT, is congratulated by Val Peterson, right, Administrator, Federal Civil Defense Administration. J. Milton Lang, general manager of the G-E Tube Department, looks on.



# NOMINATIONS NOW OPEN FOR 1955 EDISON AWARD

The Fourth Annual Edison Radio Amateur Award will give you an opportunity to recommend for high honors an amateur who has rendered important public service.

Handsome trophy, a \$500 check, and coast-to-coast recognition await the 1955 winner. The panel of judges will consider only candidates nominated by letters from you and others.

Start now to make your selection and assemble the facts for your nominating letter. Read the Award Rules at right!

Radio amateurs and their friends are generous in acclaiming accomplishment. No better means for this exists than for you to name . . . soon . . . a candidate for the Edison Award.

Send your letter to *Edison Award Committee, General Electric Company, Tube Department, Schenectady 5, N. Y.*

## RULES OF THE AWARD

**WHO IS ELIGIBLE.** Any man or woman holding a radio amateur's license issued by the F.C.C., Washington, D.C., who in 1955 performed a meritorious public service in behalf of an individual or group. The service must have been performed while the candidate was pursuing his hobby as an amateur within the continental limits of the United States.

**WINNER OF THE AWARD** will receive the Edison trophy in a public ceremony in a centrally located metropolitan city. Expenses of his trip to that city will be paid.

**\$500 GIFT.** Winner will be presented with a check for this amount in recognition of the public service he has rendered.

**WHO CAN NOMINATE.** Any individual, club, or association familiar with the service performed.

**HOW TO NOMINATE.** Include in a letter the candidate's name, address, call letters, and a full description of the service performed. Your letter must be postmarked not later than January 2, 1956.

**BASIS FOR JUDGING.** All entries will be reviewed by a group of distinguished and impartial judges. Their decisions will be based on (1) the greatest benefit to an individual or group, (2) the amount of ingenuity and sacrifice displayed in performing the service. The judges will be:

**E. ROLAND HARRIMAN**, President, The American Red Cross.

**HERBERT HOOVER, JR.**, The Under Secretary, U. S. Department of State.

**EDWARD M. WEBSTER**, Commissioner, Federal Communications Commission.

**GOODWIN L. DOSLAND**, President, American Radio Relay League.

Winner of the Award will be announced on or before Thomas A. Edison's birthday, February 11, 1956.

Employees of the General Electric Company may nominate candidates for the Edison Radio Amateur Award, but are not permitted to receive the Award.

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latest in the 75A series  
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**COLLINS RADIO COMPANY, Cedar Rapids, Iowa**



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# why is the **SX-96** the most wanted receiver on the air?

The Hallicrafters double conversion selectable side band receiver offers major improvements in stability by the addition of temperature compensation in the high frequency oscillator circuits and the use of crystal controlled second conversion oscillators. Hallicrafters highly selective 50 kc i-f system is used in this new precision-built receiver.

**Coverage:** Standard Broadcast, 538-1580 kc; Three S/W Bands, 1720 kc-34 Mc, Band 1: 538 kc-1580 kc-Band 2; 1720 kc-4.9 Mc-Band 3: 4.6 mc-13 mc-Band 4: 12 mc-34 mc.

**Type of Circuit:** Double conversion superheterodyne over the entire frequency range.

**Type of Signals:** AM-CW-SSB.

**Features:** Precision gear drives are used on both main tuning and band spread dials. Double conversion with selectable crystal controlled second oscillators. Selectable side band reception of both suppressed carrier and full carrier transmissions by front panel switch, delayed AVC, CW operation with AVC on or off. Calibrated bandspread, "S" meter, low drift, double conversion superhet.

**Controls:** Sensitivity, band selector, volume, tuning, AVC on/off, noise limiter on/off, AM/CW-SSB, Bandspread, selectivity, pitch control, response (pwr on/off, LSB, USB-2 tone pos.), receive-standby.

**Intermediate Frequencies:** 1650 kc and 50 kc.

**Tuning Assembly and Dial Drive Mechanism:** Separate 3 section tuning capacitor assemblies for main tuning and bandspread tuning. Circular main tuning dial has 0-100 logging scale. Bandspread dial is calibrated for the 80, 40, 20, 15, and 11-10 meter amateur bands.

**Selectivity:** Five steps of bandwidth calibration at 6 db points; 5 kc, 3 kc, 2 kc, 1 kc, and .5 kc.

**Antenna Input Impedance:** Balanced/unbalanced.

**Headphone Output Impedance:** Nominal 500 ohms.

**Audio Output Impedance:** 3.2/500 ohms.

**Automatic Noise Limiter:** Series noise limiter operated by toggle switch on front panel.

**Carrier Level Indicator:** Calibrated in "S" units from 1 to 9, decibels to 90 db over S9, microvolts from 1 to 1000 k.

**External Connections:** 3.2/500 ohm speaker terminals, terminals for single wire or double antenna, phono jack, AC power cord, socket for DC operation and remote control, audio output terminals, "S" meter electrical adjustment and mounting hole for co-axial cable connector. Phones jack on front panel.

**Audio Power Output:** 1.5 watts with 10% or less distortion.

**Power Supply:** 105/125 V, 50/60 cycle AC.

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Matching R-46B Speaker-\$17.95

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## Section Communications Managers of the ARRL Communications Department

**Reports Invited.** All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RA1 and PAM where vacancies exist. All amateurs in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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Here's a transmitter that's built to give you greater performance . . . greater dependability. And the HT-30 guarantees you greater enjoyment because it incorporates all these wanted features . . .

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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# "It Seems to Us..."

## "IN THE PUBLIC INTEREST . . ."

We write this just a week after a flood disaster ravaged our Northeast, still aghast at the tragedy of loss of life and property, yet with a growing feeling of pride in being a member of the body of amateur radio which did such a magnificent job of providing vital emergency communication.

This brief tribute will be woefully incomplete. In the true tradition of service, amateurs have been too busily engaged in disaster work to take time out to inform Hq. of their many accomplishments. Yet our own experience, even though limited almost entirely to the two spot frequencies housing the Connecticut 'phone and c.w. nets, makes it thoroughly evident that amateurs throughout the disaster areas banded together in the public interest, convenience and necessity, whether they wore c.d. armbands and manned the Radio Amateur Civil Emergency Service organization, or served strictly as amateurs in the various section and regional nets. A full week after the first alert, many are still at their posts, exhausted from endless hours at key or mike, hanging on because of the importance of the job being done.

In general amateur communications worked smoothly despite the confusion which Nature foisted on us all. Net discipline was good, station coöperation excellent. Amateurs by the hundreds, not in the immediate flooded areas, must have been standing by hour after hour to offer assistance if and when needed, and we'd like to observe that one good measure of the efficiency of disaster communication is the number of stations standing silently by. The key was teamwork, the aim to get the job done.

Teamwork and efficiency it was. In one instance W1AW had a circuit to a station in a hard-hit area for most of four days without knowing just where he was located, what kind of power he was using, or even his name, and when the press made inquiries for such information we were not ashamed to profess ignorance — there just wasn't time for such details. In another instance, few if any amateurs handling official disaster traffic to and from one civil-defense installation knew of the heroic performance of its operator — his

house had been washed away and his mother drowned, yet as an amateur his first thought was to fight his way to c.d. headquarters to provide the town with urgently-needed communication.

*QST* wants to record the performance of the amateur body in the Great Flood of 1955, and we solicit your help in providing information to that end, whether it be an outstanding story of personal or group sacrifice and accomplishment, or the mere fact that you were standing by to help if needed. Then there is one more job to be done. We must all admit there were occasional foul-ups in our operations, just as there were in all flood-fighting activities. As will undoubtedly be done by other agencies wanting to profit by the tragedy of experience, we should examine our own performance to determine how next time — and there will be a next time — we can be even better prepared.

## THE REASON WHY

From time to time most of us have occasion to explain amateur radio to BCLs. It isn't too hard to tell them how we establish contact with another ham, nor to answer the perennial question "How far can you talk with that thing?" — perhaps with a slight exaggeration! More difficult to explain is the fascination which keeps us active year after year, which makes us stay up all night calling "CQ SS" or chasing DX.

One of the best descriptions of our hobby was written not by an amateur but by a sociologist who had picked amateur radio as an example of an American institution which had gone from its earliest beginnings to a respected position in the Twentieth Century. In his doctorate thesis the sociologist, Dr. Raymond V. Bowers of Yale University, asked himself "What are the elements of this core complex in the amateur radio institution?", then proceeded to answer in this fashion:

The central trait is the means of communication with others on equal terms, of finding friendship, adventure and prestige while seated at one's own fireside. In picking his human contacts out of the air the amateur is not seen by them. . . . He is not known by the company he keeps nor by the clothes

he wears but by the signals he emits. He enters a new world whose qualifications for success are within his reach. A good home-made set gives him more prestige than a commercially-manufactured one. There are no century-old class prejudices to impede his progress. He enters a thoroughly democratic world where he rises or falls by his own efforts. When he is W9XYZ, a beginner, the radio elders help him willingly, and when he becomes W9XYZ the record-breaker and efficient traffic handler, he willingly helps the younger generation. Without a pedigree, a chauffeur, or an old master decorating his living room he can become a prince — of the air. At the close of the day, filled with the monotonous routine of the machine age, he can find adventure, vicarious travel, prestige and friendship by throwing in the switch and pounding his signals into the air.

Though this was written over twenty years ago, it still expresses the attractions that call us to our hobby today. Though perhaps the game has become more complicated, a new and friendly world still opens its arms in welcome whenever the rig is fired up and a good fist or well-modulated voice sends out a CQ.

## A.R.R.L. CONVENTIONS

### CENTRAL DIVISION

*South Bend, Ind. — Oct. 15th-16th*

Typical "Hoosier Hospitality" will be extended to all amateurs and friends attending this Convention. The Hotel Oliver will be headquarters, although other fine hotels in the city will share in the accommodations for guests. Rates are moderate, and a special discount of 25 per cent is offered to conventioners.

The program will be of interest to amateurs in every phase of operating, be it s.s.b., v.h.f., DX, MARS, or what have you. Even the Novice hasn't been forgotten. There will be lectures and demonstrations of general interest and again, these features will be headed by the top men in their fields. There will be a banquet on Saturday night, with a nationally-known speaker and headline entertainment. The mobile enthusiast will find plenty of activity to attract his attention, and of course there will be an initiation into the Royal Order of Wouff Hong at midnight on Saturday.

Has the XYL been forgotten? No, Sir! Plans for her entertainment are high in priority. XYL activities are being planned by XYLs, and many activities outside of ham radio will make her stay as pleasant as possible. A handsome gift will be presented to each lady registering.

The registration fee is \$3.50 in advance and \$4.00 at the door. Advance registrations close to October 7th, and the committee will take care of your housing arrangements, too!

Remember, the committee is determined to have good fellowship and fraternalism as the theme. The program is designed for you to have fun, with just the right balance of serious discussion, technical talks, and entertainment. You will have a complete program, and you can relax too!

Don't forget the address! It's Central Division Convention, Box 551, South Bend, Ind. Make all checks payable to the Central Division Convention. See you there?

### MIDWEST DIVISION

*Omaha, Nebr. — Oct. 22nd-23rd*

The Ak-Sar-Ben Radio Club will be host this year to the Midwest Division at Omaha on October 22nd and 23rd. Those who have attended previous doings out this way know that every one is better than the last, and this one will be no exception. There will be an impressive array of speak-

ers that you won't want to miss, and that "once-a-year" opportunity to visit with all of the old gang. A social hour and a 'teen party have been scheduled as well as YL and XYL activities. The most important part hasn't been forgotten either — the food will be good and there will be plenty of it. For reservation information write P. O. Box 626, Omaha, Nebr.

## OUR COVER

This month's cover shows a close-up view of the 4-65A final and its tank assembly in "A Modern Medium-Power Transmitter." The rig was designed and built by Richard Egbert, ex-W2QMO, and features complete break-in with special attention paid to keying characteristics. Primarily a c. w. rig, its power output and ease of operation should make it a hit with the contest and traffic man. For further details, see this issue's lead article.

## FEDERAL COMMUNICATIONS COMMISSION

*Washington 25, D. C.*

Editor, QST:

Because it concerns a rule which appears to have been widely misunderstood as to its correct application, we are requesting your cooperation in giving publicity to this letter.

Section 12.113 of Part 12, Rules Governing Amateur Radio Service, specifies that: "Sideband frequencies resulting from keying or modulating a carrier wave shall be confined within the authorized amateur band." This applies to all amateur frequency bands allocated for telephony emissions. Radiation of normal or spurious sideband frequencies, resulting from modulation, outside the amateur telephony bands is in violation of Section 12.113 regardless of whether such radiation is on frequencies allocated to the Amateur Service or to other radio services.

Questions as to what operating carrier frequency near the edge of a telephony band would assure that transmissions would be in compliance with Section 12.113 cannot be answered in terms of a specific carrier frequency. Obviously, the characteristics of the voice modulating the transmitter and the operational characteristics of the transmitter itself determine the bandwidth of emission. At the present time, it is believed that the exact specification of allowable bandwidths for amateur telephony together with the necessary specification of measuring equipment and techniques would introduce unnecessary and, therefore, undesirable complications of the Amateur Rules.

It is the responsibility of each operator of an amateur station to make sure that the operation of his station is within the requirements of Section 12.113. That part of Section 12.133 which states that "This spurious radiation shall not be of sufficient intensity to cause interference in receiving equipment of good engineering design including adequate selectivity characteristics, which is tuned to a frequency or frequencies outside the frequency band . . ." is considered applicable to the determination of compliance with Section 12.113.

If operation near either edge of an amateur telephony band is contemplated, all amateurs are cautioned that radiation of energy outside the band to the degree indicated in Section 12.133 will be considered to be in violation of Section 12.113, whether double-sideband full-carrier or single-sideband suppressed-carrier is used.

Very truly yours,

MARY JANE MORRIS  
Secretary

# A Modern Medium-Power Transmitter

## The 4-65A in a Multiband VFO Rig

BY RICHARD A. EGBERT,\* W8ETU, EX-W2QMO

• Built with an eye primarily on contest competition, this neat piece of construction combines features that will appeal to all types of operators. Designed around the versatile 4-65A, it will operate efficiently at any plate voltage from 600 to 2000 or more, at inputs from 90 watts or less up to 300 watts. Features include remote-tuning VFO, bandpass-coupled multiplier stages, multiband driver tuning, pi-section output, and differential keying for clean break-in operation. Covers all bands from 80 through 10.

THE urge to rebuild and improve the station equipment periodically hits us all. In the author's case, this urge was brought about by the trend in the local amateur radio club, The Order of Boiled Owls, toward the more serious amateur activities, such as Sweepstakes, DX contests, and a generally competitive program. Since the main transmitter at W2QMO was a far cry from what is needed in the way of a transmitter for contests and the like, several requirements for what we thought would make a truly modern rig were written down. It was felt that the new rig should be capable of the following:

- 1) Respectable power output by today's standards.
- 2) Full break-in operation.
- 3) Excellent keying characteristics.
- 4) Absolute freedom from TVI.

\* % Bell Sound Systems, Columbus, Ohio.

<sup>1</sup> Long, "Cutting Down VFO Drift," *QST*, August, 1952.  
Mix, "Simple Remote Tuning for the VFO," *QST*, January 1953.

The 4-65A transmitter in a rack cabinet with remote VFO and control unit to the right. Along the bottom of the main panel are the band-switch, the grid meter and the excitation control. Above are the controls for the multiband tuner, the plate tank capacitor, the rotary inductor, and the output-capacitor switch. The plate milliammeter is at the top.

5) Safety from electrical shock in the course of normal operation.

6) Minimum fussing to get from one band to another.

7) Pleasing, commercial appearance.

The usual perusal through recent issues of *QST* and other magazines failed to turn up a design that quite fitted the above, but many good features were noted, some of which have been incorporated in the transmitter to be described. The rig shown in the accompanying photographs has been in constant operation for more than a year, with results that have more than justified the time and effort expended in building it.

### The Circuit

Fig. 1 shows the schematic circuit, beginning with the familiar Clapp oscillator. The oscillator tuned circuit, padders, and feed-back capacitors are mounted in a separate  $5 \times 6 \times 9$ -inch aluminum utility box, and connected to the main transmitter chassis by a six-foot length of RG-22/U cable. This arrangement, as introduced and discussed in previous issues of *QST*,<sup>1</sup> has proved to be a sure-fire method of building an oscillator that "sits still" almost from the moment it is turned on. There is nothing more disconcerting than working in a net, or sweating out DX, with a VFO that wanders for a number of hours before settling down. With the VFO tuned circuit apart from the main portion of the transmitter, and kept a reasonable distance from other sources of heat, the oscillator frequency becomes stable very soon after the rig is turned on. As with all oscillators, the quality of the components in the frequency-determining circuits should be the highest possible, and the construction rigid.





Fig. 1 — Circuit of the modern medium-power transmitter. All capacitances less than 0.001  $\mu$ f. are in  $\mu$ f. All 0.001- and 0.005- $\mu$ f. capacitors are disk ceramic.

M = Mica SM = Silver mica CER = Ceramic  
 C<sub>1</sub> — Midget variable.  
 C<sub>2</sub>, C<sub>3</sub>, C<sub>6</sub>, C<sub>7</sub>, C<sub>8</sub>, C<sub>9</sub>, C<sub>10</sub>, C<sub>11</sub>, C<sub>12</sub>, C<sub>13</sub> — Air trimmer.  
 C<sub>14</sub> — Midget dual variable.  
 C<sub>15</sub> — Voltage rating equal to plate voltage for c.w., twice plate voltage for plate modulations (see Footnote 6).  
 C<sub>16</sub> — 100- $\mu$ f. mica (CM-45).  
 L<sub>1</sub> — 50 turns No. 14, 2 inches diam., 5 inches long (B & W No. 3907-1 coil stock).  
 L<sub>2</sub> — 90 turns No. 30 enam., on  $\frac{1}{2}$ -inch iron-lug form.  
 L<sub>3</sub>–L<sub>10</sub> — See Table 1.  
 L<sub>11</sub> — 22 turns No. 18 enam., 1 inch diam., close-wound.  
 L<sub>12</sub> — 8 turns No. 18 enam., 1 inch diam., 1 inch long.  
 L<sub>13</sub> — 4 turns No. 14, 2 inches diam., 2  $\frac{1}{2}$  inches long.  
 L<sub>14</sub> — Rotary inductor — not less than 20  $\mu$ h. maximum.  
 L<sub>15</sub> — See text.  
 CR<sub>1</sub> — Selenium rectifier.  
 J<sub>1</sub>, J<sub>2</sub> — Amphenol 83-22R connector.  
 J<sub>3</sub> — Amphenol 83-1R coax connector.  
 MA<sub>1</sub> — 2-inch square meter.  
 MA<sub>2</sub> — 3-inch square meter.  
 RFC<sub>1</sub> — National R-175A.  
 RFC<sub>2</sub> — Ohmite Z-50.  
 S<sub>1</sub> — S.p.s.t. toggle.  
 S<sub>2</sub> — Ceramic rotary switch: 3 sections, 1 circuit per section, 4 positions. Centralab P-121 index, PIS wafer. (Centralab 2545)  
 T<sub>1</sub> — 6.3-volt 6-amp. filament transformer.  
 T<sub>2</sub> — 6.3-volt 1.2-amp. filament transformer.

The oscillator tube, a 6AH6, was chosen after a struggle with the types that are more usually used in this service. One of the requirements for the keying circuit employed is that the oscillator start with as little delay as possible after the key is closed. Since the feed-back to the oscillator is low, due to the high values of C<sub>4</sub> and C<sub>5</sub> and the L/C ratio used, plus the capacitance of the length of RG-22/U, a tube with a high value of transconductance must be used. In the so-called electron-coupled type of circuit, the screen grid is used as the principal anode, instead of the plate, and the transconductance we're talking about is the grid-to-screen transconductance. Although the 6AG7 is the most frequently used oscillator tube these days, it did not perform well in this circuit. The 5763 was also tried but, with either tube, the oscillator did not start quickly enough, and the output signal was chirpy. All other things being equal, the 6AH6 seems to be the best of the bunch for the job, and further work along these lines is contemplated.

The oscillator operates in the 80-meter band, and is switched to either of two ranges by S<sub>1</sub>. With S<sub>1</sub> closed, the oscillator tunes from 3.5 to 3.75 Mc. and when S<sub>1</sub> is open, the range is from about 3.75 to 4.0 Mc. This arrangement provides 180 degrees of bandspread on 80-meter c.w., nearly 135 degrees on 40 meters, 90 degrees on 20, and about 75 degrees on the 15-meter band. The 10-meter band is spread over most of the dial and, in the second-range position, the 75-meter 'phone band occupies almost all of the dial. With the 5-to-1 ratio of the National ACN dial, tuning is quite easy.

<sup>2</sup> Chambers, "A Two-Control VFO Rig with Bandpass Exciter," *QST*, August, September, 1950.

<sup>3</sup> Chambers, "Single-Ended Multiband Tuners," *QST*, July, 1954.

A 6C4 cathode follower isolates the oscillator from subsequent stages, and its output is more than adequate to drive the 6AK6 80-meter stage. L<sub>2</sub>, in the grid circuit of the 6AK6, is tuned to a frequency slightly higher than 4.0 Mc. This adjustment provides fairly constant drive to the 6AK6, since the output from the Clapp oscillator falls off very seriously as the circuit is tuned higher in frequency.

Quick and easy frequency changing in a transmitter dictates the use of fixed-tuned circuits wherever possible. Having to search through piles of charts for the proper multiplier-control settings, and adjusting numerous controls is hardly easy operation. Loaded, broadband inductors eliminate the need for tuning, but result in wide variations in output from the stages using them when the frequency is shifted appreciably. In addition, self-oscillation sometimes occurs in the multiplier stages at some frequency between the center frequencies of two of the coils.

Although not new by any means, the bandpass coupler has been sadly neglected by the amateur fraternity as a means of having one's cake and eating it, too.<sup>2</sup> The bandpass coupler, if properly used, can be made to provide uniform output over an entire amateur band. Because the coupling is inductive, rather than capacitive, and since there are two tuned circuits, rather than one, a measure of protection against transfer of unwanted harmonics is provided. The bandpass couplers are adjusted as described later, and then switched in and out of the circuit, as needed, without further adjustment. As it turns out, the switching scheme of this transmitter is quite a bit more simple than one would expect, since it is accomplished with a 3-pole, 4-position switch.

Except for the bandpass couplers, the multiplier stages are conventional, with cathode bias to limit the plate dissipation of the tubes not in use at any given time. One of the 6C4s is a tripler, to provide output on 15 meters. The other two are doublers.

For the purist, a small ceramic trimmer capacitor could be connected from grid to ground in each of the multiplier stages, since the input capacitance of the 6C4s is somewhat lower than that of the pentode driver, and some change in the coupler secondary tuning occurs when switching from a multiplier grid to the driver grid.

The driver, a 5763, is driven on 80 meters by the 6AK6, and on all other bands by one of the multipliers. The screen voltage to the 5763 is supplied from a potentiometer, R<sub>1</sub>, which controls the output of the driver stage, and consequently the drive to the final amplifier. The 5763 is shunt fed in its plate circuit, and its output is capacitively coupled to a multiband tuner<sup>3</sup> in the grid of the final amplifier.

The driver operates straight through on all bands except 10 meters. It is driven by the 20-meter multiplier, and doubles to 10 meters for output in the 10-meter band. Adequate output from the driver is available on all bands to drive the final amplifier to full output.

The pi-section tank circuit is a good choice in



any transmitter, but where the voltages are high enough to be extremely dangerous, it is literally a lifesaver. No need to put one's hands inside the transmitter during normal operation as with plug-in coils, and the additional harmonic attenuation and operating ease afforded by the pi network makes this type of final-amplifier tank circuit very desirable indeed.

The final amplifier shown in the schematic diagram and photographs is, with the exception of the tube type, almost an exact duplication of one described in an earlier issue of *QST*.<sup>4</sup> It was found unnecessary to neutralize the final in our particular layout, since the amplifier was stable on all bands. Although not shown in the schematic, a parasitic suppressor is used in the plate lead of the 4-65A, to rid the transmitter of the inevitable v.h.f. parasitic.

The final-amplifier tube, a 4-65A, was chosen because of its reputation for stability and ruggedness, and its ability to operate efficiently at plate voltages from 600 to 3000 volts. At a plate voltage of 2000 volts, it is possible to load the final to an input of 300 watts.

$L_{14}$  is a rotary inductor whose origin is unknown, but whose inductance turned out to be just what was needed. It is considerably larger, physically, than is necessary in a transmitter of this size, and one of the smaller commercial units could be used instead.  $L_{13}$ , an air-wound inductor, constitutes nearly all of the tank inductance when the transmitter operates on 10 meters, and its inclusion shifts the shunt capacitance of the rotary inductor to the output side of the pi network,

<sup>4</sup> Grammer, "Pi-Network Tank Circuits for High Power," *QST*, October, 1952.

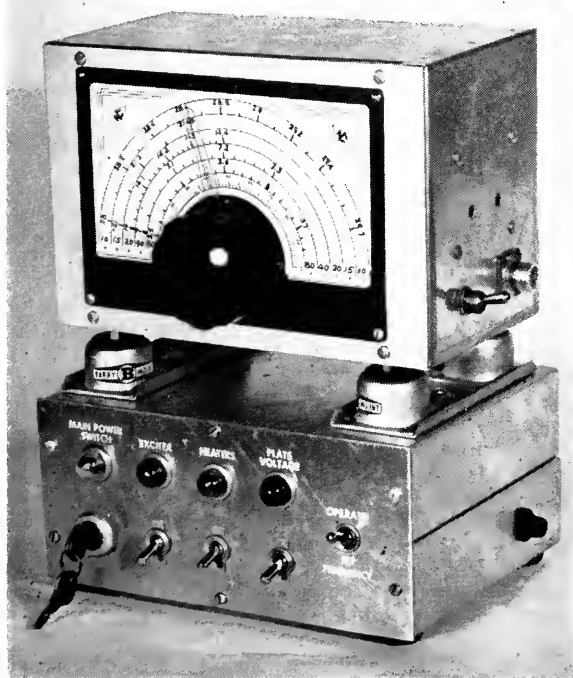
tending to keep the  $Q$  of the tank circuit down at 10 meters. This has been explained in *QST*.<sup>4</sup> The output capacitors are 100- $\mu$ mf. Type CM-45 mica units, switched in and out of the circuit by  $S_3$ , a progressively-shorting rotary switch.  $RFC_1$  is a National type R-175 choke which has been modified to be effective on all amateur bands from 3.5 to 30 Mc. Since this transmitter was built, the National Company has announced a new shunt-feed r.f. choke, the R-175A, that is free from "holes," and is usable in this type of rig without modification.

As one of the preventives against TVI, a series-resonant circuit, consisting of a 100- $\mu$ mf. mica capacitor,  $C_{16}$ , and a few turns of wire,  $L_{15}$ , is connected across the output of the transmitter, at the output connector. This series-tuned circuit is adjusted to resonate at the frequency of the television channel most likely to be interfered with in a given locality, and is effectively a short circuit across the transmitter output at this frequency. Thus, any harmonics generated within the transmitter at, for example, 56 Mc., are prevented from reaching the antenna.

Screen voltage to the final amplifier tube is supplied through a dropping resistor, and the tube is protected in the usual manner with a 6W6GT clamp tube. Two clamp tubes in parallel would afford better protection, in the event of failure of one of them. The 0B2 voltage-regulator tube is connected in series with the screen lead of the 4-65A to reduce the input to minimum under key-up conditions. The 0B2 can be seen mounted on a bracket under the chassis. (It was an afterthought.)

### Keying

As shown in the schematic, the transmitter is equipped with a built-in differential keyer. For those who are not familiar with differential keying, it may seem to be excess baggage. This is not at all the case. Much of the break-in operation on the air today is accomplished by keying the



The VFO remote tuning unit and control box. The tuning unit is enclosed in a 5 × 6 × 9-inch aluminum box mounted on shock absorbers. The control-unit enclosure is made up of two 7 × 9 × 2-inch aluminum chassis, bottom to bottom. The range-control switch and remote cable connector are mounted on one end of the tuning unit. A fuse holder projects from the end of the control unit.

oscillator. Fortunately, the Clapp oscillator, which is now almost universally in use, keys better than its forerunners, but there aren't many keyed oscillators that can be boasted about when compared to a keyed amplifier. For the ham who takes pride in his signal, oscillator keying of any kind is pretty much out of the question. Of course, break-in operation can be had by using a well-shielded oscillator, left running while keying a later stage, or by using some form of heterodyne exciter. These two schemes are certainly workable, but present problems that are not easily overcome by the average ham. Many of the differential keying arrangements require high-voltage bias supplies and high-priced relays. Some time ago, an article, in *QST*,<sup>5</sup> described a keyer circuit that needs only 75 volts of negative bias, and no relays. It is this keyer that is incorporated into the rig being described. The extra components involved are few and inexpensive, and good amplifier keying can be had, with all the conveniences of the keyed oscillator.

The keyer circuit consists of a twin-triode oscillator-switching tube, and another twin triode in a standard vacuum-tube keyer circuit. With the key up, the 6BL7GT is cut off, and the current through the right-hand section of the 12AU7 is limited to a low value by the cathode resistor.  $R_2$  is adjusted to provide a sufficiently negative potential at the plate of the left half of the 12AU7 to cut the oscillator off. When the key is closed, the grid of the right half of the 12AU7 is grounded immediately, the cathodes assume a low positive voltage, the grid of the left triode becomes negative, and the plate of the left half assumes ground potential. Thus, in a very short period of time, the oscillator is turned on. The resultant click generated by the oscillator coming on quickly is not heard in the output because the charge accumulated in  $C_{17}$  must leak off to ground through  $R_3$  before the 6BL7GT

conducts. By the time the 6BL7GT is conducting, and the signal is on the air, the click generated by the oscillator is over with.

When the key is released, the grids of the 6BL7GT and the right half of the 12AU7 will start falling to the bias-supply voltage. The 6BL7GT will cut off first, and some time later the voltage across the key will get to a sufficiently negative value for the left half of the 12AU7 to conduct, cutting the oscillator off. The oscillator, therefore, has been turned on before the amplifier (in this case, the driver) is keyed, and is turned off after the amplifier has stopped delivering power.

The keyer bias-supply transformer,  $T_2$ , is simply a low-current filament transformer, connected backwards, with its 6.3-volt winding excited from  $T_1$ , and its primary delivering 115 volts to a selenium rectifier,  $CR_1$ , and a conventional resistance-capacitance filter.

Metering is necessary only in the final-amplifier grid and plate circuits, since all other stages are fixed tuned. Two meters are employed — a 2-inch unit,  $MA_1$ , mounted under the chassis to measure grid current, and a 3-inch meter,  $MA_2$ , on the panel, reading plate current.

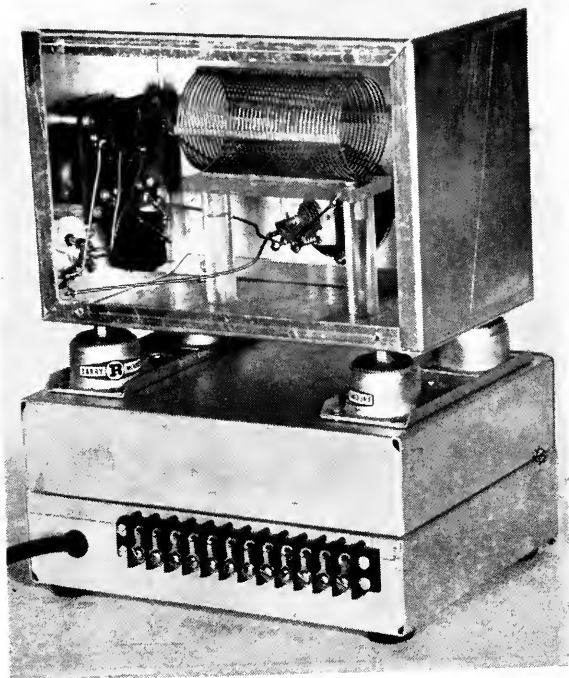
Connections to the transmitter are made via a barrier strip mounted on the rear skirt of the chassis, and a Millen safety terminal for the high voltage.

### Construction

The r.f. section of the transmitter, with the exception of the oscillator tuned circuit, is built on a standard  $13 \times 17 \times 3$ -inch aluminum chassis, with a  $10\frac{1}{2} \times 19$ -inch rack panel. All

<sup>5</sup> Puckett, "De Luxe Keying without Relays," *QST*, September, 1953.

Rear view of the tuning unit showing the mounting of the inductor on polystyrene sheet and rods and the arrangement of other components. Ceramic trimmers, mounted on the insulating panel at the left, were later replaced with air trimmers ( $C_2$  and  $C_3$ ).



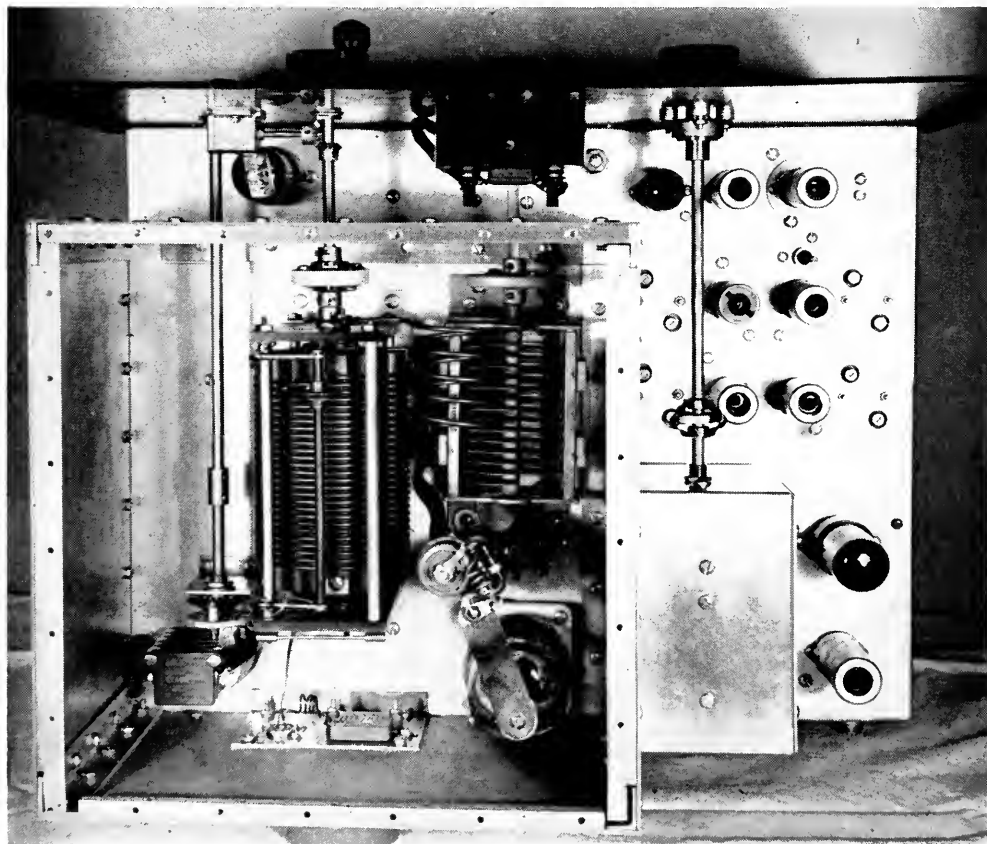
of the mechanical work was done at home, in the shack, using the common hand tools that most hams possess, and a couple of chassis punches. Most of the details are readily apparent from the photographs, and the layout is quite straightforward and conventional. About one-third of the main chassis is taken up by the exciter chassis. The remainder is enclosed in a "doghouse" constructed of aluminum sheet and angle, and fastened together with machine screws. The enclosure is approximately 10 by 10 by 7 inches.

The top-view photograph shows most of the chassis layout, with the 6AH6 oscillator tube located in the top right-hand corner and the cathode follower next to it at the left. Immediately to the left of the cathode follower is the 12AU7 keyer tube. Directly below the 6AH6 is the 6AK6 80-meter stage and, to its left, the 40-meter doubler. The 15-meter tripler is located behind the 40-meter stage, and the 20-meter doubler to its right. Arranged to the right and left of the associated tubes, the adjusting screws for the bandpass couplers can be seen.

Top view of W2QMO's transmitter. At the right, from left to right, progressing toward the bottom are the 12AU7, the 6C4 cathode follower and the 6AH6, the 40-meter 6C4 and the 80-meter 6AK6, the 15- and 20/10-meter 6C4s, the 6BL7GT, and the 5763. The 6W6GT clamper tube is at the upper left. The multiband tuner for the 5763 is enclosed in the box fastened against the final-amplifier enclosure. The tank capacitor is placed so that its shaft is central on the panel, and the rotary inductor is located so that its control and the control for the multiband tuner are symmetrical in respect to the tank-capacitor control. The turns counter for the rotary inductor is geared to the coil drive shaft.  $S_3$  and the mica output capacitors are off the left rear corner of the inductor. The v.h.f. series-resonated circuit is mounted against the rear wall, adjacent to the output connect. A copper strap connects the top of RFC<sub>1</sub> to the plate cap of the tube.

The multiband tuner used in the grid circuit of the final amplifier is housed in a 3 × 4 × 5-inch aluminum utility box, bolted to the side of the final-amplifier enclosure. The dial drive to this unit is equipped with a 5-to-1 reduction mechanism for easier tuning. (A National AN or AVD driver may be used here.) To the right of the multiband-tuner box, the 5763 driver tube is mounted, with the 6BL7GT keyer tube directly above it.

The final-amplifier components are mounted inside the enclosure, and arranged for short leads and panel symmetry. The socket for the 4-65A is mounted above the chassis on short spacers, with holes for air circulation below it. By-pass capacitors for the screen and heater of the final tube are grounded directly below the respective socket terminals, with suitable ground lugs fastened to the chassis. A shielded lead from the multiband tuner to the grid terminal of the 4-65A socket is run through the bottom of the utility box and the chassis and up through a hole in the chassis directly below the tube socket.

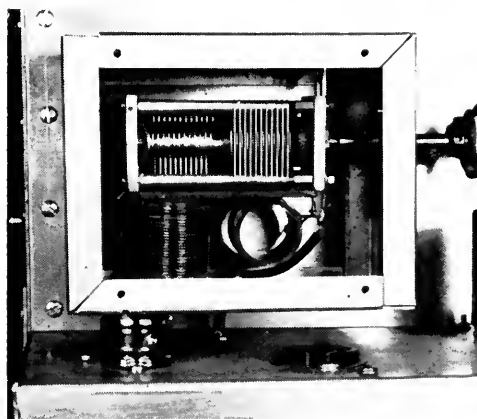


The 6W6GT clamp tube is mounted in front of the final-amplifier enclosure toward the right side of the chassis. Above the clamp tube, the Veeder Root counter can be seen. This was included to provide accurate resetting of the variable inductor. The counter is gear-driven from the rotary-induction shaft.

The bottom-view photograph shows the component layout, terminal strip and connectors. Since the photographs were made, a fan has been mounted below the final-amplifier tube socket, to aid in cooling.

### Building the Bandpass Couplers

The bandpass couplers started life as i.f. transformers. The original windings, forms, and cans were removed and discarded, and polystyrene coil forms, 1 inch in diameter and  $1\frac{1}{2}$  inches long, were drilled through their bottoms to be mounted on the studs that project from between the air-padding capacitors. The primary windings of the 80- and 40-meter coils are wound at the bottom ends of the forms and cemented in place with coil



The multiband tuner used between the driver and final amplifier is housed in a  $3 \times 4 \times 5$ -inch box fastened to the side wall of the amplifier enclosure. The 5763 and 6BL7 have been removed in this view.

dope. After the dope has dried, the rest of the coil form is sprinkled with talcum powder, and a layer of cellophane tape is wound around it, with the adhesive side out. On the sticky side, the secondary turns are wound firmly, but not so tightly that the winding can not be slid along the form for adjustment. The ends of the secondary windings are held in place with coil dope, applied carefully so that the whole thing doesn't become cemented to the form so that the secondary cannot be moved. The ends of the windings are now soldered to the capacitors, and the 80- and 40-meter couplers are complete.

The 20- and 15-meter couplers are made from Barker & Williamson Miniductors, lengths of which are slid inside the polystyrene coil forms. The forms are first slit with a fine saw to permit the ends of the windings to come out radially. The primary windings are inserted in the poly forms first, and the secondaries are slid in and out as needed for adjustment.



This photograph shows the method of assembling the bandpass couplers as described in the text.

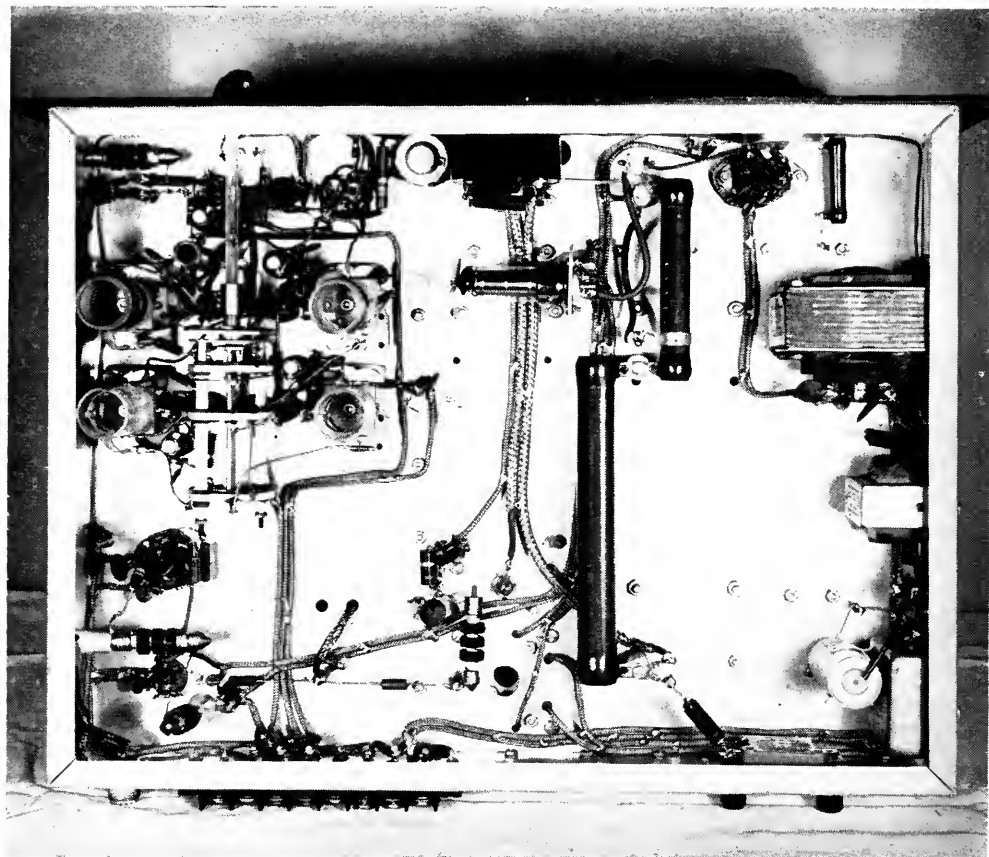
### Power Requirements

Power supplies for the author's transmitter were built on a single  $13 \times 17 \times 3$ -inch steel chassis. Although the 4-65A will operate satisfactorily at plate potentials from 600 to 3000 volts, at least 2000 volts is necessary for an input of 300 watts.  $T_1$  supplies the final-amplifier, clamp-tube, the 6BL7 keyer-tube heaters, and  $T_2$ , the keyer bias transformer. The balance of the heaters are supplied from a replacement-type power transformer, rated at 750 volts, center-tapped, and 6.3 volts at 3.5 amperes.

It will be noticed that no power switches appear on the transmitter proper. All switching is done at a central control panel, located beneath the VFO tuning unit. As the schematic of Fig. 2 shows, 115 volts a.c. is brought into an automobile ignition switch,  $S_1$ , which allows the entire station to be shut off with a key. Since the key is carried in the author's pocket, there is little likelihood that the junior ops will get their little fingers across the high voltage. The switching is arranged so that it is necessary for the exciter, final heaters and high-

TABLE I  
Bandpass Coupler Data

Coil	Band	Turns	Wire	Spacing	B & W No.
L <sup>3</sup>	80	44	30 enam.	$\frac{1}{4}$ "	
L <sup>4</sup>	80	37	30 enam.		
L <sup>5</sup>	40	21	30 enam.	$\frac{7}{16}$ "	
L <sup>6</sup>	40	16	26 enam.		
L <sup>7</sup>	20	15	24 tinned	$\frac{9}{16}$ "	3012
L <sup>8</sup>	20	10	24 tinned		3012
L <sup>14</sup>	15	9	24 tinned	$\frac{1}{2}$ "	3012
L <sup>15</sup>	15	6	24 tinned		3012



Bottom view of the main chassis showing the grouping of the bandpass couplers around the bandswitch in the upper left-hand corner.  $R_2$ , the bias-adjusting potentiometer for the v.t. switch circuit, is to the left of the grid-current milliammeter, top center. The 0B2 in the 4-65A screen circuit is mounted on a bracket below the meter. Filament and bias transformers are to the right. All power wiring is done with shielded wire.

voltage-rectifier heaters to be turned on before the power can be applied to the plate transformer.

The switch,  $S_5$ , a d.p.d.t. toggle, is the usual spotting switch, which grounds the key lead and opens the primary circuit of the plate transformer.

The power-control panel is made from two  $7 \times 9 \times 2$ -inch aluminum chassis, bolted together with their bottoms facing, with most of the front skirts cut away to receive an aluminum panel. The VFO tuned-circuit box is mounted on this with shock mounts.

### *Tuning Up*

After all wiring is checked, the oscillator tube and cathode follower are plugged into their sockets, and the exciter power turned on. If all is well, the signal will be heard in a receiver, in the vicinity of the 80-meter band. Next,  $S_1$  is opened,  $C_1$  set at minimum capacitance, and  $C_2$  adjusted until the signal is heard slightly above 4 Mc. When  $C_1$  is set at maximum capacitance, the signal should be found in the vicinity of 3.75 Mc.  $S_1$  should now be closed, and  $C_3$  adjusted until the signal is heard at slightly below 3.5 Mc. Some slight pruning of the tuned circuits may be

necessary, but it should be possible to get the oscillator to operate from below 3.5 Mc. to over 4.0 Mc., with a slight overlap around 3.75 Mc.

Now the bandpass couplers can be tuned, and this takes a lot more time to tell about than it does to accomplish. Set the bandswitch in the 80-meter position, the excitation control at zero, and plug in the rest of the tubes in the exciter section. Temporarily ground the cathode of the 5763, and connect a high-resistance voltmeter across the 5763 grid-leak resistor. All bandpass-coupler secondary windings should be pulled as far away from the primaries as possible. The VFO is now set at 3.75 Mc., and  $C_6$  and  $C_7$  tuned for maximum indication on the voltmeter. The secondary winding,  $L_4$ , should now be moved toward  $L_3$ , until the spacing is that given in the coil table. This spacing should be set very carefully in all cases, since a small deviation will result in a change in the bandpass characteristic. It is also to be noted that the coupler tuning capacitors are to be adjusted only when the windings are at the maximum spacing.

Next, move the high-resistance voltmeter to read the drop across the 6AK6 grid-leak resistor and set the VFO frequency at 4 Mc. Now adjust

$L_2$  for maximum grid voltage, and swing the VFO through its entire range. If the grid voltage increases when the frequency is lowered, decrease the inductance of  $L_2$ . Correct adjustment of  $L_2$  will result in nearly constant drive to the 6AK6 throughout the entire VFO range.

The rest of the bandpass couplers can now be adjusted, following the procedure described above for the 3.5-Mc. coupler, and with the voltmeter once again reading driver grid voltage. The 40-meter coupler should be adjusted with the VFO set at 3.6 Mc., the 20-meter coupler should be adjusted at 3.6 Mc., and the 15-meter coupler at 3.55 Mc. It should now be possible to tune through any of the bands with less than ten per cent variation in drive to the 5763.

The multiband tuner can now be checked, with the 4-65A in its socket, and heater voltage applied. It is suggested that a grid-dipper be used to ascertain that the grid circuit is tuning to the proper frequency and not to a harmonic. Grid tuning-dial settings should be logged for future reference, and note taken if two bands resonate at the same dial setting. If, for example, the 80- and 20-meter resonance points occur at or near the same dial setting, pruning of one of the coils will be necessary.

Adjustment of the keyer can now be made after removing the ground from the 5763 cathode.  $R_2$  is advanced toward its positive end (ground) until the voltage at Pin 1 of the 12AU7 is  $-15$  volts. The keying characteristic can be adjusted to individual taste later by adjusting the value of  $C_{17}$ .

### Pi-Tank Adjustment

The final amplifier is best tested at reduced plate voltage. Either a 50-ohm dummy load or an antenna known to present a resistive load of 50 ohms should be used for initial tune-up. Adjustment of the excitation control,  $R_1$ , will provide the correct grid current of 15 ma. to the final. With the bandswitch set in its 80-meter position, and the grid tank resonated, the plate tank capacitor,  $C_{15}$ , should be set at about 90 per cent of its maximum value, and the rotary inductor set at near-maximum inductance. A grid-dipper could be used here to establish a near-resonance point. The plate voltage should be applied, and  $C_{15}$  quickly tuned for a plate-current dip. If an appreciable change in capacitance is necessary to establish resonance, a new setting of the variable inductor should be tried, until the plate circuit resonates at 3.5 Mc. with almost all of the capacitance of  $C_{15}$  in the circuit. Full plate voltage can now be applied, and loading adjusted for a plate current of 150 ma. Now is a good time to check the 4-65A screen voltage, which should be 250 volts.

Adjusting the final amplifier on the other bands is carried on in much the same manner, setting the final tank capacitor to approximately the correct value (see Table II), adjusting the rotary inductor for resonance with a grid dipper, and finally resonating the circuit with power on. All settings should be logged for future reference.

It must be borne in mind that the values of inductance and capacitance given in the tune-up

(Continued on page 120)

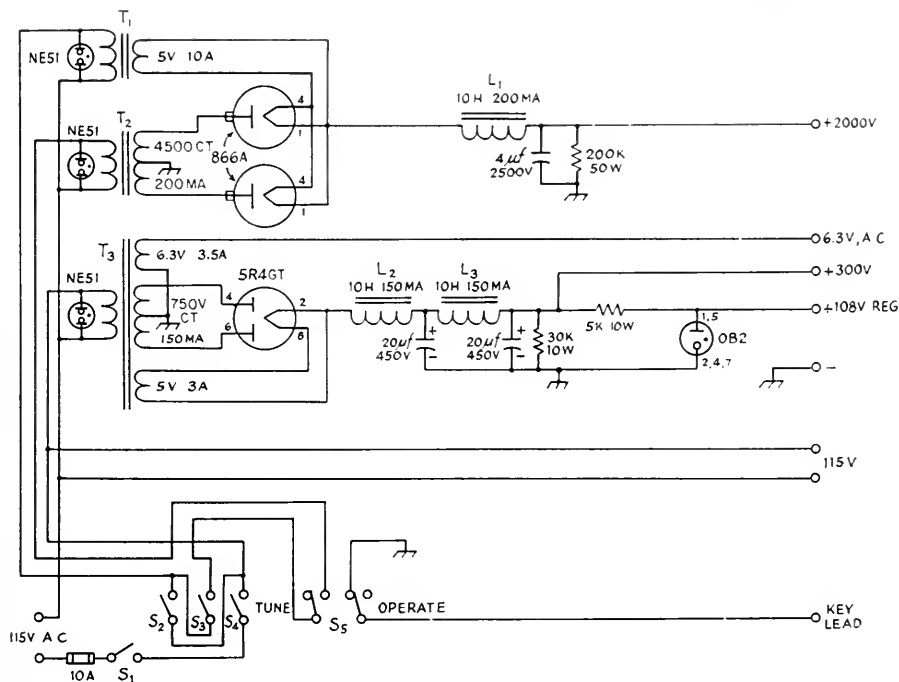


Fig. 2 — Power-supply circuit for the 4-65A transmitter. S<sub>1</sub> is an automobile ignition switch, controlling all primary power. S<sub>1</sub> turns on line voltage to the transmitter filament transformers and also turns on the low-voltage supply. S<sub>2</sub> turns on the 866 rectifier filaments, and S<sub>3</sub> controls the high-voltage transformer.

# The "Extended Lazy H" Antenna

BY WALTER E. SALMON,\* VK2SA

ROTARY BEAMS were unknown in the early days of amateur radio, and most hams contented themselves with horizontal or vertical wires from which, after much patient work, they obtained varying degrees of effectiveness. With the development of the Yagi antenna the 2-, 3- and 4-element rotary beam became commonplace, and it would appear that the trend in this direction is increasing, particularly with amateurs residing in thickly-populated areas where land space is limited. No comment will be included about V beams and rhombics, since this article is written for the amateur who, although he is interested in operating on several bands, is not prepared to erect a costly mast structure to support several beams and also does not have the relatively-unlimited space necessary for the usual "dream" antenna farm.

The antenna to be described is completely original and to the writer's knowledge has not been described in any local or overseas journal. We have "ZL Specials" and "G8PO antennas" and, for want of a name, this antenna might be called the "extended lazy H." Several years ago a conventional lazy H antenna was cut for 14 Mc. and installed at VK2SA. This aerial consisted of two horizontal collinear elements stacked and separated a half wavelength. The top of the array was supported by two 41-foot masts, thus leaving the bottom section only 9 feet above the ground. The effective height of this type of antenna is measured from the halfway point between top and bottom elements and thus, in this case, the effective height was about 25 feet. The observed effectiveness was only about equal to a full-wave Zepp 41 feet high.

Attention was then directed to the possibilities of the "extended double Zepp" described in *QST* for June, 1938. The height of one mast was increased to 45 feet, to compensate for ground slope, and the antenna was cut for 14 Mc. and erected for NE-SW directivity. Improved effectiveness by comparison with the full-wave antenna was apparent on 14-Mc. W contacts. In addition, some excellent 'phone contacts were made on 7 Mc. with W stations. Results on 21 Mc. indicated a number of major lobes that gave good DX contacts. From the results it would appear that this type of antenna possesses the desirable feature of good effectiveness on several amateur bands. The gain of the extended double Zepp is given in most textbooks as 3 db.

The theoretical gain of the conventional lazy

H antenna is given as close to 6 db., but it was considered attainable only if it could be supported about 70 feet in the air, so that the bottom elements were at least a half wavelength above ground. This was impossible with the existing masts. Consideration was then given to the possibility of adding two additional extended half-wave lower elements to the extended double Zepp. The additional elements were connected

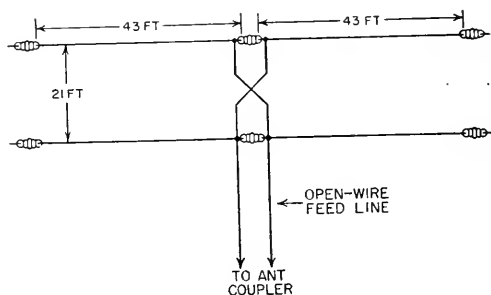


Fig. 1—Dimensions of the "VK Special" 7-, 14- and 21-Mc. beam antenna of VK2SA. Whether the antenna coupler will be series- or parallel-tuned will depend upon the length of the feed line and the band in use. At VK2SA the upper wire is 40 feet above the ground.

21 feet down on the feed line,<sup>1</sup> as shown in Fig. 1, and the feed line was transposed to give the proper phasing.

Results with the modified antenna were very gratifying, as was the ability to operate readily on three bands with the one antenna system. Although the directional characteristics on 21 Mc. are not yet known completely, the signal reports indicate the presence of major lobes giving good general coverage. On 7, 14 and 21 Mc. an antenna tuner is used, and an open-wire line with 4-inch spacing is used between tuner and antenna.

On 14 Mc. the antenna has outperformed all previous wire antennas tried out for W contacts on both long and short paths. The lower two elements were added to the extended double Zepp on December 19, 1954, and numerous W 'phone contacts have been made since that date. The majority of the signal reports are S8 and S9, and nothing below S6 from East Africa. The power input to the transmitter is 75 watts.

An analysis of all signal reports indicates equal if not better performance compared with rotary beams, and it would appear that the gain exceeds 6 db. Comparison reports have also been made by the simple expedient of removing the two lower elements—the antenna then becomes an extended double Zepp—and the signal was reported to drop 2 and sometimes 3 S points.

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<sup>1</sup> The point 21 feet down the feed line is a voltage loop, and one would normally connect half-wavelength elements at this point for in-phase drive of all elements. The modification by VK2SA is not the simplest array to analyze, but in view of his excellent results it is thought to be of considerable interest.—Ed.



# The Simplest Converter

*A One-Tube Design for Reception on 15, 10, 6, 2 or 1 1/4 Meters*

BY MASON P. SOUTHWORTH, W1VLH

• A common request showing up in mail for the ARRL Technical Information Service in recent years has been, "Where can I find information on a simple converter for 21, 28, 50 or 144 Mc., not crystal-controlled?" Seems that there are plenty of beginners, and not a few old-timers too, who want to receive on one or more of these bands without going to something complicated or tough to build. Here's the answer, and then some — a one-tuber that provides usable reception on 21, 28, 50, 144 or 220 Mc. You can cover 15, 11 and 10 meters without changing coils.

To a fellow getting started in ham radio, or even some new phase of the game, life can seem pretty complicated at times. A lot of the gear described in the magazines looks very nice and undoubtedly works well, but is just too complicated or takes too many hard-earned parts for beginners to think about building it. Here's a converter that was designed with these fellows in mind. It uses as few parts as is practical and construction is simple and straightforward. It also covers a lot of territory. You can build it for 21, 28, 50, 144 or 220 Mc. You can use it to listen in on any v.h.f. band, or to improve your reception on 15 or 10 meters, where many of the lower-priced commercial receivers fall short. The output frequency can be anywhere in the 40-meter region, and almost any receiver that tunes this range will do for the i.f. system.

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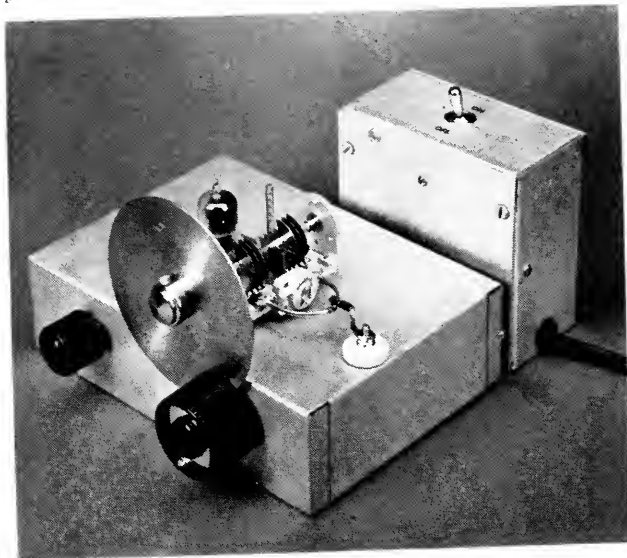
The "simplest converter" with its power supply attached. Latter may be eliminated if power is taken from the receiver with which the converter is to be used.

◆

You may have noticed that we haven't referred to this design as a multiband converter. You just can't have all those bands at once and simplicity too. Wide frequency coverage by means of switching or plug-in coils nearly always involves performance compromises, even at 50 Mc., and it is practically out of the question for 144 or 220 Mc. Bandchanging in this case is accomplished by removing two coils and soldering in a new pair. This approach doesn't lend itself to hopping around the spectrum, but it's hard to beat for simplicity and performance on any one band. Four coil sets are shown. One pair covers 15, 11 and 10 meters while the other three sets are for 6, 2 and 1 1/4. If the thought of soldering and unsoldering worries you, the converter is so simple that you can always build another for a second favorite band.

Perhaps the best way to describe a piece of gear like this is to state what it will do and what it won't. It will give usable reception on all the above bands. The noise figure does not represent the ultimate by any means, but you will hear all but the weaker ones on 144 and 220 Mc., and sensitivity on the lower bands will equal that of all but the best communications receivers. Stability is satisfactory after a warm-up period; good enough for c.w. reception, even on 144 Mc. Image rejection is low on 144 and 220 Mc., of course, but this is not often troublesome in actual operation. If this sounds like something you could use, let's see how little it takes to do the job.

A glance at the circuit diagram, Fig. 1, shows that only one tube is used, a 6J6 dual triode. One



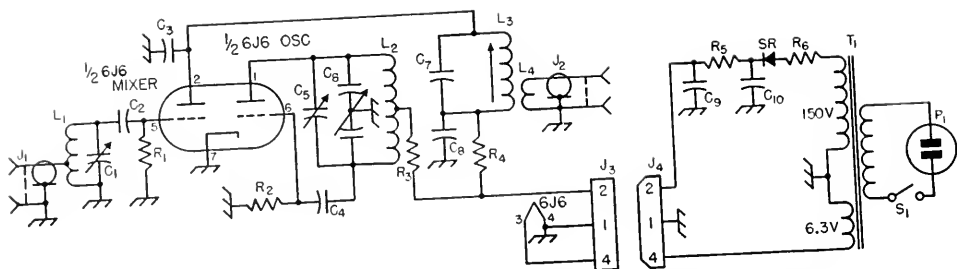


Fig. 1 — Schematic diagram and parts information for the simple converter.

- C<sub>1</sub> — 15- $\mu$ f. variable (Hammarlund HF-15).  
 C<sub>2</sub>, C<sub>7</sub> — 100- $\mu$ f. ceramic.  
 C<sub>3</sub> — 10- $\mu$ f. ceramic (connect close to plate pin).  
 C<sub>4</sub> — 47- $\mu$ f. ceramic.  
 C<sub>5</sub>, C<sub>7</sub> — 45- $\mu$ f. ceramic trimmer (Mallory ST-557-N; one for each band required).  
 C<sub>6</sub> — Split-stator variable, about 12- $\mu$ f. per section (Hammarlund HF-15X with 2 rotor plates and 1 stator plate removed from each section).  
 C<sub>8</sub> — 0.001- $\mu$ f. ceramic.  
 C<sub>9</sub>, C<sub>10</sub> — 16- $\mu$ f. 250-v. electrolytic.  
 R<sub>1</sub> — 1 megohm  $\frac{1}{2}$  watt.  
 R<sub>2</sub> — 10,000 ohms,  $\frac{1}{2}$  watt.  
 R<sub>3</sub> — 1000 ohms,  $\frac{1}{2}$  watt.  
 R<sub>4</sub> — 33,000 ohms,  $\frac{1}{2}$  watt.  
 R<sub>5</sub> — 3300 ohms,  $\frac{1}{2}$  watt.  
 R<sub>6</sub> — 22 ohms,  $\frac{1}{2}$  watt.  
 L<sub>1</sub> — 21, 28 Mc. — 16 turns B & W 3011, tapped 4 turns from ground end.  
 50 Mc. — 7 turns B & W 3007, tapped 2 turns from ground end.  
 144 Mc. — 2 turns  $\frac{1}{2}$ -inch diam. No. 12 tinned wire, spaced  $\frac{1}{4}$  inch, tapped  $\frac{3}{4}$  turn from ground end.  
 220 Mc. — 1 turn  $\frac{1}{4}$ -inch diam. No. 12 tinned wire, tapped near center.

- L<sub>2</sub> — 21, 28 Mc. — 15 turns B & W 3011 c.t. Add C<sub>5</sub> as in photo.  
 50 Mc. — 7 turns B & W 3007 c.t. Add C<sub>5</sub> as in photo.  
 144 Mc. — Hairpin loop of No. 12 tinned wire 1 inch long, 1 inch wide, c.t. Connect C<sub>5</sub> to C<sub>6</sub> terminals.  
 220 Mc. — Hairpin loop of No. 12 tinned wire,  $\frac{3}{4}$  inch long,  $\frac{3}{8}$  inch wide with  $\frac{3}{8}$ -inch leads, c.t. Connect C<sub>5</sub>  $\frac{5}{8}$  inch from capacitor terminals; see photo.  
 L<sub>3</sub> — 24 turns No. 24 enamel on  $\frac{3}{8}$ -inch iron-slug form (National XR-91).  
 L<sub>4</sub> — 4 turns No. 24 d.c.c. or enamel at cold end of L<sub>3</sub>.  
 J<sub>1</sub>, J<sub>2</sub> — Phono jacks (Cinch 81B or two Cinch 81A single jacks).  
 J<sub>3</sub> — 4-contact male chassis fitting (Amphenol 86RCP4).  
 J<sub>4</sub> — 4-contact female chassis fitting (Amphenol 78RS4).  
 P<sub>1</sub> — 115-volt line plug.  
 S<sub>1</sub> — S.p.s.t. toggle switch.  
 SR — 20-ma. selenium rectifier (Federal 1159).  
 T<sub>1</sub> — Power transformer, 150 volts at 25 ma.; 6.3 volts at 0.5 amp. (Merit P-3046).

half is the mixer, with its grid circuit, L<sub>1</sub>C<sub>1</sub>, tuned to the signal frequency. This circuit requires repeaking only with relatively wide shifts in frequency, once adjusted for the band in question. The mixer plate circuit L<sub>3</sub>C<sub>7</sub> is tuned to the intermediate frequency, about 7 Mc., and once adjusted is left alone. The second half of the 6J6 is a tunable oscillator. Energy from it beats with the signal in the mixer to produce the intermediate frequency. Its frequency is determined by the C<sub>5</sub>C<sub>6</sub>L<sub>2</sub> combination. The split-stator capacitor C<sub>6</sub> is used for actual tuning; the trimmer C<sub>5</sub> is for band-setting and to increase the bandspeed. That's all there is to it.

How much? The whole works will set you back less than \$15.00 even if you buy all the components new. Power can be taken from the communications receiver in most cases or, for about \$6.50 more, you can add a small selenium rectifier supply which could come in mighty handy around the shack to run various other small pieces of gear. This is shown at the right side of Fig. 1.

### How To Build It

Construction of the converter is simplicity itself. Everything is mounted on a standard 5  $\times$  7  $\times$  2-inch aluminum chassis (Premier ACH-426) and there are no special brackets to bend or buy. Fig. 2 is a layout of the chassis showing the location and size of every hole. The front

view photograph shows the tuning capacitor, C<sub>6</sub>, on top of the chassis with the trimmer (C<sub>5</sub>) and 144-Mc. coil soldered in place. The feed-through bushing near the edge of the chassis serves as a tie point for R<sub>3</sub> and holds the coil rigidly in position. Immediately behind C<sub>6</sub> the 6J6 and the tuning adjustment for L<sub>3</sub> are visible. The dial is a National type K. Note that a large knob (National type HRT-M) has been substituted for the one that comes with the dial to smooth out the tuning. The dial index has been mounted below on the front wall of the chassis instead of above, for obvious reasons, though you may prefer to add a panel in the usual manner. The 0 to 100 scale may be used for logging if you don't mind reading it upside down, or a calibration may be drawn on stiff white paper and cemented to the dial surface. The small knob to the left is the mixer grid circuit trimmer, C<sub>1</sub>.

A power supply is shown plugged into the back of the converter. If the power plugs are positioned so that this is possible, it will save making up a connecting cable. This supply, built entirely within a 4  $\times$  2  $\times$  2-inch utility cabinet, was described in more detail in *QST* for June, 1955.<sup>1</sup> The layout is not important, and it can be built in some other form if desired. If your receiver has an accessory socket there is no reason to use a separate power supply, as the

<sup>1</sup> Tilton, "Six Meters for the Beginner, Part II," *QST*, June, 1955.

drain of the converter is very low. Check your receiver instruction book for the required plug connections.

The various components visible in the bottom view have been labeled for ease in identification. Most of the small parts are grouped around the tube socket near the center of the chassis. There is very little wiring to be done other than soldering in these resistors and capacitors by their leads. Below the tube socket are the slug-tuned  $L_3$  and a two-terminal tie point supporting  $R_4$ .  $L_3$  is held in place by passing its leads through holes in the plastic rings supplied with the XR-91 coil form.  $L_4$  is wound around the by-passed end of  $L_3$  and is cemented or doped in place. Its leads are then twisted and run over to the output connector on the back of the chassis. If the dual connector shown is not available, two standard phono jacks can, of course, be substituted.

The mixer grid circuit is visible above and to the left of the tube socket.  $C_1$  is mounted on the front wall of the chassis and  $L_1$  is soldered across its terminals. A short piece of coax (RG-58, U or RG-59/U) is run from the input connector to the grid circuit. Here the braid is grounded to the rotor of  $C_1$  and the inner conductor is tapped onto  $L_1$  in the proper place. Note the two  $\frac{3}{8}$ -inch holes drilled between the tube socket and the tuning capacitor. These are for the leads from  $C_4$  and Pin 1 of the 6J6. These should pass through the chassis near the centers of the holes. The tube socket should be mounted as shown with Pin 1 adjacent to the large hole near the middle of the chassis.

The third photograph shows the coils for 15, 10, 6 and  $1\frac{1}{4}$  meters, the 2-meter coils being on the converter when the pictures were made. The oscillator coils with their trimmers ( $C_5$ ) and decoupling resistors ( $R_3$ ) are in the back row, and the mixer grid coils are in the front row. It is not necessary to use separate trimmers for each oscillator coil, of course, but doing this eliminates the need for readjustment when changing coils. The use of separate decoupling resistors does away with repeated soldering to the coil center

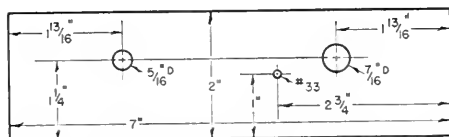
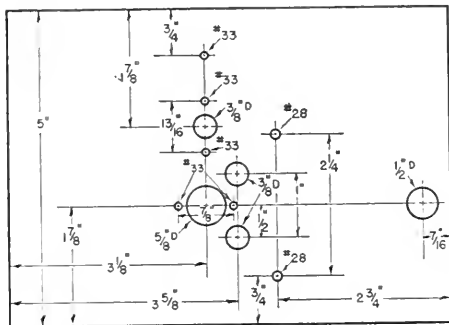
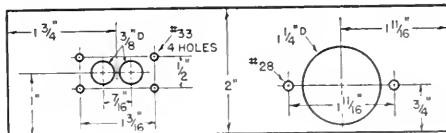
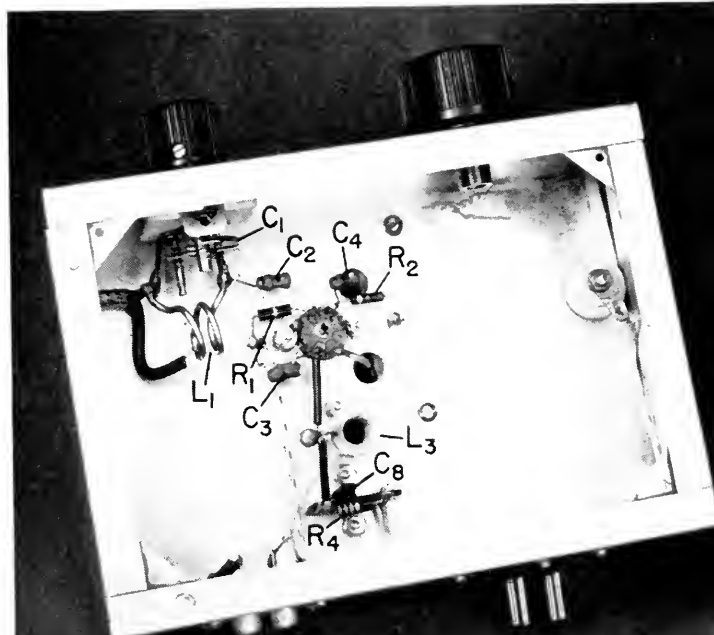


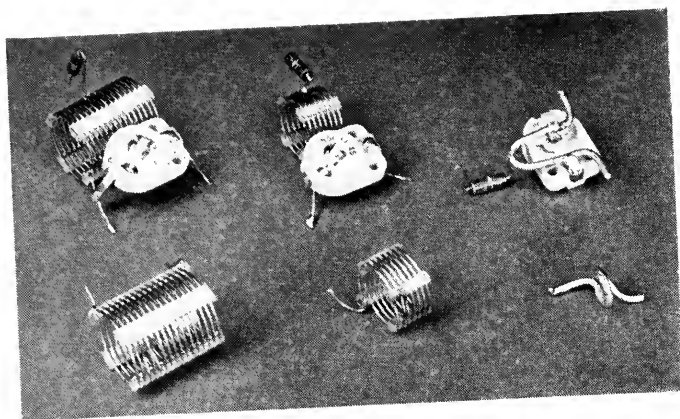
Fig. 2 — Layout drawing of the converter chassis, showing size and location of all holes.

tap. The coils for 50 Mc. and below are made of sections of B & W Miniductor. It will be easier to solder to these if the turns each side of the desired one are bent toward the center of the coil. The higher frequency coils are made from No. 14 wire as described in the parts list.

The oscillator capacitor,  $C_6$ , was modified slightly to secure more bandspread on the higher ranges. The end stator plate and the last two rotor plates of each section should be removed by twisting carefully with long-nosed pliers. This leaves four stator and three rotor plates in each section. If the converter is to be used on 144

Bottom view of the converter, showing the principal parts numbered as they appear on the schematic diagram.





Coils for the one-tube converter. Top row are the oscillator coils, with trimmers ( $C_5$ ) attached. Corresponding mixer coils below. Left to right, sets for 21 to 28 Mc., 50 Mc. and 220 Mc. The 144-Mc. coils appear in the converter photographs.

or 220 Mc. only, the bandspread may be increased by removing more plates, but it is advisable to leave them on until the proper frequencies are found.

### Making It Work

The first step in getting the converter going is to obtain suitable power for it. The requirements are 6.3 volts at 0.45 amp. and 75 to 100 volts at about 12 ma. These voltages should be borrowed from the receiver, if possible. Simply bring out leads from the filament circuit, some high voltage point, preferably regulated, and, of course, a connection to the chassis. This is easy if your receiver has an accessory socket. If you don't want to dig into the receiver, and no other suitable supply is available, the simple selenium rectifier unit described above will do the job. The output of this supply is about 125 volts.

The mixer was found to have the best noise figure with a plate voltage of about 75, so  $R_4$  was made a suitable value to provide this drop. If a different supply voltage is used it may be necessary to change the value of  $R_4$  to reduce the mixer voltage to about 75. This is not critical, though, and anything 20 volts or so either side is perfectly satisfactory. Even a 90-volt "B" battery will do the trick.

After settling the power supply question, apply filament voltage and see that the 6J6 heater lights up. Now apply plate voltage. The first check should be to see that the oscillator is working. If a milliammeter is available (10 to 100 ma. full scale will do) connect it in series with  $R_3$  to measure oscillator plate current. This should be somewhere in the neighborhood of 6 ma. and should rise when the oscillator coil,  $L_2$ , is touched with a pencil lead. If it is much higher, and does not change, the tube is not oscillating. Recheck the oscillator wiring for a mistake, or try another 6J6.

The frequency of the oscillator may be checked in several ways depending on what is available in the way of test equipment. A calibrated receiver can be used to detect the oscillation and show its frequency. The surest system is to use a grid-dip meter operating as a wavemeter, or an absorption-type wavemeter with fairly accurate

calibration. The grid-dip meter will show output when coupled to  $L_2$  and tuned to the frequency of the oscillation. Tuning an absorption wavemeter coupled to  $L_2$  to the oscillator frequency will cause a flicker in oscillator plate current. At 220 Mc. it is also possible to use a Lecher wire system to measure the frequency as outlined in the measurements chapter of all recent *Handbooks*.

The oscillator should be adjusted (by  $C_5$ ) to tune below the desired signal frequency by the amount chosen as the i.f. For the 21-Mc. band the oscillator tunes at least 14 to 14.45 Mc. For 28 Mc. it should cover at least 21 to 22.7 Mc. For the 6-meter band it must tune 43 to 47 Mc., and so on. The trimmer capacitor,  $C_5$ , and, if necessary, the coil,  $L_2$ , are adjusted to set the oscillator to the proper range. Actually coverage will be somewhat more than the width of the band, and the desired range should be centered on the dial by varying  $C_5$ . The coverage mentioned above is obtained by rotating  $C_6$ , of course.

Now it's time to connect the converter output to the receiver antenna terminals. The converter is normally operated on top of the communications receiver, or close alongside it, in a convenient operating position. A coaxial cable is made up with a male phono-type coaxial fitting on one end, with enough cable to reach from the converter to the receiver antenna terminals. Most receivers have a three-terminal antenna connection block. One of these terminals is grounded. The middle one and the one at the opposite end from the grounded one are normally used for doublet antenna connections. Connect the middle one and the grounded terminal together, and make this combination the point of connection for the outer conductor of the coaxial cable. The inner conductor goes on the remaining antenna terminal.

The mixer plate coil,  $L_3$ , may be tuned to about 7 Mc. with a grid-dip meter, or it can be peaked on noise with the receiver set at this frequency and the converter running. The grid circuit,  $L_1C_1$ , may be checked with a grid-dip meter. It may also be peaked for maximum response to a signal generator connected to the

*(Continued on page 122)*

**QST for**

# Wait and See

BY ROBERT D. REED,\* WSKY

PEOPLE have a peculiar ability which probably is the world's best method for an adult to get his left foot into his right ear by way of his mouth. This ability combines the faculty of speech with the idea that firm opinions on subjects are not only necessary but must be defended to the last ditch, the last shell, and the last 807.

*Genus Homo Sapiens (sub-phyllum Hammus Electronicii Radioicus)* is particularly adept at having opinions plus the ability to spray them loudly over the world by virtue of his super blaster-band ear buster running a jillion watts to a whang-doodler of an antenna which has major lobes in 360 directions. Defense of said ideas and opinions may be audible or by certain rhythmic undulations of the fingers in cooperation with a key.

It is a brave man who approaches Hammus with the idea of changing his opinion on: (1) politics, (2) religion, (3) the peerless qualities of his children, (4) the fire-snorting dash and performance of his Detroit gasoline-burner eight, (5) the best way to enhance further the state of ham-band QRM, and (6) either side of the s.s.b. vs. a.m. controversy. The amateurs doing the most and best with their hobby, we think, are those keeping clear of the fray. . . . It's best of all to wait and see.

He who ventures forth on any of the items from (1) through (5) is the victim of simple assault and can usually be patched up with some salve and a few bandages placed in strategic spots. But that number (6)! Murder and mayhem are mild in comparison with what happens to the innocent venturer forth on that subject. His antenna vanishes in a cloud of green smoke. His receiver melts into a blob of assorted steel, copper, glass and aluminum. The antenna relay breaks down and the surge into his transmitter completely discombobulates it back to the VFO.

Old Growler, licensed prior to 1920, sagely nods his head when he hears such goings on. Listen carefully as he mumbles softly to himself. Long, long ago he learned of the hazards of speaking loudly about differences of opinion.

Heh! Heh! Beats all how history repeats. Like in the early Twenties, just like 'em! When I think how brave those little 210s and VT1s and VT2s were as they looked the kilowatt sparks straight in the eye with their innocent little chirps, I'm surprised all over again. It took a whale of a lot of convincing for me to get it into my thick skull that a little five- or ten-watt chirp could run circles around my big old spark rig. It didn't seem possible that something that just sat there and glowed could work. Seemed as if it just had to make some noise. But I was young then, and pretty dad-burned stubborn. (Got my come-

uppance though just as lots of young fellows now-a-days might get theirs.)

Never will forget the night that Old Joe called me on the land line to ask me to take a look at his new 210 rig. It was cold and clear and signals



were rolling in like mad. Old Joe had moved his rig into the kitchen, now that the rotary gap didn't make so much household QRM. His XYL met me at the door and took me to the kitchen where Old Joe grinned at me over the coffee pot and waved me to a chair beside him as he threw the switch to the "transmit" position.

As he tapped out the call of the station he was working I nearly fell off of my chair! He was working more than 1800 miles with that quiet little fugitive from an electric light factory! I had thought Old Joe was kidding but I sure got convinced when he turned it over to his contact. By gum, he *was* in contact with him!

I had planned to stay just a little while and then get back to the home rig to stop fooling around and work some DX. Seems funny now but DX to me with my old kilowatt spark was about 1000 miles. This business of working 1800 miles needed looking into. So I looked, but did I catch it from the XYL when I got home in the wee small hours. She even smelled my breath to verify my story.

That night of DX in the pleasant warmth of the kitchen at Old Joe's made a cautious convert of me to the tune of a 210, some coils, condensers and such, which I tied to my antenna. My little chirp added to those already hunting for better and better DX. I had to learn to tune my receiver all over again and learn how to get away from pesky capacity effects which came as I reached for the dial to touch up the receiver. I learned! But in the meantime, dust began to gather on the old spark rig.

After a few weeks, Old Bill, who had a spark like mine across town, was having coffee with me at the local beanery. He was not as free and easy with me as he used to be. I found out what was wrong when I began to tell him about that innocent looking little 210 and the contacts I was

(Continued on page 124)

\* 4339 S. Peoria, Tulsa 5, Okla.

# Tuning the Mobile Antenna from the Driver's Seat

## *A Simple Remote Tuning System*

BY FRANK T. MORGAN,\* W7RFG

• Various items from military surplus units can be combined to provide a means of easily resonating the mobile whip antenna from the driver's seat.

THE writer has expended his share of time and energy in trying out the usual arrangements of mobile installation — transmitter under-dash mounting and trunk mounting, antenna with base loading and center loading, direct coupling and the tapped-coil method (shunt feed), and the usual array of tuning slugs and capacitive hats. The result was considerable frustration and a family gas buggy with enough holes in the body to make a car dealer shudder.

For ease of operation, it was finally decided that the transmitter had no place in the trunk, but belonged up front in constant range of the operator's hand and eye. Furthermore, after shattering an overhead fluorescent lamp in a filling station one night, with a cowl-mounted job, the antenna was transferred to the rear bumper as the only safe place for an 8-ft. whip.

The ability to QSY more than a few kilocycles on any band with such an arrangement was a hopeless dream, nursed in despair for a long time. The usual procedure is to tune up before the car is put in motion, and then stop a couple of times to adjust the antenna to compensate for the change in capacitance as the wind bows

\* Route 2, Box 42, Myssa, Ore.

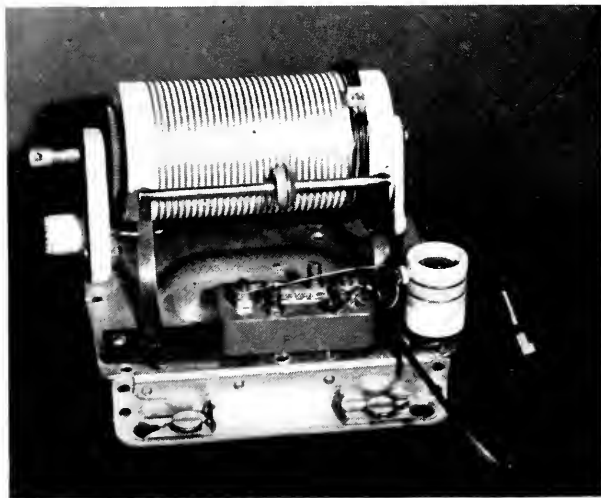
the whip backward. When it is desired to QSY, the procedure must be repeated. (This sort of stuff can lead to divorce if the XYL is along expecting an uninterrupted Sunday drive.)

### *A Convenient Tuning System*

The remote tuner described has solved this problem well, and the author is now at peace with himself and the family. No cross words from the XYL, even after miles of rag-chewing on 75 meters. The antenna is tuned by a variable inductor connected at the base of the antenna, and driven remotely from the driver's seat by means of a flexible shaft. The number of turns needed to cover the 75-meter band is so small that it has little effect on the performance of a center-loaded antenna. Some commercially manufactured tuners, similar in principle, employ reversible d.c. motors for rotating the coil. If a suitable motor and reduction gears are available, fine, but for economy and downright simplicity, the flexible shaft is hard to beat.

To facilitate accurate and easy tuning, a resonance indicator that may be placed within view of the operator is included.

The tuning mechanism consists of the rotocoil and associated rider, springs and a bakelite strip taken from the antenna circuit of a BC-696. Since only about 12 turns are required to cover the band, the coil from a BC-457 may also be used. The BC-696 is often converted for 75-meter components may be simply transferred from the BC-696 to the antenna tuning unit. A coaxial



The remote antenna-tuning unit, showing the mounting of the link coupling coil. The thermocouple for the r.f. ammeter and its pick-up transformer are in the foreground.

cable is then used between the antenna tuner and the output link of the BC-696.

The BC-442 Command antenna-relay unit (another available surplus item) offers a meter with an external thermocouple that can be used in the remote resonance indicator. If the mounting plate for the BC-442 can also be obtained, it makes an ideal mounting for the tuning unit that can be removed simply by releasing the four slip catches which clamp on the shock mounts.

### Construction

To begin the construction, completely dismantle the BC-442, and remove the studs to which the cover is fastened, by twisting them out with pliers. The studs on the flanges under the base plate were left intact so that a cover could be mounted over the assembly in case trouble developed from dirt on the rider contact. So far this has not happened. It will be found that when the coil is mounted with one side flush with the edge of the base, and the bakelite mounting strip for the rider and springs is mounted about  $\frac{1}{4}$  inch in from the opposite side, the rider will fit the coil with about the right amount of tension. The rider-spring mounting screws pass nearly through the bakelite strip. The chance of a short can be reduced by mounting the strip over a sheet of mica, fiber or pasteboard cut to size.

It will be observed that the ungrounded, or floating end of the coil has a pressed aluminum mount. This plate is large enough to accommodate a coax receptacle if one of the four corners is sawed off flush with the threads. It was feared that the plate would be twisted or weakened if the receptacle were mounted in the usual manner, so a  $\frac{7}{16}$ -inch hole was drilled for a center, and the fitting mounted flush against this support.

To the coil hub at this end is soldered a short length of brass rod to which the flexible shafting can be connected with a small coupler. This hub looks something like aluminum or pot metal, but it is actually tinned brass and solders very easily if a heavy soldering iron is used.

The pick-up transformer,  $L_1$ - $L_2$ , for the resonance indicator consists of one turn of wire on each coil, wound on a ceramic form around a powdered iron slug. This transformer is mounted at the end of the bakelite strip, near the ground end of the rotocoil, with a machine screw passed up from below the base. The thermocouple can be mounted directly over the rider-spring strip, between the two springs. The mounting screws will have to be slightly longer than the ones that originally mounted the thermocouple. One turn of the transformer is connected between the cold end of the rotocoil and ground. The other turn is connected to the thermocouple terminals marked "line." Use a small solder lug on the wire going to the rotocoil.

### Matching

In matching the antenna to the line, several methods might be used. The author has tried

paralleling two or three lengths of RG-8/U to reduce the line impedance. While a match can be obtained in this manner, difficulty is usually encountered in getting sufficient coupling from the transmitter output to such a low-impedance line, especially with the pi-section output circuits

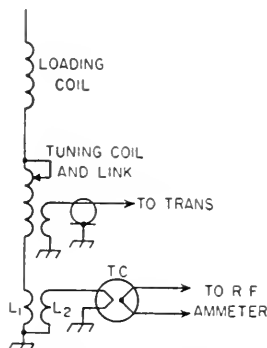


Fig. 1—Schematic of the remote antenna tuning system. TC is an external thermocouple for the r.f. ammeter mounted on the instrument panel.  $L_1$  and  $L_2$  form the pick-up for the r.f. ammeter.

so popular in manufactured mobile rigs. Shunt feed with a separate matching coil at the base of the antenna is feasible, but the most simple and satisfactory arrangement tried consists of a link coil coupled to the ground end of the rotocoil.

In constructing the coupling link coil, it was found that 3 turns of No. 14 could be fashioned so that when one end is grounded, and the other end fastened to a  $\frac{1}{2}$ -inch stand-off insulator, no other support was necessary. A more rugged and professional-looking job might be done by fastening the turns together at several points with sealing wax or poly spacers. The link is mounted so that it clears the rotocoil by about  $\frac{1}{16}$  inch, and the turns are spaced about the same distance. The link should overlap about 5 turns at the end of the rotocoil. It will be necessary to remove the solder lug and lead to the thermocouple transformer, and also the end mounting of the rotocoil in order to slip the link coil over the rotocoil. A short length of stranded wire is soldered to the lug on the end of one of the rider springs, and a small banana plug is soldered to the other end to connect to the antenna mount.

### Installation

The unit described is small enough that it can be mounted in the trunk, close to the base of the antenna, without interfering with the use for which the compartment was intended. A ground should be made to the car body with a short length of copper braid.

The flexible shaft and tuning head from an SCR-183 were used to drive the coil. This was passed forward under the car and up through a hole under the front seat. The tuning head was mounted on the hump in the center of the floor,

(Continued on page 126)



# "Little Oskey"—A Monitoring Oscillator and Keyer

## *A Simple C.W. Break-in Monitor and Code-Practice Oscillator*

BY E. LAIRD CAMPBELL, W1CUT

• This is a versatile auxiliary unit that will be welcomed to many an amateur shack. Without modifying a receiver or cathode-keyed transmitter in any way, and without the need for extra r.f. pick-up, it blanks the receiver and injects a sidetone in the headphones when the key is down. It can also be used as a code-practice oscillator, on those occasions when you can't find anyone to QSO.

SEVERAL different methods of c.w. monitoring have been tried at W1CUT. The first, and most simple, involved lowering the gain control of the receiver to a comfortable level while transmitting. However, even with the gain turned down it was difficult to reach a pleasant listening point, and constant adjustment was required. If the station being worked happened to be off the transmitting frequency, it was impossible to monitor without retuning the receiver to the transmitted signal.

The second method for c.w. monitoring made use of a crystal diode to rectify r.f. from the transmitter. The rectified voltage keyed a neon bulb audio oscillator and produced a sidetone. This system proved unsatisfactory because severe TVI was produced by harmonic generation in the crystal diode.<sup>1</sup> Since the r.f. for the unit was obtained from a pick-up wire near the final amplifier there was the danger of high voltage, and when changing bands it was necessary to alter the position of the pick-up wire to obtain sufficient r.f. to operate the unit. Since none of the above monitoring systems proved satisfactory, it was decided to construct a break-in monitor which basically had two jobs to perform. When

<sup>1</sup>"Harmonic Radiation from External Nonlinear Systems," *QST*, January, 1953.

the key was down the receiver output would be completely squelched and a sidetone would appear in the headphones, and when the key was up receiver output would be fed through to the headphones. Provisions must also be made for:

- 1) No adjustment when changing frequency or bands.
- 2) Installation in station without revision of transmitter or receiver.
- 3) A sidetone that is keyed exactly as the transmitted signal.
- 4) Keying the transmitter and sidetone simultaneously.
- 5) Mixing the outputs of the receiver and sidetone oscillator.
- 6) Electronic switching from sidetone to receiver output.
- 7) Switching the monitor out for the purpose of zero-beating another signal.

The monitor described here can perform all of the above jobs. Since the unit needs no external excitation, it can also be used as a code-practice oscillator.

### *Circuit and Construction*

No special precautions are necessary in laying out the unit. In fact, the monitor may be built in a cabinet and placed alongside of the receiver. When wiring the unit, it is a good idea to keep the leads carrying a.c. away from the amplifier input to prevent hum. Care should also be taken when soldering the crystal diodes. Holding the diode leads with a pair of long-nose pliers while soldering is good insurance against ruining a crystal. Terminal strips can be used conveniently for mounting parts such as the selenium rectifier and to serve as tie points for resistors, capacitors, etc.

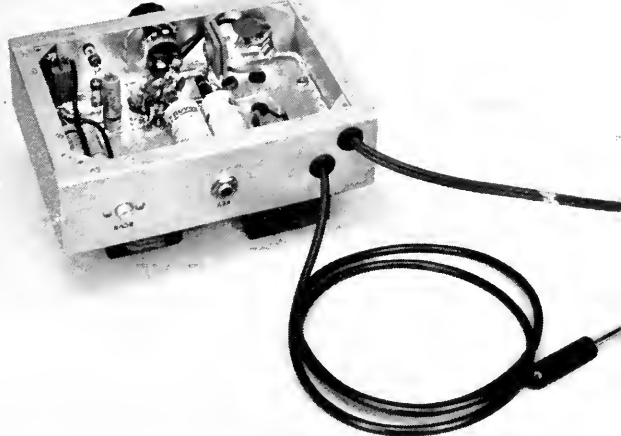
Two small 6-volt filament transformers connected "back to back" are used for obtaining

C.w. monitor and code-practice oscillator.



**QST** for

Bottom view showing the connecting cable. The crystal diode voltage tripler can be seen in the upper left corner of the chassis.



the necessary operating voltages. A novel voltage tripler composed of one-half of the 12AU7 and two crystal diodes supplies the voltages for receiver squelching and the audio oscillator. This voltage is controlled by the transmitting key and is turned on when the key is closed. At this instant (when the key is closed) the sidetone is produced and the receiver is squelched by placing the negative voltage on the grid of the input amplifier tube. When the key is opened the received signal is amplified and heard in the 'phones, while the sidetone is off.

The frequency of the sidetone audio oscillator can be adjusted by changing the grid capacitor,  $C_1$ . If the audio oscillator fails to oscillate, the primary leads of the interstage transformer should be reversed.

High voltage is obtained from the 115-volt side of transformer  $T_1$ . This is followed by a selenium rectifier and  $RC$  filter which provides enough voltage for good amplification in the amplifier-mixer stage.

### Operation

It is a very simple matter to insert the monitor into an existing station. The cable from the unit is plugged into the keyed circuit and the receiver output and head-phones are plugged into the unit. Switch  $S_1$  is a s.p.s.t. switch on the volume control and is used to turn the unit off and on. If for some reason it is desired to operate temporarily without the unit (such as when zero-beating) the toggle switch,  $S_2$ , may be opened and

(Continued on page 128)

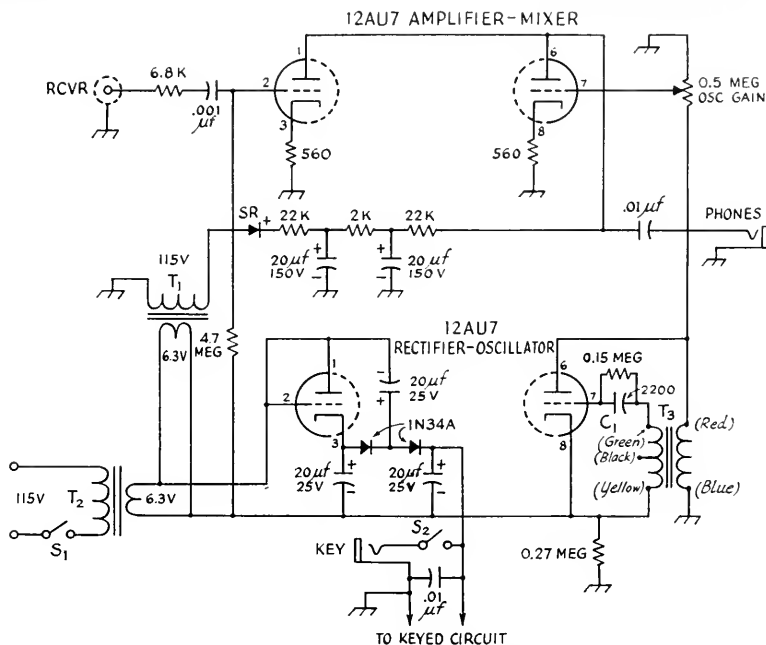


Fig. 1 — Schematic diagram of the c.w. monitor. All resistors  $\frac{1}{2}$  watt. All capacitors in  $\mu\text{f}$ . unless specified otherwise. The tube heaters get their power from the 6.3-volt line between  $T_1$  and  $T_2$ .  
 SR — Low-current selenium rectifier (Federal 1002).  $T_3$  — Interstage audio transformer, secondary-to-primary ratio 2:1 (Thoradson T-20A16).  
 $T_1$ ,  $T_2$  — 6.3-volt 1.2-amp. filament transformer (UTC FT-2).

## More Power with the AT-1

### Simple Modifications for Greater Output

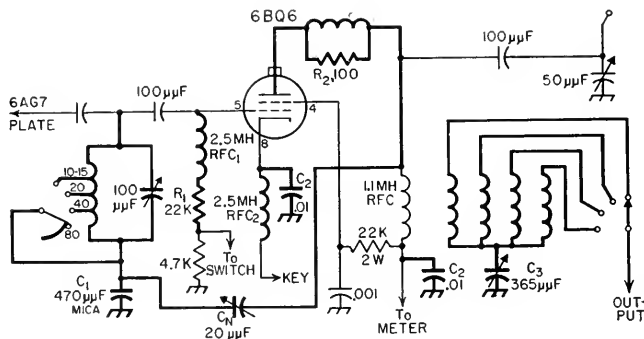
BY LEWIS G. McCOY, WHCP

• By a few simple modifications, the power output of the Heathkit AT-1 can be raised two to three times. Any Novice who has built the rig and used it long enough to become familiar with its operation should be ready for the slightly more complicated circuit. This article gives step-by-step directions.

**L**ISTENING to the Novice bands for a short time will quickly convince anyone the Heathkit AT-1 transmitter is a very popular item. As it stands, the rig will handle approximately 30 watts input on all amateur bands, 80 through 10 meters. Its amplifier works straight through on 80, but

having been designed for loads much higher than 100 milliamperes, will not deliver much more than 35 watts. The plate voltage drops as higher current is drawn and one runs into the law of diminishing returns.

In order to use the second stage as a straight-through amplifier it is necessary not only to install a neutralizing circuit but also to change the oscillator coil and switching circuit to permit tuning the amplifier grid and plate circuits to the same frequency. This should be done on all bands with the exception of 10 meters, where the change is not worth while because the oscillator cannot deliver sufficient grid drive on that band from a 7-Mc. crystal. If a 6BQ6 is to be substituted for the 6L6 — a change that is recommended, and



*Fig. 1* — Circuit diagram of modifications for the AT-1. The changes are shown by the heavy lines.

on all other bands it acts as a frequency doubler, presumably to avoid the necessity for neutralizing the 6L6. Although this results in a simpler circuit, it also means that the power output is considerably less than could be obtained from the same 6L6 as a straight-through amplifier.

To operate the amplifier straight through, the 6L6 (and practically any tube that might be substituted for it) must be neutralized to prevent self-oscillation. Neutralizing is neither difficult nor expensive, and the additional power output is certainly worth the effort.

Just how much the power output can be increased by such a change is shown by Table I, which gives the results of measurements made on a modified AT-1 *vs.* the unmodified unit. The table also includes data on a 6BQ6 which was substituted for the 6L6, this tube having been tried because its characteristics indicated that it should be a better performer than the 6L6. A 6L6 was also tried in the hope that its ability to draw large plate current with relatively low plate voltage would result in greater output but, unfortunately, the power supply in the AT-1, not

is included in the instructions below — the amplifier socket also must be changed.

### Other Modifications

In the original version of the AT-1, the output links are fixed, with no means provided for adjusting the coupling. According to the instruction manual, the links are designed to work into a 50-ohm load.

With certain types of antennas and antenna couplers, a fixed link may be OK for the job, but in many cases, it is well-nigh impossible to load the output stage to the normal input. A variable coupling circuit is therefore a very much worthwhile addition, and since it requires little more than adding an inexpensive variable capacitor, it is included in the modifications described below.

Another change that can easily be made consists of adding a resistor between the oscillator screen and chassis ground to help stabilize the voltage on the oscillator screen. This results in better keying characteristics.

The modifications described below are arranged in a series of steps, each numbered. The

component designations referred to are the same as those given in the original Heathkit instructions. The circuit diagram, Fig. 1, is the modified circuit showing only the information necessary for the changes. A list of material needed for the modifications is given elsewhere in the article.

Oscillator Modifications

- 1) Unsolder the leads from SB1, 2, 3, and 4.
  - 2) Unsolder the lead from XC1 to CO1 and also the lead to CO2A. Unsolder the leads from XC1, 2, 3, and 4 and clean the solder from the terminals.
  - 3) Remove CO from the panel.
- Note: In some of the AT-1 units the oscillator capacitor is insulated from the panel while in other models the rotor shaft of the capacitor is mounted directly on the panel. If your unit is the type with the insulated mounting, you can omit Step 4 and the use of insulating washers described in Step 7. (Check parts list for correct type of capacitor needed.)
- 4) Enlarge the panel hole for capacitor CO to 1/2-inch diameter.
  - 5) Drill a 1/8-inch diameter hole in the chassis top one inch in from the panel and one inch to the left of the large opening in the chassis.
  - 6) Mount a one-lug terminal strip at this new hole.
  - 7) Mount the new 100-μf. variable in the position formerly occupied by CO using an insulating washer on each side of the panel.
  - 8) Unsolder the end of the oscillator coil winding from terminal No. 1.
  - 9) Unwind the top turns from the coil down to the first tap point but do not remove or cut the wire; then drill or punch a small hole in the coil form approximately 1/4 inch below terminal No. 2.
  - 10) Unsolder the 2-wire tap from terminal No. 2 and solder the two wires to terminal No. 1.
  - 11) Wind three turns back on the form, and at the point where the third turn is opposite the new hole carefully scrape the enamel from the wire.
  - 12) Using a 3-inch piece of No. 18 tinned wire, feed the end of the wire down through the top of the coil form and out the new hole. Solder the end of the wire to the point where the enamel was removed from the third turn.
  - 13) Draw the other end of the wire through terminal No. 2 and solder to the terminal, trimming off any excess length.
  - 14) Wind the remaining wire from the coil back on the form and bring the end through the hole immediately below terminal No. 3, then dress the end of the wire over to and through the hole opposite terminal No. 2. This point will

TABLE I  
Measured Input and Output Power of the AT-1  
Before and After Modification

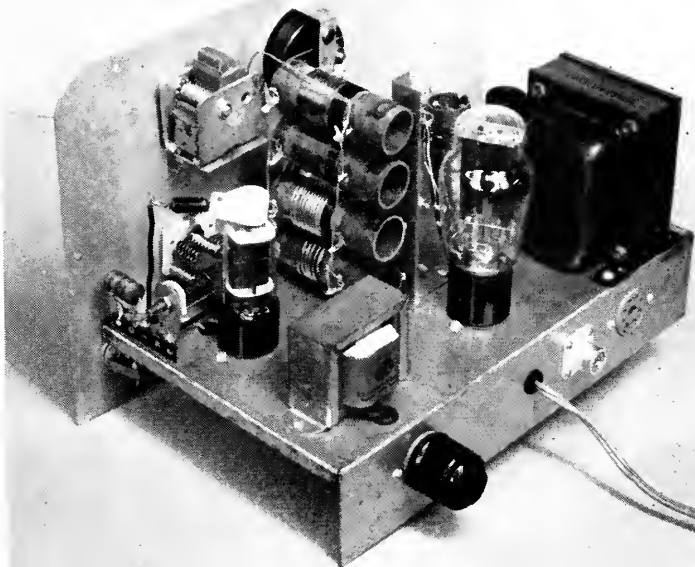
Band	6L6 Amp. Unmodified *		6L6 Amp. Modified		6BQ6 Amp. Modified	
	Input, Watts	Output, Watts	Input, Watts	Output, Watts	Input, Watts	Output, Watts
80	26	9	27	18	35	25
40	27	9	27	15	35	25
20	27	9	27	15	35	23
15	34	5	31	10	35	22
10 **	29	7	31	7	35	8

\* Output coupling not adjustable.  
\*\* The amplifier is a frequency doubler in all three cases on this band.

R.f. measurements made with a Jones MicroMatch, 260 series, power with the transmitter coupled to a 50-ohm resistive load. Power input in each case by actual measurement of plate voltage and plate (not plate and screen) current.  
Maximum plate current for the 6BQ6 is approximately 90 ma. With a plate voltage of approximately 400 volts, this gives an input of 35 watts. The screen current with this tube is very low so that the current registered by the AT-1 meter (which measures combined plate and screen current) is very nearly the same as the plate current alone.

- be designated terminal No. 5. This completes the coil modifications.
- 15) Mount the coil back in place.
  - 16) In the original instructions, Pictorial 1 shows a lead connected from SB3 to the tinned wire between TB2 and TC1. Unsolder and remove this lead (not the lead between TB2 and TC1).
  - 17) Cut an 8-inch length of No. 18 tinned wire and solder one end to the same point on the TB2-TC1 lead as the short piece formerly occupied.
  - 18) Bring the wire up through the large opening in the chassis and bend it toward the oscillator capacitor. The wire should clear the top of the chassis by approximately 1 1/2 inches. Dress the lead over to the stator terminal of the oscillator capacitor. Bend the wire at this point so that the end dresses up to XC5. Solder the wire at the stator terminal and to the end of the coil at XC5.
  - 19) Feed the end of a 9-inch length of tinned wire through XC4 over to SB4 and solder the end to SB4. Draw the wire tight and solder at XC4. Feed the free end of the wire

View showing the modifications of the amplifier and output circuits. The neutralizing capacitor is visible just to the left of the 6BQ6. The output coupling capacitor is at the upper left-hand corner of the panel.



through the insulated lug on the one-lug terminal strip mounted in Step 6. This lug is designated TP2. Draw the wire through TP2 and bring the end up to the rotor side of the oscillator capacitor. Slip a piece of spaghetti insulation over the wire and make it long enough to cover the wire between the rotor terminal and TP2. Solder the connection at the rotor terminal but not at TP2. The length of the wire between XC4 and TP2 should be dressed so that it does not touch nearby objects.

20) Connect one lead of a 470- $\mu$ mf. mica capacitor to TP2 and solder the other lead to chassis ground. The ground connection can be made at the screw which holds the TP2 terminal strip to the chassis.

21) Using short lengths of No. 18 tinned wire, connect one lead between SB3 and XC3, one lead from SB2 to XC1, and one lead between SB1 and XC2. Solder all connections and be sure that no lead touches another. This completes the oscillator modifications.

### ***Amplifier Modifications***

22) Remove the r.f. choke from between TC3 and Pin 3 of the 6L6 socket. Also unsolder the end of the 100- $\mu$ mf. capacitor from Pin 3.

23) Drill a  $\frac{1}{8}$ -inch hole in the chassis top  $\frac{1}{2}$  inch from the side and opposite the  $\frac{1}{2}$ -inch hole near the tube socket.

24) Mount a three-lug terminal strip at this new hole. The lug closest to the panel is designated TPA1, the middle lug TPA2, and the rear lug TPA3.

25) Unsolder the 47K resistor from B5 and TC2.

26) Unsolder the 0.001 capacitor from B8 and chassis ground. Also remove the lead from B8 to J1. Clean the solder from B8.

27) Cut the bare wire lead between B1 and B2 and clean the solder from B1. B2 is left connected to chassis ground.

28) Solder one end of a 22K  $\frac{1}{2}$ -watt resistor to TC2 and connect the other end to B1. Solder one end of a 2.5-mh. r.f. choke to B1 and solder the other end to B5.

29) Solder one end of a 2.5-mh. r.f. choke to J1 and connect the other end to B8. Solder one end of a 0.01 disk ceramic capacitor to B8 and solder the other lead to chassis ground.

30) Solder one end of a 0.01 disk ceramic capacitor to

chassis ground and connect the other lead to TC3. Solder one end of a four-inch length of insulated wire to TC3. Feed the other end up through the  $\frac{1}{2}$ -inch hole near the tube socket and connect it to TPA1.

31) Solder one end of the 1.1-mh. r.f. choke to TPA1 and connect the other end to TPA2. Connect the free end of the 100- $\mu$ mf. mica capacitor that is soldered to CA2A to TPA2.

32) Solder one end of a 13-inch length of No. 24 enameled wire to one lead of a 100-ohm 1-watt carbon resistor. Make the connection close to the body of the resistor. Be sure to scrape the enamel from the end of the wire before soldering.

33) Wind 14 close-spaced turns of the enameled wire on the body of the resistor and solder the end of the wire to the other resistor lead. Cut one resistor lead to  $\frac{3}{4}$  inch long and the other to  $\frac{1}{2}$  inch.

34) Solder the  $\frac{1}{2}$ -inch resistor lead to the ceramic plate cap for the 6BQ6. Solder the other lead of the resistor to the end of a 3 $\frac{1}{2}$ -inch length of insulated wire (see photograph). Connect the other end of the 3 $\frac{1}{2}$ -inch length of wire to TPA2.

35) Cut a piece of tin  $\frac{3}{4}$  inch wide by 1 $\frac{3}{4}$  inches long from a tin can. This will serve as a mounting plate for the 20M11 neutralizing capacitor. See Fig. 2 for details of this plate.

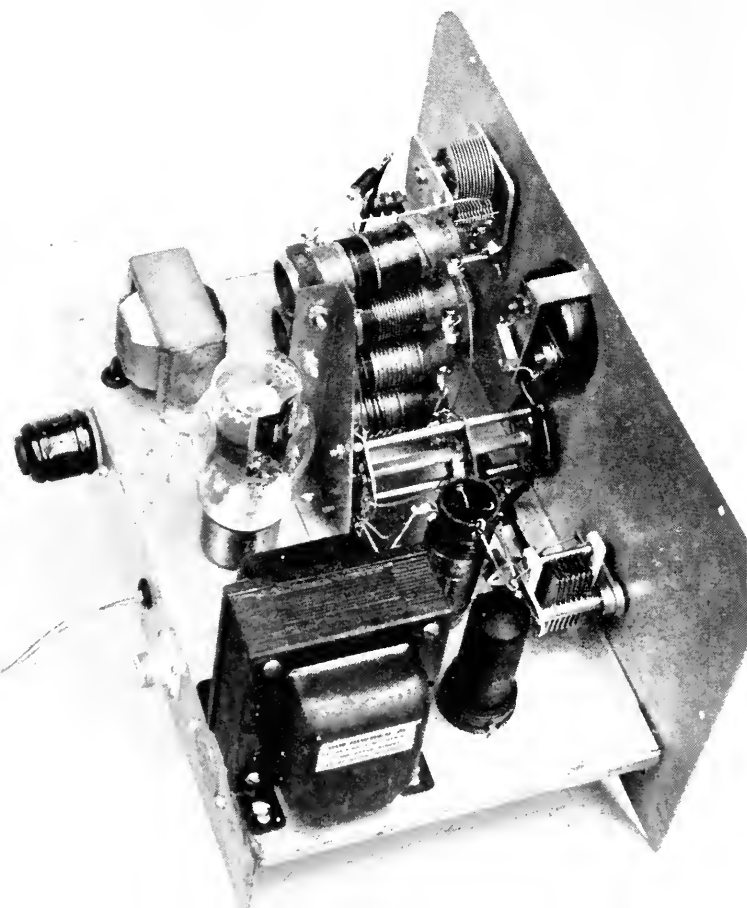
36) Mount the neutralizing capacitor on the plate using the shaft nut to hold the capacitor to the plate.

37) Cut a piece of No. 18 tinned wire 8 $\frac{1}{2}$  inches long and also a piece of spaghetti 7 $\frac{1}{2}$  inches long. Slip the spaghetti on the length of tinned wire.

38) Solder one end of the tinned wire to TP1, which is near the oscillator capacitor. Dress the wire above the chassis top and feed the end through TPA3 so that approximately  $\frac{1}{2}$  inch of wire extends through TPA3.

39) Mount the neutralizing capacitor plate against TPA3 by feeding the end of the tinned wire lead through the small hole in the plate and then bending the lead back around TPA3. Heat the connection and flow solder around the joint to insure a good connection.

40) Take a short piece of No. 18 tinned wire and solder one end to the stator section of the neutralizing capacitor. Connect the other end to TPA2. This completes the amplifier modifications.



The AT-1 shown here was the model that had the rotor of the oscillator capacitor grounded to the panel. The rotor is insulated by enlarging the panel hole and using insulated washers at the rotor mounting. Just above the oscillator tube is the lead from the stator of the oscillator capacitor to the new terminal XC5 on the oscillator coil.

## Output Link Changes

The variable capacitor,  $C_3$  in Fig. 1, can be one of the inexpensive broadcast replacement types.

The maximum capacitance must be more than 300  $\mu\text{f}$ . Because of manufacturers' variations in construction, the method of installation may vary in each case. In the unit described here, a  $\frac{1}{2}$ -inch hole was drilled in the panel  $1\frac{1}{4}$  inches from the top of panel and directly over the amplifier capacitor CA. A small aluminum bracket was made to hold the capacitor in place. The frame of the capacitor was mounted on the bracket with two small screws and the bracket mounted to the panel. The important thing to remember when mounting the capacitor is that the frame or rotor is grounded to the chassis and the stator is insulated from the chassis.

After the capacitor is mounted in place, the amplifier coil assemblies — 80C, 40C, 20C, and 10C — must be removed from their holders. The easiest method of removing them is to unsolder the leads on the 80-meter coil at Terminals 2 and 4 and then 1 and 3, working down in this manner until all coils are removed. The coils are then ready for modification.

41) Unsolder the link ends from Terminals 3 and 4 on 10C and remove the link.

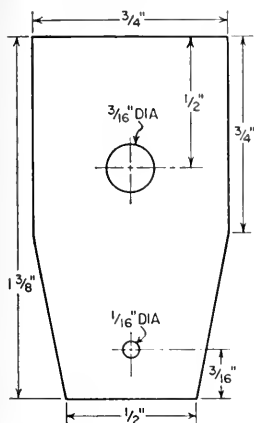


Fig. 2 — Details for making the tin plate for mounting the neutralizing capacitor.

42) Punch a small hole in the coil form between the second and third turns of the amplifier coil counting from the link end and on the same side of the coil form as terminal No. 4.

43) Using No. 24 enameled wire, insert one end of the wire through the new hole, bring the end up to terminal No. 4, and solder. Be sure to scrape the enamel from the end of the wire before soldering.

44) Wind  $2\frac{1}{2}$  turns of the No. 24 enameled wire on the coil form, the first  $1\frac{1}{2}$  turns being interwound with the amplifier coil in the same direction. Insert the end of the wire into the hole just at the end of the amplifier coil, feed the end up to terminal No. 3, and solder. Remount the coil in place but do not connect leads to terminals 1 and 3. Solder the leads from the switch to their original connections on terminals 2 and 4.

45) Unsolder and remove the link from terminals 3 and 4 of 20C. Wind on  $7\frac{1}{2}$  turns of No. 24 enameled wire using the same holes for the new link. Remount the coil, making connections to the switch leads but not terminals 1 and 3.

46) Using the same procedure outlined above, wind a new link on 40C consisting of  $12\frac{1}{2}$  turns of No. 24 enameled wire. Mount the coil back in place.

47) Do the same with 80C, the new link consisting of  $16\frac{1}{2}$  turns of No. 24 enameled wire. Remount.

## PARTS LIST

- 1 470- $\mu\text{f}$ . mica capacitor ( $C_1$ )
- 2 0.01- $\mu\text{f}$ . disk ceramic capacitors ( $C_2, C_3$ )
- 1 19.7- $\mu\text{f}$ . variable capacitor ( $C_N$ ) (Johnson 20M11)
- 1 100- $\mu\text{f}$ . variable capacitor (For stud mounting use Millen 22100, Cardwell PL-6017, or Hammarlund HFA-100-A. If either of the latter two types is used, the spacers must be removed from CO and installed on the new capacitor. For shaft mounting, use Hammarlund MC-100-M or MC100-S, Cardwell PL-6017, Johnson 100R12, or Bud MC1855. If a shaft mounting is used, two  $\frac{1}{2}$ -inch insulated washers with extruded shoulders will be needed for insulating the capacitor from the panel.)
- 1 365- $\mu\text{f}$ . single-section variable capacitor ( $C_3$ ), broadcast replacement type
- 1 100-ohm 1-watt carbon resistor ( $R_2$ )
- 1 22,000-ohm  $\frac{1}{2}$ -watt resistor ( $R_1$ )
- 1 69,000-ohm 1-watt resistor
- 2 2.5-mh. r.f. chokes ( $RFC_1, RFC_2$ )
- 1 6BQ6 tube
- 1 plate cap for 6BQ6
- 5 feet of No. 18 tinned wire
- 25 feet of No. 24 enameled wire
- 1 16-inch length of spaghetti insulation to cover No. 18 wire
- 1 one-lug bakelite tie point
- 1 three-lug bakelite tie point
- 2  $\frac{1}{2}$ -inch insulated washers with extruded shoulders (if needed for mounting the oscillator capacitor)

48) Using a length of No. 18 tinned wire, connect all the No. 3 terminals together and run the wire over to the stator of  $C_3$ , the series capacitor. Solder the end to the stator.

49) Connect all the No. 1 terminals together as originally wired.

50) Remove the lead that formerly connected 10C3 to chassis ground near the tube socket.

This completes the output link changes.

As the transmitter now stands, it can be operated straight through on all bands except 10 meters, where it is necessary to double the final.

## Neutralization

As mentioned earlier, neutralization is necessary to prevent self-oscillation of the amplifier. A 40-watt light bulb connected to the output terminal of the transmitter will serve as a dummy load for testing purposes. Connect the metal screw-base portion of the bulb to the chassis and the base contact to the inner conductor of the coax output socket. Plug a key into the key jack, an 80-meter crystal into the crystal socket, and turn the bandswitch to the 80-meter band. It will be easier to familiarize oneself with neutralization procedure by starting with 80 meters. With the key open, turn the rig on and allow it to warm up for a minute or two. Switch the meter to read grid current and close the key. Tune the oscillator capacitor so that the grid current is about 3 ma. and then switch the meter to read plate current. Tune the amplifier capacitor for minimum plate current and the dummy load should light. It will probably be necessary to adjust the output capacitor for maximum output. Regardless of the setting of the output coupling capacitor, always check the final plate tuning to make sure it is in resonance, as indicated by minimum plate current.

Switch the meter to read grid current and press the key. Remove the crystal from its socket

(Continued on page 130)

# • Recent Equipment —

## The GPR-90 Communications Receiver

**B**E it automobiles or communications receivers, interest always runs high when a new one is announced. Each year the new models are carefully scanned to see if, at last, "they" have built our dream car or dream receiver. But, dreams being what they are and, we hear, so widely diversified, there never will be a dream job that will match up with everyone's reveries. To be practical about it, one should look for the refinements and new ideas that add up to the evolution of this and next year's models.

The GPR-90 will serve as a good example. It is a two-dial receiver and it has double con-

The manufacturers of the receiver are new to the amateur field but not to the receiver-building game, since they have been building radio gear for the government and military for years. This experience is reflected in the GPR-90. There is a clean and refreshing look about the receiver and a quality about the finishes and wiring that one recognizes as the result of having to satisfy government inspectors and quality-control departments. The receiver looks as though it might stand some rough handling.

Electrically, you can get a fair idea in a hurry from the block diagram in Fig. 1. Hey! How

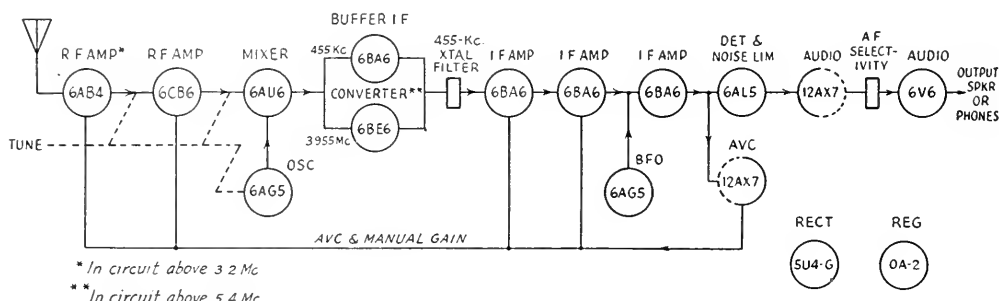
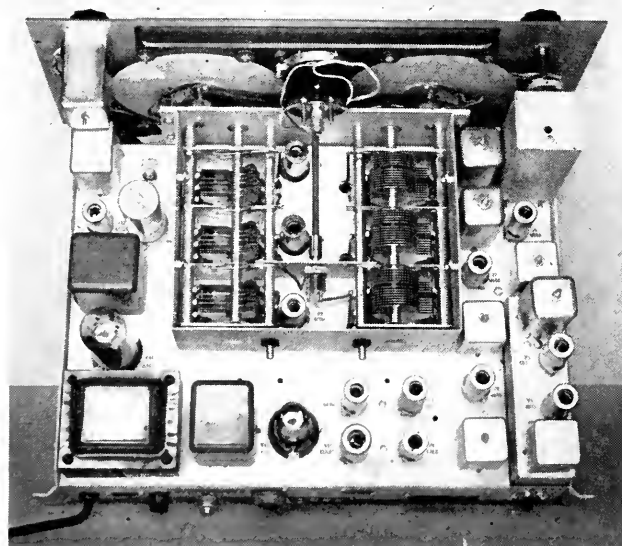


Fig. 1 — Block diagram of the GPR-90 communications receiver. Output impedance levels of 4, 8, 16 and 600 ohms are included.

version (above 3.2 Mc.), and in these two respects it might be considered not unlike a few contemporaries. But there is a lot more to it than that, as we found by digging around in the chassis and the wiring diagram.

about that 6AB4 r.f. amplifier — isn't its input circuit tuned?

The 6AB4 r.f. stage rates at least a separate paragraph. In the circuit, above 3.2 Mc., the grounded-grid 6AB4 amplifier is coupled to the antenna through a ferramic-core broadband transformer that provides two input impedance levels, 75 or 300 ohms. The sim-



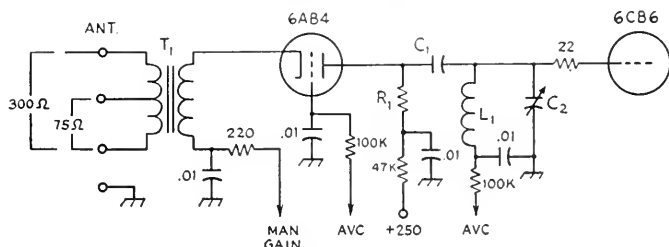
Top view of the GPR-90 with the dust cover removed from the variable-capacitor housing.



ranges it is switched into the 6BE6 converter stage. The grid circuit of the 6BE6 has three circuits tuned to 3.995 Mc., and its oscillator circuit is self-controlled. The manufacturer states that no appreciable improvement in stability could be gained by using crystal control at this point. With the 6BE6 converter active, the 6BA6 buffer i.f. is not used.

The crystal filter circuit is similar to that used in most receivers today, and has provision for five degrees of selectivity. The SELECTIVITY switch on the panel is marked in bandwidths at the - 3 db. points, and these range from 200 to

Fig. 2—Simplified schematic diagram of the grounded-grid r.f. stage used above 3.2 Mc.  $R_1$ ,  $C_1$  and  $L_1$  are switched for the various ranges and have different values on the various bands.  $T_1$  is the same on all bands.



2000 cycles. A sixth position on the switch cuts out the crystal filter and gives a 6-kc. bandwidth at  $-3$  db. and an 18-kc. bandwidth at  $-40$  db. The manufacturer's bandwidth curves show the  $-40$  db. bandwidth in the sharpest position to be 5 kc.

Following the crystal filter there are three i.f. stages. The first two are included in the gain-control circuits (cathode control for manual, grid

control for a.v.c.) and the last stage runs at constant gain. The b.f.o. is injected at the grid of the last i.f. stage, and there is also an i.f. take-off at this point for s.s.b. adapters and other accessories. The diode detector and automatic noise limiter (series diode) are conventional, but the use of variable audio selectivity is not. This consists of a parallel-tuned circuit peaked at around 1200 cycles. A variable resistor in series with the inductance allows the operator to change the  $Q$ , and consequently the selectivity of the circuit, from a sharp position that will separate the mark from the space signal of a teletype signal to a broad position that is useful for 'phone reception. The inductor is a toroid.

The receiver includes most of the auxiliary outlets found to be useful in present-day receivers: phono input, accessory socket, and even a utility a.c. outlet and a power plug for vibrator or battery operation.

The six tuning ranges of the receiver are 0.54 to 1.4 Mc., 1.4 to 3.3, 3.2 to 5.6, 5.4 to 9.7, 9.4 to 17.8 and 17.3 to 31.5 Mc. The band-set dial has an auxiliary scale that can be used for accurate logging of the settings necessary for ham-band operation or anything else, and for wide-range use following a 6- or 2-meter converter it was noted that it requires four knob rotations to cover 14.0 to 17.8 Mc. There are locks for both dials. Dial mechanisms are always interesting, we think — in the GPR-90 these consist of rim fric-

tion drive of the celluloid scales, from which a small gear drives a spring-loaded gear on the capacitor shaft. There are heavy flywheels on the knob shafts to furnish inertia for smooth tuning.

On the bandspread side,  $5\frac{3}{4}$  turns are required to cover 3.5 to 4.0 Mc.,  $3\frac{3}{4}$  for the 40-meter band,  $4\frac{1}{2}$  for the 20-meter band,  $2\frac{1}{2}$  for 15, and  $3\frac{1}{2}$  for 10 meters.

Mechanically, there are a few things in the GPR-90 that you don't normally find in communications receivers. One of the photographs shows the tuning capacitors — these are securely tied at two points to the heavy front subpanel and at no other point. An extension at the rear of each capacitor floats in a rubber grommet, and consequently it is difficult for any chassis deformation to be transmitted to the capacitors. We have seen receivers with the tuning capacitors bolted to the chassis that were very sensitive to chassis deformation — apparently the GPR-90 engineers have too. Frequent use of tie points and terminal boards underneath the chassis, and tube locks on the 5U4G and 6V6, reflect the government-specification work mentioned earlier. The components appear to be high quality: A-B type variable resistors, and ceramic insulation and air trimmers throughout the oscillator section are examples.

The GPR-90 is made by the Technical Material Corp., Mamaroneck, N. Y.

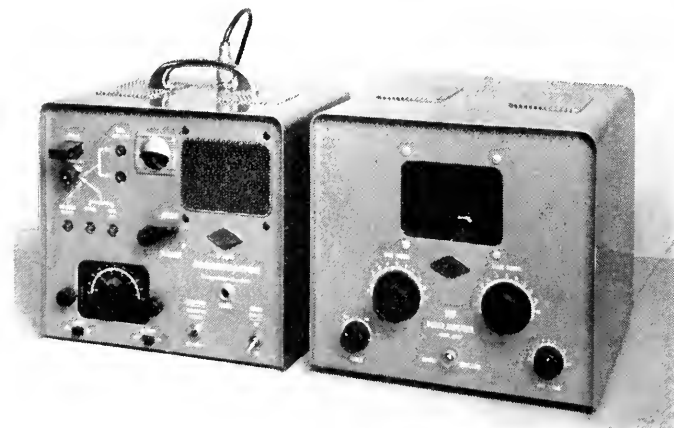
— B. G

## The Gonset V.H.F. Linear Power Amplifier

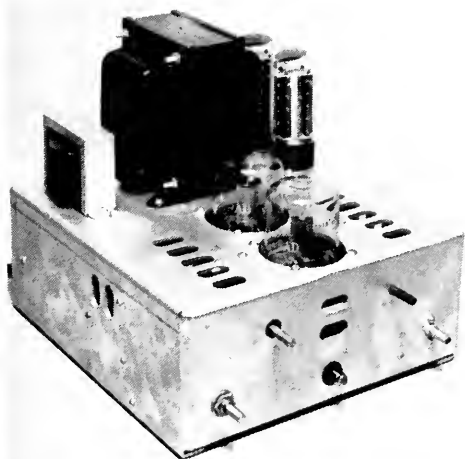
UNTIL the advent of single sideband, the linear amplifier was little known in amateur circles. Among v.h.f. men, particularly, the linear was almost unheard of, but here is a commercial product that seems bound to change all that.

The Gonset V.H.F. Linear Power Amplifier is designed as a matching unit for the popular Communicator, and it is available for either 50

or 144 Mc. When driven by the Communicator, or any amplitude-modulated rig of 3 to 6 watts output, the linear amplifier provides a power step-up of about 10 db., and it requires no additional accessories of any kind. It contains its own send-receive relay, so that the receiver of the Communicator can be used. Only two cables are required; one between the Communicator output and the amplifier input, and the other between the antenna relay and the receiver. These are furnished with the unit.



The Gonset V.H.F. Linear Power Amplifier, shown here with its companion unit, the Communicator, as a driver, is available for either 50 or 144 Mc.



The Gonset v.h.f. amplifier uses a pair of 826s, and has its own built-in high-voltage and bias supplies. Power output is about 50 watts, on voice, when drive is supplied by the Communicator or a similar modulated rig of 3 to 6 watts output.

The amplifier uses two 826s in push-pull. Plate voltage, between 1050 to 1100 under normal load, is supplied by a pair of 5U4GB rectifiers in series. Grid bias is obtained from a selenium rectifier. The send-receive relay is connected in the negative high-voltage lead, and is adjusted to close when the plate current of the 826s is 100 ma. or more. In addition to switching the antenna, the relay also shorts out a section of bias supply bleeder, decreasing the effective operating bias when the amplifier is being driven. Closing of the relay at about 100 ma. plate current means that a minimum of about 3 watts

of drive is required to operate the amplifier.

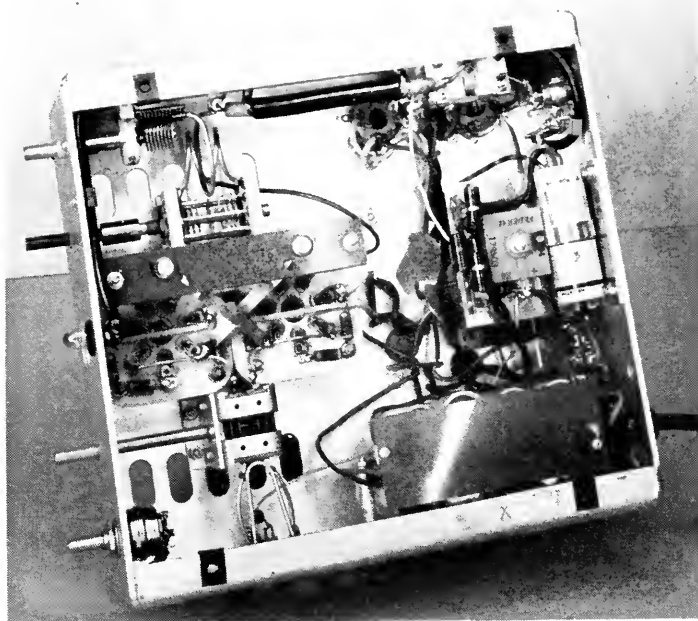
A meter jack is provided in the center tap of the 826 filaments, but a meter is not required for normal tuning or operation. A tuning lamp is coupled to the transmitter output, and the user merely tunes the various controls for the highest brilliance in the lamp that will allow upward modulation. This will be about 40 to 50 watts output, with the drive that is obtainable from the Communicator. If the amplifier is to be used for c.w. or f.m. service, it is merely adjusted for maximum tuning lamp brilliance as modulation capability is then of no importance.

The operator should also take note of the plate color of the 826s, and this is observed readily through a panel window. A tendency to run hotter than the normal cherry red is an indication of excessive grid drive. A 300-ma. meter should be plugged into the center-tap jack, and the drive adjusted until no more than about 225 ma. is indicated, corresponding to a driving power of about 6 watts.

*Safety note:* As soon as the operating switch is turned on, plate voltage is applied to the 826s. This makes operation of the unit outside the cabinet extremely dangerous, as the tubes themselves show no indication of plate voltage until drive is applied. There should be no occasion for operation of the amplifier with the cover removed. Neutralization, the only adjustment that is likely ever to be required, is accomplished through the bottom of the case, and no high-voltage circuits are exposed with the back cover removed. If you must look at "the works" be sure that the a.c. cord is removed from the outlet, and then short the plate coil to ground with an insulated screwdriver before touching any of the circuits.

— E. P. T.

Bottom view of the Gonset amplifier, 144-Mc. model. Grid and plate circuits may be seen at the left, top and bottom, respectively, of the tube sockets. Power-supply components are at the lower right, with the send-receive relay in the upper right corner.





# Hints and Kinks

## For the Experimenter



### WINDSHIELD-WIPER MOTOR FOR TUNING WHIP LOADING COILS

AN electric windshield-wiper motor, mounted adjacent to the base of a mobile whip, provides a convenient and inexpensive means of tuning a roller-type base loading coil. It is very easy to arrange for reverse rotation of the motor because the field winding is brought out to a switch. Wiper motors can usually be obtained from an auto junk yard for a dollar or two.

— Johnny Johnson, W2ZYX

### MOBILE ANTENNA MOUNTS FOR 144 MC.

THE antenna mounting bracket shown in Fig. 1 is made from a piece of 0.064-inch aluminum strip. It permits vertical mounting of a quarter-wave 144-Mc. whip and can be easily fastened to the rain trough, above a car door, by self-tapping screws.

The  $\frac{7}{8}$ -inch mounting hole at the top of the bracket will accommodate the base of a Master Mobile 2-meter whip. On the other hand, the bracket may be fitted with a Type S8-1J coax

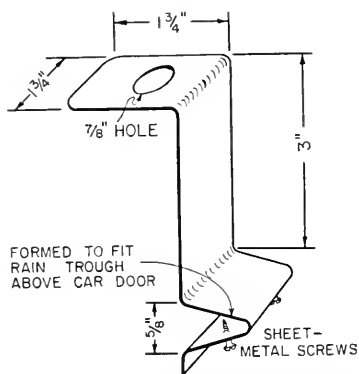


Fig. 1 — This simple homemade bracket mounts on the rain trough of a car and supports a 144-Mc. vertical whip.

adapter so that a homemade whip, based with a Type S8-1SP connector, can be quickly fastened to the assembly.

Fig. 2 shows a more complex but more efficient antenna mount. The base for the assembly, a rubber suction cup such as is used with car-top carriers, is fitted with a brass adapter (homemade) that mates with a Type S8-1T coax "Tee" adapter. The suction cup and the brass insert are fastened together with a flat-head machine screw. The head of the screw is covered with a fiber washer to prevent contact between the screw and the inner conductor of the Tee adapter. If the

inner conductor of the Tee is drilled out at the bottom end, it will not be necessary to use the fiber washer.

R.f. power is fed to the center tap of the Tee adapter via a length of RG-58/U cable, a Type

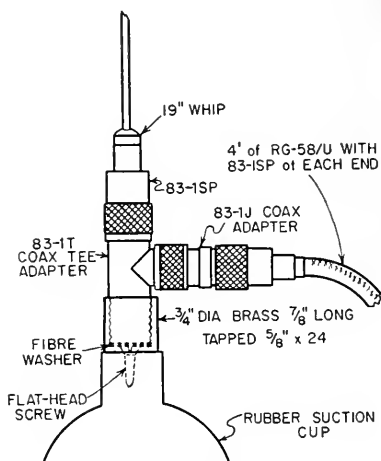


Fig. 2 — A simple but efficient method of mounting a 144-Mc. whip at the center of a car roof.

S8-1P plug and a Type S8-1J "straight" adapter. The 19-inch whip, equipped with a S8-1SP connector, mates with the top end of the Tee adapter.

Both of the installations are neat in appearance, can be easily mounted on the car, and permit rapid removal of the antenna. When mounting the system shown in Fig. 2, it is advisable to apply a thin film of glycerine to the inside of the cup before the latter is fastened to the roof of the car.

Incidentally, a gain in signal strength is evident when changing over from the rain trough to the roof-center mounted antenna.

— Gerald Bagdy, W2JUL

### OSCILLATOR MODIFICATION FOR THE "GLOBE SCOUT" TRANSMITTER

THE 6V6 oscillator tube in the W.R.L. "Globe Scout" transmitter requires more drive than some of the small VFO units will deliver. This condition can be quickly remedied by changing the oscillator tube to a 6AG7, as suggested to me by W1DJC. The oscillator tube socket must be rewired to accommodate the new tube, but it is not necessary to alter the basic circuit.

After the modification, the transmitter can be driven by a small VFO such as the Heathkit VF-1, and will work as well with crystal control as it did before.

— R. A. Laune, W1CDD

## 600-1200-VOLT POWER SUPPLY COMBINATION

WHILE building the "Final Rig" (that's the one that you think will be the last rig you'll ever build since it's going to have everything in

1200 volts at 250 ma. for the final r.f. section. Ordinary 807s won't take that sort of power so I used a pair of 4-65As. These tubes draw practically the same plate current over a wide range of plate voltages — ratings being 150 ma. each through the 600-1500-volt range. Screen voltage comes from the 250-volt supply used for the exciter and speech-amplifier sections.

— Howard J. Hanson, W7MRX

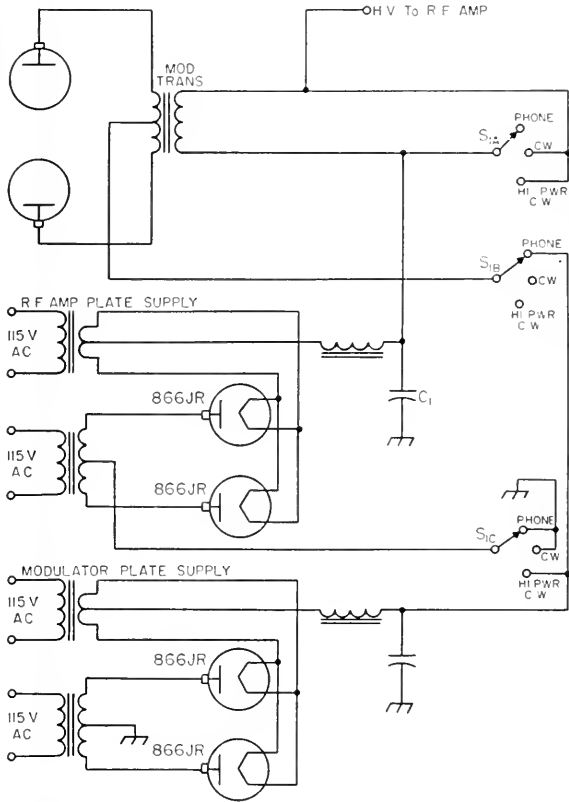


Fig. 3 — Circuit diagram of the 600-1200-volt power supply.  $C_1$  should be rated at 1500 volts or more.  $S_1$  is a 3-pole 3-position ceramic rotary switch. Power transformer ratings are discussed in the text.

it), I came up with the following gimmick which may be of interest to some rig builders.

Originally I planned to put a pair of 807s or equivalent tubes in the final, and so provided a 600-volt 250-ma. power supply for them. I also planned to use a pair of the same tubes as modulators, and provided a separate 600-volt 250-ma. power supply for them. After both power supplies were installed on the chassis and working, I considered the fact that half of my available d.c. power was unused on c.w. A little thought evolved the circuit shown in Fig. 3.

Basically, the control is a 3-pole 3-position switch. In the 'phone position it runs the r.f. section from one 600-volt supply, and the modulator from the other. In the c.w. position it removes plate power from the modulators and shorts out the secondary of the modulation transformer. In the third position, called hi-power c.w., it places the two 600-volt supplies in series, giving

## A TRANSISTORIZED OSCILLATOR FOR 3.5 MC.

HAMS have found many applications for junction transistors, even though many previous types have been limited to audio and intermediate frequencies. The most recent transistor is Raytheon's type 2N112 (formerly known as CK760). It has a cut-off at 5 Mc. and easily oscillates at 3.5 Mc. and above with only a 1.5-volt source of power.

The schematic in Fig. 4 is that of a simple oscillator useful at 3.5 Mc. and its harmonics. With a crystal inserted into the socket,  $C_1$  tunes broadly to the desired frequency. For VFO output, remove the crystal and insert a dummy crystal holder with its terminals shorted. Then  $C_1$  tunes the band with sufficient overlap at each end. The tone is T9 and remains steady as a rock after a minute or two drift.

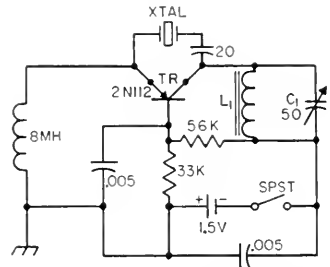


Fig. 4 — Circuit diagram of the transistorized oscillator.  $L_1$  is the plate winding of a broadcast-oscillator coil (Meissner 14-1058 or equivalent).

This circuit may be used as a signal generator for ham frequencies, calibration purposes or as an external b.f.o. for a short-wave receiver having no beat oscillator of its own. Simply tune the transistor circuit approximately to that of a c.w. signal. This creates a beat with the incoming signal. No need to alter the receiver.

The oscillator uses less than 0.5 ma. at 1.5 volts, but it can be driven safely with up to 6 volts.

— Nathaniel Queen, W2CPA

## ANOTHER SOURCE OF COIL FORMS

TWO TYPES of vials, used by druggists for packaging pills, make excellent coil forms of the inexpensive variety. Complete with plastic caps that may be used as mounting feet, the vials

come in two convenient sizes. One has a diameter of slightly less than  $\frac{7}{8}$  inch and the other is an even  $1\frac{1}{6}$  inches in diameter. Both types provide a winding length of  $1\frac{1}{2}$  inches. If a plug-in assembly is required, either form may be mounted on an old tube base or an octal plug. The caps can be pierced by a pin, scribe or other pointed object. A drill held by a pair of pliers may be used for drilling holes in the forms.

The vials are manufactured by Lerner of Garwood, N. J. My local drug store retails them at two for a nickel.

— Frank Heinfing, W2KKL

## RTTY REGULATOR CIRCUIT

IN the process of building an RTTY converter, I ran into trouble regulating the 60 ma. for the printer coils. The problem was solved by using the circuit shown in Fig. 5.

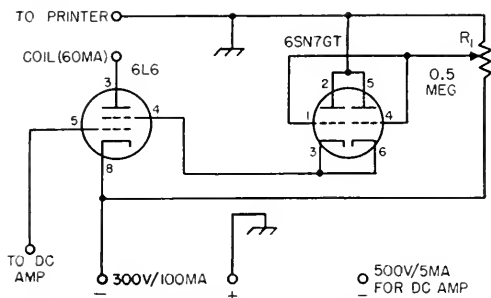


Fig. 5 — Circuit diagram of the RTTY regulator circuit.  $R_1$  should have a linear taper.

In operation, the parallel 6SN7GT acts as a voltage regulator for the screen of the 6L6, holding the screen voltage to very close limits regardless of screen current. Under these conditions, the plate-current vs. plate-voltage curve of all beam power tubes comes into effect, thus holding the current in the plate circuit to the value selected by adjustment of the 0.5-megohm potentiometer. In practice, I found that the addition to the circuit of two more printing coils (1500 ohms each) plus 700 ohms of line dropped the printer current not more than 2 ma. The arrangement helped to straighten out the inductive lag in the build-up of the 60 ma. It almost completely removes the mark bias previously present.

The circuit works directly into the printer coil without using the polar relay. I did this because the only polar relay on hand was bad and couldn't be quieted down. However, after using this for keying, I will never use another polar relay. No filtering whatever is necessary, and there is just that much less equipment to give trouble. The polar relay was never intended to be used for RTTY or short-haul work in the first place. Its intended use is on long lines where the excessive capacity results in a delay in the mark without a corresponding delay in space. The polar normally works into a circuit where the line furnishes 25 ma. plus for mark and 25 ma. minus for space. Thus any delay or other distortion on mark will

be matched by a corresponding distortion on space, which can be compensated for in the adjustments in the relay. All this is unnecessary for RTTY or short-haul work.

Notice that the power supply used with Fig. 5 is connected with the plus side grounded (for safety reasons) and that it also furnishes voltage for the d.c. amplifier.

— Eugene Austin, W0LZL

## RE THE THREE-WAY SWITCH FOR THE SIMPLEST MODULATOR

SOME time ago, one of my students installed a circuit similar to the one shown on page 36, *QST* for March, 1955. In doing so, the original cathode-to-ground lead, a short length of stout wire, was replaced by a pair of long leads running to and from the switch. His rig was thereby rendered inoperative because of instability. The problem was solved by connecting a 0.001- $\mu$ f. disk ceramic directly between the cathode terminal of the tube socket and ground. A simple point to be sure, but one that may easily be overlooked by inexperienced amateurs.

— John Dodge, W2MTQ

## HOMEMADE NEUTRALIZING CAPACITOR

A HOMEMADE neutralizing capacitor that has some advantages over commercially-made units is shown in Fig. 6. The method of construction permits bringing one terminal of the capacitor directly through a chassis, thus eliminating the extra feed-through insulator ordinarily required. The capacitor requires a minimum of

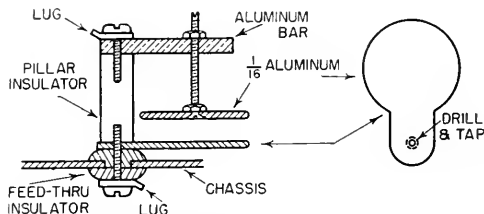


Fig. 6 — Drawing of the homemade neutralizing capacitor used by W1SIZ/6.

chassis area for mounting, and can be made to any desired maximum capacitance commensurate with high-voltage spacing requirements.

Capacitors of this type may be tailor-made for the popular capacitive neutralizing systems such as those described in Chapter Six of *The Radio Amateur's Handbook*.

— Thomas F. Snyder, W1SIZ/6

## MORE OUTPUT FROM THE HT-18

THE following may be of interest to those who use an HT-18 as an exciter. I have been able to boost the drive to an 813 by substituting a Type 6AK6 for the 6BA6 originally used in the VFO circuit. No change in the socket wiring is required. Also, the VR-105 voltage regulator has

(Continued on page 150)

# Happenings of the Month



## CONELRAD FOR AMATEURS

As previously reported in *QST* (p. 9, April, 1953; p. 46, August, 1954) the Federal Communications Commission has been in process of bringing the amateur radio service under a radio security system called "Conelrad" (for CONtrol of ELEctromagnetic RADiation). Its purpose is to shut down amateur radio stations — except RACES stations — in the event of enemy attack, so that no navigational aid may be available to enemy aircraft. The system has already been put into effect in many other radio services. On August 31st FCC issued proposed rule-making to add the amateur service, the text of which appears below. Any comment must be filed by October 3rd.

As an inspection of the text will show, amateurs will be required to have some means of knowing whether a radio alert is in process. Since a principal means of dissemination of the alert is by standard broadcast stations (as well as FM and TV), monitoring a near-by b.c. station either aurally or with a simple visual indicator will undoubtedly be the simplest solution. *QST* will carry information on appropriate methods in future issues; see also p. 17, September, 1953.

### Before the FEDERAL COMMUNICATIONS COMMISSION Washington 25, D.C.

In the Matter of

Amendment to Part 12 of the  
Commission's Rules and Regulations } Docket No. 1148S  
to Effectuate the Commission's  
CONELRAD Plan for the Amateur  
Radio Service }

#### NOTICE OF PROPOSED RULE MAKING

1. The Commission has before it the approved CONELRAD Plan for the Amateur Radio Service. This plan was developed in coöperation with licensees, amateur radio organizations, the Department of Defense and the Office of Defense Mobilization. In order to put this plan into effect it is necessary to modify Part 12 of the Commission's Rules and Regulations as set forth in the attached Appendix.

2. These proposed amendments are promulgated by authority of Sections 303(r) and 606(e) of the Communications Act of 1934 as amended and Executive Order No. 10312 signed by the President December 10, 1951.

3. Any interested party who is of the opinion that the proposed amendment should not be adopted or should not be adopted in the form set forth herein may file on or before October 3, 1955, a written statement or brief setting forth his comments. Comments in support of the proposed amendment may also be filed on or before the same date. Comments or briefs in reply to the original comments may be filed within one week from the last day for filing said original comments or briefs. No additional comments may be filed unless (1) specifically requested by the Commission, or (2) good cause for the filing of such additional comments is established. The Commission will consider all such comments that are submitted before taking action in this matter, and, if any comments appear to warrant the holding of a hearing or oral argument, a notice of the time and place of such hearing or oral argument will be given.

4. In accordance with the provisions of Section 1.764 of the Commission's Rules and Regulations, an original and 14 copies of all statements, briefs, or comments shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION  
MARY JANE MORRIS  
Secretary

Adopted: August 31, 1955

## APPENDIX

It is proposed to amend Part 12 of the Commission's Rules by adding the following new Sections:

### CONELRAD

12.190 *Scope and Objective of CONELRAD.* CONTROL of Electromagnetic RADIATION applies to all radio stations in the Amateur Radio Service and is for the purpose of providing for the alerting and operation of radio stations in this service during periods of air attack or imminent threat thereof. The objective is to minimize the navigational aid that may be obtained by an enemy from the electromagnetic radiations emanating from radio stations in the Amateur Radio Service while simultaneously providing for a continued service under controlled conditions when such operation is essential to the public welfare.

12.191 *The CONELRAD RADIO ALERT* is the term applied to the Military Warning that an air attack is probable or imminent and which automatically orders the immediate implementation of CONELRAD procedures for all radio stations. The CONELRAD RADIO ALERT is distinct from the military or Civil Air Defense Warnings YELLOW or RED, but may be coincidental with such warnings.

12.192 *Reception of RADIO ALERT.* (a) The licensee of a station in the Amateur Radio Service is required to provide a means for reception of the CONELRAD RADIO ALERT or a means for the determination that such ALERT is in force.

(b) All operators of stations in the Amateur Radio Service will be responsible for the reception of the CONELRAD RADIO ALERT or indication that such ALERT is in force by:

- (1) reception of a CONELRAD RADIO ALERT MESSAGE which will be broadcast by each standard, FM and TV broadcast station on its regular assigned frequency before they leave the air; or
- (2) reception of standard broadcast stations operating under CONELRAD requirements during the period of the ALERT on 640 or 1240 kc; or
- (3) determining that an ALERT is in force by lack of normal broadcast station operation (observations made before amateur station operation is begun and at least once every ten minutes during operation thereafter will be considered as sufficient for compliance with this Section); or
- (4) other means if so authorized by the Federal Communications Commission.

12.193 *Operation During an ALERT.* During a CONELRAD RADIO ALERT the operation of all amateur radio stations, except stations in the Radio Amateur Civil Emergency Service (RACES) and stations specifically authorized otherwise, will be immediately discontinued until the RADIO ALL CLEAR is issued. Stations in the RACES and such others as are specifically authorized to operate during the ALERT will conduct operation under the following restrictions.

- (a) No transmission shall be made unless it is of extreme emergency affecting the national safety or the safety of life and property.
- (b) Transmissions shall be as short as possible.
- (c) No station identification shall be given, either by transmission of call letters or by announcement.

(Continued on page 148)





# Correspondence From Members -

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

## AMATEUR'S CODE

Editor, *QST*:

Paul M. Segal's Amateur's Code is worth-while. Here's another way of putting it:

Amiable  
Moderate  
Alert  
True to ARRL (high fidelity)  
Energetic  
Useful for self, church, community, country  
Refined — pure in taste, mind and morals.

— Rev. M. Finnegan

P. O. Box 26  
Chauvin, La.

## SAYING IT WITH WORDS

7528 Tripp St.  
Skokie, Ill.

Editor, *QST*:

Aren't you guys getting a little stuffy in that rarified West Hartford atmosphere? While I agree with your Q-R-Mary editorial in the August issue of *QST* on the abuse of phonetics, I'm out of phase with you when you criticize the use of Q signals in 'phone conversation.

Every profession, racket, sport or hobby has its own lingo, including Hamdom. Verbal use of the Q code is no more reprehensible than a doctor referring to an "OB" case; a policeman mentioning a "B of I" record; or a soldier talking about his "ID" card.

What's wrong with a 'phone man saying: "Sorry, buddy, but the QRM got you that time. If you can QSY up a kaycee or two, maybe we can continue this QSO. If I don't hear you again, don't forget that QSL. My QTH is okay in the callbook." What's so bad about that?

Assuming the other guy has been a ham for at least a week, I'm sure he would know what I was talking about. And if he didn't, he'd look up those Q signals in a hurry. How would he ever use them on c.w. if he didn't know what they mean on 'phone?

If you're really serious about this, you'd better start revising your own *Handbook*. The terms BCI, TVI, VFO, r.f., i.f., and so on, are used rather profusely. To quote your own editorial: "Say it with words."

— Spencer Allen, W9JGL

P. O. Box 188  
Chester, Vt.

Editor, *QST*:

... I think that misuse and excessive use of phonetics in the 'phone bands may be due to several factors.

Most of us began as SWLs, and when we got our tickets we fell into the habits of those we listened to. Once we were on the air we tended to perpetuate the habits because those with whom we talked had themselves been "trained" and in turn passed along their methods of operating, which we aped.

Most important is the tendency of any group of persons engaged in a specialized operation to develop a "lingo" of "trade talk" for intercommunication. But whereas such specialized speech often serves continuing needs in trades, in ham radio time-saving c.w. abbreviations have been adopted by 'phone men as a sort of badge of the amateur. In using phonetics they feel more like their conception of what a ham should sound like; it makes them feel that they now belong to the fraternity. This tendency can be heard by listening to those hams newly bitten by the "traffic bug" who phonetize all over the place and adopt a clipped, terse, snappy delivery in imitation of what they believe to be the "best" communications style. These hams, in turn,

are heard by SWLs who, admiring the "professional" technique, become conditioned and thus perpetuate the system when they become hams.

In this manner the cycle continues. At worst, excessive phonetics annoy those who abhor wasted time and inefficiency. At best, they satisfy those using them that they are "real" hams.

The least that all of us can do in any contact is to size up the situation quickly at the beginning, use phonetics where confusion might arise, and speak normally and distinctly throughout the contact. . . .

— Jerome S. Miller, W8IDP/1

1130 Martin  
San Jose, Calif.

Editor, *QST*:

So you do not go for "Queen-Roger-Mary", etc. Don't blame you. My pet peeve is the guy that says "hi hi" and then laughs out loud! It really sounds silly.

— Robert F. Davis, W6HAN

## SHADES OF THE WOUFF HONG

P. O. Box 59  
Beverly Hills, Calif.

Editor, *QST*:

In the August issue of the *American Heritage* there is an article on the early days of radio as told by several of the men who were in at the beginning, including former President Hoover who, as Secretary of Commerce, had much to do with formulating the laws and regulations governing communications.

I quote the following from this article:

"The small boys in radio were a constant interest to me. Having their own wave band they had established an association of radio amateurs with whom we dealt constantly.

"One day I asked them how they were going to deal with enforcing the assignments of their wave band to prevent interference.

"The president of the association said, 'Well, I don't think you'd like to know what we do.'

"'Oh, yes,' I said, 'I would.'

"He said, 'Well, we just take the fellow out and beat him up.'"

The mystery of the Wouff Hong finally solved!

— John I. Wright, W6JPA

## 25 YEARS OF ENJOYMENT

D.O.T. Radio Range  
Graham, Ont.

Editor, *QST*:

I am a Full Member of the American Radio Relay League having had my first subscription to *QST* about 1930. Thank you for all the enjoyment that I have received from your magazine in the past, and for what the ARRL stands for. I doubt very much whether we would have been able to enjoy the finest of hobbies throughout the years had it not been for the loyal stand for the amateur's best interests which the League has always taken.

— G. E. Taylor, VE8BNJ

## MORE ON SYMBOLS

67 Broad St.  
New York 4, N. Y.

Editor, *QST*:

The several letters published in *QST* regarding the new standard graphical symbols are most encouraging for

although they object to a change they find little fault with the symbols themselves.

It is curiously human that while we all insist on being proponents of progress, we view with great suspicion any new proposal that will make us act or think differently than in the past. We are all too willing to declare such proposals to be the act of some hidden despot for certainly it cannot be progress if we must change. Fortunately, time heals all wounds, even those inflicted by standardization.

Ever since the first cave man selected those stones that fitted most comfortably into his hand and consequently made the best weapons, we have had standards. His hand became a rough "go - no go" gauge. Since then, standards, both written and unwritten, have provided us with simple routine answers to questions that are met frequently. They are, in effect, a set of habits that we purposely set about to learn because we know we will benefit from them.

The whole structure of amateur radio is based on standards, some of which are purely legal but most of which are arbitrary. The frequency bands in which we operate, types of emission, maximum power, the telegraph code, abbreviations and Q signals, operating procedures, and a host of other everyday things are carefully planned standards, seldom of the amateurs' making and changed as time and conditions dictate. . . .

— Harold P. Westman

903 Derrer Road  
Columbus 4, Ohio

Editor, *QST*:

. . . MIL-STD-122 obligates those of us who earn our dough in making electronic equipment for the services to use the new and "distasteful" symbols. Most of us don't draw enough schematics as hams in this era of store-bought equipment to become rapidly accustomed to any change. I personally allowed myself one frightful grimace and then got busy getting used to them. I don't believe the majority of guys would seriously want to stick with the old symbols if they knew that the commercial designers are switching over. How do the "die-hards" propose to convert to ham use the dandy BC-1099785 they'll buy surplus in 1960 if it's diagram is expressed in symbols used only by the commercials? . . .

— Charles C. Miller, W8JSU

## A KIND OF PLAGUE

504 N. Michigan  
Glendora, Calif.

Editor, *QST*:

Not long ago I became aware of a special type of operating that couldn't be blamed entirely on lid operators. After much research into the matter I found that this person was a sufferer of that dreaded disease, Vacume Cranium Callites, which is especially contagious to new operators.

I have mentioned below some of the easily recognizable symptoms and simple cures.

The symptoms are:

- 1) Spasmodic sending often bearing a resemblance to CQ.
- 2) A jumble of dits and dahs (his call) interspersed once every 1½ to 2 minutes.
- 3) A break for listening every 5 to 7 minutes at which time the sufferer of this terrible malady sometimes musters the strength to tune 2 kc. each side of wherever his receiver happens to be set.
- 4) If he does happen to hook up he never sends each call less than 5 times at the beginning and end of each transmission.

Cure:

- 1) Sending in step with an ARRL practice tape.
- 2) Get a free copy of *Operating an Amateur Radio Station* from the ARRL.
- 3) Examine your operating practice.
- 4) Use your head.

— John McHann, KN6KNF

## DX-CURED HAM

APO 102  
San Francisco, Calif.

Editor, *QST*:

Greetings from Korea, "the land of the morning calm." In my visit to this lonely far eastern peninsula I have dis-

covered a cure for the despised DX hog which, I believe, surpasses even the wrath of the Old Man or the fearsome Rettytsnitch.

The picture: The QTH here is within shouting distance of such prefixes as VS1, 2, 4, and 6, VKs, KL7s, KAs, KRrs, JAs, VU2, AC4, and Europeans and South Americans by the dozens along with many others. Most of these are heard regularly on 20- and 40-meter 'phone and c.w. with S9-plus signals and no, repeat no, QRM from W stations.

The rig here is a BC-610 with 500 cool watts, and the receivers are a pair of Collins 51Js. Antennas are your choice of doublets cut to frequency, long wires, or verticals. There are also plenty of high mountains for those who dream of stacked rhombics, etc. The emission is on 'phone, c.w., or RTTY for those guys who like to have a big TFC count. In addition, the entire rig is mobile on a large truck with a 10-kw a.c. generator if you like a change of scenery from time to time.

The qualifications: All you need is a hoggish interest in working DX and a Signal Corps high-speed radio operator's MOS, plus overseas orders for Korea. The orders are all too easy to get, hi.

The catch: Amateur radio operation with the Army equipment I just described is strictly illegal in Korea. So all you can do night after long, long night is just sit and listen while the rare DX booms in. (Unless you want to take a good chance of losing your rank, ham ticket, and about 10 years of your freedom by turning pirate.) They have monitor stations over here, too.

The cure: After 16 months of just listening like this and tearing your hair out you will become either: (1) a reformed man and honest DX chaser, (2) a drunken derelict, or (3) a babbling idiot. In my own sad case I already lean dangerously toward this third alternative after only a few months of exposure to this horrible cure. However, if I manage to survive these next crucial months I shall see you on 20-meter c.w. from the good old Stateside QTH. In the meantime, I can only hope that my poor miserable replacement will be the fellow that *QST* has voted as Mr. DX Hog of 1955.

— Ken Stewart, W4SMK

## BOOK BANTER

P. O. Box 662  
Nairobi, Kenya

Editor, *QST*:

Some little time ago I came across a copy of your *Radio Amateur's Handbook*—it was being used as a building block by a very young acquaintance. I rescued this somewhat tattered copy and at once realized that it was a masterpiece of ingenuity, organization and clarity. Being somewhat of an enthusiast at that time it became a sort of bible of radio to me. I can honestly say that I learned more from your book than from a collection of others costing some 30 pounds or so.

I have today, at great inconvenience, managed to secure your latest copy, an absolute gold mine, for 40 shillings. It seems to me that with the general run of such texts the author is at great pains to point out his own magnificent intelligence and learning. Teaching seems to be of secondary importance in spite of five or six pages in the introduction enlivened with persuasion to the contrary.

Why is it that American texts, I find, are so clear and concise, with an invaluable knack of guiding the seeker after knowledge painlessly on through the pitfalls of learning.

However, I have now donated the old copy to my African assistant who also aspires to be a radioman. The new copy could not be torn from me with wild horses.

. . . I wish you all the strength in the world and hope you will continue your work for many decades to come.

— N. G. A. Boreham

22 Green Acres Road  
St. Louis 15, Mo.

Editor, *QST*:

During the last few years I have collected and read, cover to cover, most of the League's major publications. The *Handbook*, for instance, is the bible of the amateur and those even mildly interested in amateur radio. But your v.h.f. section has been somewhat ignored in view of the recent swing to the higher bands.

It is my suggestion that the League publish an "ARRL

V.H.F. Handbook" and include in it the many articles that have been written about v.h.f. equipment in the last few years. I started to prepare a representative list of things that could be included, but gave up as it could really get to be monstrous. But sections on v.h.f. propagation, receivers, transmitters and antennae could certainly round out a good publication to say nothing of the advertising you could get from the many makers of v.h.f. equipment.

In short, I'd say that a v.h.f. handbook would be a worth-while addition to the League's fine line of publications.

I would appreciate any comment on my idea although I doubt if it is original with me.

— David Kelce

## AW, SHUCKS

P. O. Box 776

Dunedin, New Zealand

Editor, QST:

I have just read your editorial "Best Sellers" in April QST and it seems to me that you are too modest.

Can you think of any hobby other than ham radio, where that hobby's publication has become the "bible."

Go to any Air Force station, Army or Navy station, government radio station, or any government-owned communications department the world over; and there sits the "bible" known otherwise as the ARRL *Radio Amateur's Handbook*. No wonder you are nearing 3,000,000 copies with such recommendations. . . .

— William L. Shiel, ZL4AK

## LISTENER'S ADVICE

3127 N. 17 Dr.

Phoenix, Arizona

Editor, QST:

Re: SWL Davis' letter in July QST. Mr. David can get a 100% return to his SWL cards if he can perform only one feat — tell the amateurs just *one* good reason why they should waste their time and money! I agree wholeheartedly with VO2AW, having been deluged with SWLs myself. I think we hams should write SWL Davis saying, "I collect money. Please send me some." I wonder how many replies we'd get.

— Robert Fenwick, W7VMQ

P. O. Box 634

Espanola, Ontario

Editor, QST:

The two letters headed "Listener Reports" on p. 142 of the July issue of QST merit thoughtful consideration by all SWLs.

Since going to high power, a VO is deluged with SWL cards — worthless to him.

Meanwhile, an SWL on Guam says he doesn't have too much trouble hearing stations all over the world.

Now a little bit of evidence from me. I run a 30-watt Heathkit, and for the past few months have run an unsuccessful sked with a G. (I have had many W and VE QSOs, naturally.) I would like some evidence that my signal is going somewhere off this continent. In other words, SWL cards would be useful to me. Do I ever get any? Not on your life!

The moral, Mr. SWL, is that if you can "hear him without too much trouble," you won't get a card. Instead, learn code (10 w.p.m. is ample for this kind of thing) and dig down through the QRM and QRN to find the lower-power station who is calling CQ without success. He has a haunting feeling that, despite the tests he has made, and the winking of the neon bulb on the antenna tuner, he is not getting out. He will send you a grateful QSL — International Reply Coupon or not.

So, Mr. Davis, 14.02, Saturdays and Sundays, 1500-2000 GMT, for the first 1 minutes of the hour, if you really would like a VE card.

— F. P. Hughes, VE3DQB

## QSL PERCENTAGE

530 W. 10 St.

Juneau, Alaska

Editor, QST:

I have heard quite a few Ws complaining about DX stations not QSLing 100 per cent so I have made a list of per-

centages of W QSLs received here at KL7AQU. Here it is: W1 — 30%, W2 — 45, W3 — 75, W4 — 4, W5 — 25, W6 — 65, W7 — 60, W8 — 65, W9 — 30, W0 — 90.

This is from 2000 QSOs over a period of 2 years. I wonder how this compares with DX station QSL percentages. What say, Ws?

— Dennis O'Day, KL7AQU

## SKY'S THE LIMIT

Orchard Lane & Ellicott Rd.  
Philadelphia 14, Penna.

Editor, QST:

We have always read with considerable stimulation your extracurricula articles on the aurora borealis, meteor scattering and "Project Moonbeam" to mention a few. For those scientifically and experimentally minded we recommend Prof. Kraus' article on "Radio Telescopes" in the March issue of *Scientific American*. For those who like to build complex arrays, here they can find an array of dipoles 1500 feet long or a parabolic dish reflector 250 feet in diameter if they wish.

The fact that there are many stars emitting tremendous quantities of radio energy should open up a new field for the amateur experimenter, and as for one who feels like Colossus with his 1 kw., let him contemplate one of the objects in the sky called Cygnus A which astronomers estimate radiates in a single second enough radio energy to supply the earth's requirements of heat and power for the next trillion years if converted and translated to heat.

— F. M. Majewski, W3SQK

[EDITOR'S NOTE — Prof. Kraus is the W8JK of beam fame.]

## 22nd ARRL Sweepstakes — 12th-13th and 19th-20th

How many ARRL sections and how many stations in those sections can you work in two week ends? If you are located anywhere in the League's field-organization territory (see page 6), you are cordially invited to take part in this popular annual operating activity. Any amateur bands, 'phone or c.w., may be used. The total operating time allowed each contestant is 40 hours. 'Phone entries are compared only with other 'phone entries — c.w. scores only with other c.w. scores — in your particular section, in the competition for awards. The week-end periods starting Saturday afternoon (1500 PST or 1800 EST) on the 12th and 19th of November mark the open season for SS contacts.

A complete announcement of the contest, including the rules governing participation, will appear in November QST. The rules will be the same as those of the 1954 SS. Amateurs in remote ARRL sections who do not receive the November issue before the Sweepstakes may refer to November, 1954, QST for contest details.

Contest reporting forms will be sent to all amateurs who request them by mail or radiogram. It is not necessary to make advance entry or to use these forms, if the report form prescribed in November 1954 or in the next issue of QST is followed.

# YL NEWS and VIEWS

BY ELEANOR WILSON,\* W1QON

## YLRL Anniversary Party

The YLRL Sixteenth Anniversary Party is scheduled for Dec. 7th and 8th (phone) and Dec. 14th and 15th (c.w.). The contest will be held on week days this year instead of on week ends as in the past. New rules voted upon since last year's party will be followed. Watch for complete details next issue — but reserve the dates now!

## Field Day

Where were *you* on Field Day? Adding to the statistics and having a fine time doing it? A number of us did just that. There could have been more girls participating though — many more. Let's see what kind of Field Day story we *did* make in '55.

Headquarters YLs W1s YYM, Ellen, Z1B, Ann, and Z1D, Anne, boosted the score of the Laurel Amateur Radio Assn. (W1ICP/1) at Hartland Mt., Granby, Conn. Twelve-year-old WN1CDE, Marsha, was on hand to assist. . . . Working 20 meters under the call K4ACC/4 for her first FD, W4DBP, Jaunita, exclaimed, "Believe me! I will be back in there again next year. Didn't know anyone could have such fun." . . . President of the Elkhart ARC, W9MLE, Peggy, worked 80 and 40 c.w. with her outfit at a site near Bristol, Ind. . . . W9UNL, Lois, says she got in on FD by loaning her half of a generator, along with the OM's half, to the local radio club. . . . Fourteen-year-old K2DSL, Mercedes, con-



New officers of the San Diego YLRL are (l. to r.): President Mary Poe, W6MWU; V. P. Kathy Kreysler, K6AWP; Secy. Isabel McKenney, K6CAL; and Treas. "Billie" MacDonald, K6EOG.

cluded after a stint of operating with the Delaware Valley Radio Assn. that Field Day was so much fun that she wished "it were held every week instead of every year!" . . . OM K6DV reports that K6BGM, Caroline, operated with the Santa Clara County ARA, W6UW/6, atop 4400-ft. Mt. Hamilton, 50 miles south of San Francisco. . . . W9AQB, Norma, recovering from a recent illness, did some logging and made a few calls for the Michigan ARC. . . . W9LOY, Cris, operated 40' phone using one of the North Suburban (Ill.) Radio Club's ten transmitters. . . . The XYLs of the Tri-State Amateur Radio Society, TARS Auxiliary, devoted the week end to keeping their OMs well-nourished. From noon Saturday to finish time Sunday, the girls worked in shifts and served quantities of tasty home-style fare. Auxiliary President Dorothy McGuyer, XYL of W9DGA, remarked: "Besides being glad to help, this event is enjoyed by all. We do make a little profit and use it for entertaining our OMs."

Other YL FDers we've heard about were W1BCU, K4BNG, W5s KQG, WXT, W9s GME, JUJ, SYX, and W1QON. And credit is surely due that scores of loyal XYLs who packed box lunches for their OMs or who actually en-

\*YL Editor, QST. Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

Installed as new officers of the Chicago unit of the YLRL are (seated, l. to r.): Vice-Pres. Betty Dorsch, WN9YJC; Pres. Jean Essory, W9RPC; Secy. Betty Sandberg, WN9STR; Treas. Helen Kennedy, WN9MXI. (Standing): Publicity Chairman Grace Ryden, W9GME; Sergeant at Arms Dorothy Galitz; Board Director Eleanor Engbretsen, W9SEZ. Several members have received their tickets as a result of the club's training classes.



camped with their spouses and braved the rigors of cooking in the field alfresco. Reports of the usual W6 activity are missing this year, for an understandable reason. The YLRL's first International Convention was held in Santa Monica June 24th-27th. Plans for the affair had gone too far before the convention committee realized that it coincided with FD. If you were in there pitching and don't see your call in this account, send us the details. We'd like them for future reference.

Starting right now we're going to stump for more YLs working Field Day. From the standpoint of experience and sheer enjoyment, we just can't afford not to take part in Hamdom's most interesting annual activity.

See December QST for the complete tabulation of results and CU next FD for sure!

### New YLRL Net Schedule

Here is the schedule of nets registered with the YLRL for the 1955-56 term, as received from the YLRL Vice-President. Please address inquiries direct to Gloria Matuska, W9YBC, 2322 South Second Ave., North Riverside, Ill.

Freq. (kc)	Day	'Phone Time	NCS
3900	Mon.	3:00 P.M. PST	W7HHH; Alt.: W7NJS
3900	Wed.	8:00 A.M. EST	W1YPT
3900	Wed.	9:30 A.M. EST	W8ATB
3915	Wed.	9:00 A.M. PST	W6PJF; Alt.: W6GQZ
3970	Mon.	10:00 A.M. CST	W9UDU; Alts.: W9BFW & W9PIK
7215	Thurs.	9:00 A.M. EST	K2IWO
14,240	Thurs.	11:00 A.M. PST	W6UHA; Alt.: W1TRE
28,900	1st Tues. of month	9:00 P.M. EST	(not announced)

### 1955 AWTAR

For the fourth year the pilots who flew in the 1955 All-Women Transcontinental Air Race had the assistance of amateurs throughout the country. Race information, such as take-off and arrival times, weather conditions, progress reports, etc., was relayed by a network of more than one hundred amateur stations from the start on July 2nd at Long Beach, Calif., to the finish on July 6th at Springfield, Mass. Serving for the third consecutive term, Betty Gillies, W6QPI, was Air Chairman for the Ninth Annual Powder-Puff Derby. Eunice Gordon, W1UKR, headed amateur operations, with Viola Grossman, W2JZX, assisting her. Evelyn Scott, W6NZP, was again in charge of radio operations at Long Beach. Other Radio Chairmen at each stop-over city were as follows:

Blythe, Calif., W6FLD; Phoenix, Ariz., YL Janis Kennedy, W7PWU; Tucson, Ariz., W7LAD; El Paso, Tex., W5KBP and W5IAF; Midland, Tex., W5GGC and W5GOS; Wichita Falls, Tex., YL Garlena Powell, W5QJZ; Tulsa, Okla., W5PA; Springfield, Mo., W6HUI; St. Louis, Mo., W9YWL and W6MSX; Terre Haute, Ind., W9ZHL; Dayton, Ohio, W8FPZ and KL7PIV/WS; Wheeling, W. Va., W5PHY and W8KXD; Reading, Pa., W3PFT.

Others who assisted the various chairmen were W1KUL,

W3BN, W5UUR, W8DWT, W8YFX, W9DLS, W9VZC, W9PUS and YLs W2KEB, K6CPX and W6LMQ. Copy deadline prevents a complete list of participating amateurs in this issue.

Ninety-two participants flew in 54 300-horsepower-or-less aircraft. Flying a Cessna 180, Mrs. Frances Bera of Los Angeles, with her sister Mrs. Edna Bower of Long Beach as copilot, placed first in the handicap. The plane that placed third was piloted by W1YUO, Jerry Gardiner, of Waterford, Connecticut.

Portable or mobile stations operated directly from the airport at each stopover city. Conditions on 75 and 20, the two bands used, were reported very good by W1UKR, who actually lived at the Barnes-Westfield Airport for six days. Operators at Springfield monitored on 20 meters the take-off at three-minute intervals of the planes from Long Beach.

At a post-race banquet, members of The Ninety-Nines, Inc., sponsors of the race, expressed their appreciation to Eunice for the valuable assistance that the amateurs had given to them. The husband of one of the flyers remarked: "I used to have to sweat it out, not knowing where my wife was, nor how she was progressing. Now, thanks to you hams, I can literally follow her every mile of the course."

### Miscellany

Emergency Coördinator W5LGY, Helen Douglas, wonders how many other YLs are ECs too. A provocative query! Drop us a card and let us know if you hold the appointment — and if you don't, why not consider the job? Here's another chance to render amateur radio and your community valuable service.

Yes, she is — a licensed YL, that is. Her call — W5IOZ; her age — ten young years. Paula Bettis of McAlester, Okla., passed her Novice exam last November and received her Conditional Class license in June. A member of the Texas YL Round-up Net, her small voice can be heard on 75 regularly.



The office of secretary-treasurer in the YLRL has been split. W3VLX, Lolly Keller, 3316 Unionville Pike, Hatfield, Penna., is now secretary; W9MMT, Marie Ellis, 531 Cowan St., Ft. Collins, Colo., is Treasurer.

YLRL President W9LOY announces that W4SGD, Katherine Johnson, Box 414, Fuquay Springs, N. C., succeeds W7GLK as YL Century Certificate Custodian. (Complete rules for the YLCC award were in August, 1955, QST.)

WAC/YL Certificate No. 2 has been issued by the YLRL to ZL1BY, William A. Wilson. Certificate No. 1 is held by

(Continued on page 144)



Rosita will never get her own ticket but occasionally she transmits a yelp or two during her mistress' QSOs. In the photo W8HUX is persuading her Mexican chihuahua to display her ability for W8RZN and W8MBL. Marvel, seated, Dorothy, left, and Marie, right, are three well-known Toledo YLs.

QST for

# • Technical Correspondence—

## TRANSISTOR TRANSMITTER DX

4815 S.W. Patton Road  
Portland 1, Ore.

Technical Editor, *QST*:

From the standpoint of interest in the use of transistors on the amateur frequencies, I submit the following for whatever value it may have.

Using a transistor and running 1.8 mw. I worked the following stations:

August 22nd — W7DIS, Portland, Ore., approximately 2 miles air line.

August 23rd — WN7AAV, Salem, Ore., approximately 45 miles air line.

August 24th — W7TNF, Astoria, Ore., approximately 85 miles air line.

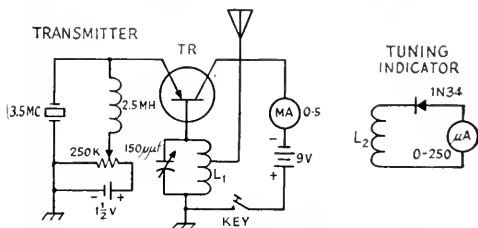
The transistor transmitter is crystal controlled on 3701 kc. The W7DIS and W7TNF QSOs were arranged, but the WN7AAV QSO was not. The reports were W7DIS, 339; W7TNF, 449; WN7AAV, 369.

On August 25th, contact was made with W7WPR, using the transistor, running 2.5 mw. input. W7WPR is in Seattle, Washington, approximately 200 miles away, and a 459 report was received. He was receiving me on an SX-25 receiver and a folded-dipole antenna.

The transistor used in this circuit is a Motorola type XN-2 PNP junction transistor. It is primarily designed to operate at frequencies around 455 kc., but experiments have shown that it operates very satisfactorily at frequencies in the 80-meter band.

Maximum (absolute) ratings of this transistor are:

Collector volts	minus 10
Collector current	minus 2 ma.
Collector dissipation	20 mw. at 25 degrees C



The transistor transmitter at W7UUZ uses a Motorola type XN-2 PNP transistor.  $L_1$  tunes to 3.5 Mc. with the capacitor fully meshed.  $L_2$  in the tuning indicator is a 6- to 8-turn pick-up loop.

Tuning the transistor transmitter is relatively easy, and the only precaution worth mentioning is that the collector current must not exceed the maximum ratings of the transistor used. To preclude this possibility, the arm of the potentiometer should initially be at the ground end.

The tuning procedure then is first to turn the receiver to the frequency of the crystal used. Apply the collector voltage (make sure that the arm of the potentiometer is turned to the grounded end). Turn the potentiometer up until the milliammeter reads approximately  $1\frac{1}{2}$  ma. Then tune the tank condenser until maximum current is indicated (do not exceed 2 ma.). If it starts to go over 2 ma. return the arm of the potentiometer closer to the ground end (this much will indicate that the circuit is oscillating). Connect the antenna and go through the same procedure, always being careful not to exceed the maximum ratings of the transistor (tests have shown that in c.w. service currents of up to 4 ma. will not harm a transistor of this type).

Because of the small available output I found that it was very difficult to tune the antenna to resonance. Using a few turns of coil with a 1N34 diode and a 0-250 microammeter makes for a very sensitive tuning indicator. Loading of the tuning network with this gimmick will cause the circuit to go off resonance, and when the instrument is removed maximum transfer of the signal to the antenna has dropped off.

— Robert L. Ritz, W7UUZ



October 1930

... Exhorting in "The President's Corner," Hiram Percy Maxim suggests that preparation be made for the upcoming International Radiotelegraph Conference to be held in Madrid in 1932. He urges that the League place a steady supply of amateur radio knowledge into the hands of those who will be delegates to the conference.

... "A Multi-Range Receiver with Four Tuned Circuits" is described by Robert S. Kruse, former *QST* Technical Editor. The unit features single-control tuning.

... Clark C. Rodimon, W1SZ, gives the latest dope on 28-Mc. activity and experimentation with "High-Frequency Notes."

... "Preparing an Article for *QST*," by James J. Lamb, *QST* Technical Editor, enlightens potential *QST* authors by "clueing them in" on just how it's done.

... "The Dynatron Frequency Meter," by George Grammer, W1DF, tells how to build, calibrate and use this modern measuring device. Generalized practical information on frequency-meter design and calibration is also abundantly presented.

... "How Our Signals Look," by Paul E. Griffith, W9DBW, lets the reader in on how a short-wave signal actually appears.

... Operated by Allen D. Gunston, W7GP is the station of the month. Mr. Gunston's rig uses a crystal-controlled transmitter employing two Type '10s, a Type '03A, and a Type '04A in the final. The antenna is a single-wire-fed Hertz and the receiver a remodeled commercial four-tube.

... A detailed discourse entitled "Neutralizing Radio-Frequency Amplifiers" is made by Robert T. Foreman, W9ZZE.

## HAMFEST CALENDAR

**NEW YORK** — The Federation of Long Island Radio Clubs is holding its annual Hamfest on Friday evening, October 14th, 8 o'clock, at the Lost Battalion Hall, 93-29 Queens Blvd., Elmhurst, L. I., N. Y. There will be exhibits, music for dancing, and areas set apart to meet special ham friends you've worked on the air. Tickets purchased in advance, \$2.00; at the door, \$2.50. Contact Robert I. Lippman, 30-51 Hobart St., Woodside 77, New York, for reservations.

**OKLAHOMA** — Another big general Hamfest & Auction on October 23rd at the New YMCA in Tulsa. There will be special entertainment for the ladies and noon dinner will be served on the spot. Total price per person is only \$2.00 advance registration, but \$2.50 at the door. Send all reservations to Norman Smith, W5EYK, 3210 South Cincinnati Ave., Tulsa, Oklahoma.

**WISCONSIN** — The Mancorad Radio Club, Inc., will sponsor the 1955 ARRL Wisconsin Section Meeting at its annual Fall Hamfest, to be held October 29th at the Lincoln Park Field House, Manitowoc, Wisc. Advance registration fee, \$2.00, includes dinner. Late registration fee, \$2.50. There will be an interesting technical program for OMs, and a special program for YLs and XYLs. For additional information, write Howard Hamann, W9RYV, 1340 North 9th St., Manitowoc, Wisc.

## ARE YOU LICENSED?

• When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.

# Annual Simulated Emergency Test

(October 8-9, 1955)

By the time this appears in print, all ECs, SECs, and SCMs will have received a copy of the "SET Bulletin" outlining details and last-minute instructions concerning the ARRL's annual Simulated Emergency Test. This announcement is for the benefit of all amateurs, so that you will know about the imminence of the test and have a general idea how it works and what to do if you wish to take part.

The SET is not a contest. It is the annual test of AREC facilities in conjunction with the principal agencies we serve. Each AREC organization will attempt to better its last year's score, so the scoring system will be the same as in previous years. Here's a brief run-down of how the SET works:

1) The EC calls a surprise alert of his AREC organization sometime during the October 8th-9th week end. If another date is more convenient for local reasons, such an exercise can be counted as the SET exercise. Conduct your drill on the designated week end if you can.

2) The group conducts a simulated emergency test under the EC's direction. The test may be slanted toward natural disaster (with Red Cross participation, if feasible) or enemy attack (in coordination with local civil defense). During the test, each local participant should dispatch a message in standard ARRL form to the EC, indicating his presence and availability, or anything else the EC directs.

3) The EC dispatches a message to ARRL Headquarters briefly describing the test and mentioning calls of participants.

4) At the EC's solicitation, the local Red Cross Disaster Chairman (or other official) dispatches a message to the American National Red Cross in Richmond, Va., via amateur radio, reporting Red Cross participation in the test.

5) Also at the EC's solicitation, the local Civil Defense Director dispatches a message by amateur radio to his State Civil Defense Director reporting civil defense participation in the test, if any. This is a job for the SEC and state or section traffic and emergency nets. A list of state directors is included in the SET Bulletin.

6) The local press is brought into the exercise for the maximum in publicity. ARRL sends out a publicity release, but your best publicity is generated at the local level. Invite the press to your exercise.

7) Some time during the October 8th-9th week end, a Test Emergency Alert (TEA) message will be transmitted on the National Calling and Emergency Frequencies. If you copy the message, send us a radiogram indicating you copied it (giving station from which copied, date, time and frequency), then send us a confirming copy of the complete message (not just the text) by mail, you'll get special QST mention in the SET write-up. Last year the message was sent by WIAW only once on c.w. and once on 'phone. This year we hope to have it sent more often, and by stations in the Midwest and Far West also, if possible. Keep your receiver tuned to one of the National Calling and Emergency Frequencies during the week end and you can't miss it.

8) After the test, the EC reports details on a form provided with the Bulletin. See that yours reports, so your work will receive credit.

WIAW and other stations operated by ARRL staff members will be active to take incoming traffic for ARRL.

Traffic for the Red Cross or state civil defense offices can follow regular routes, most of which are normally activated on Saturdays and will be activated especially on Sundays during the SET. If Amateur Red Cross Stations W6CXO (San Francisco), W9DUA (Springfield, Ill.) and W3PZA (Washington, D. C.) are able to be active, they can take traffic for American National Red Cross. If you cannot clear your hook on the NCE frequencies, try one of these: 3640 or 3880 (for Conn.), 3680 or 3835 (for Va.).

In Canada, Red Cross traffic should be forwarded to Canadian National Red Cross in Toronto, civil defense traffic to Provincial Civil Defense headquarters. Canadian ECs send their SET reports to ARRL, same as all ECs. Designated Canadian National Calling and Emergency Frequencies are 3535, 3765, 7050, 14,060, 14,160 and 28,250 kc.

If you are not already signed up in the AREC, now would be a good time to get lined up with your EC and start your public-service work right by participating in the SET. Why not look into it locally and see what's cooking? We'll tell you the name and address of your EC (if any) if you don't already know it.

See you on October 8th-9th in the SET, O.M.

## A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All you have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4 1/4 by 9 1/2 inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

- W1, K1 — D. W. Waterman, W1HPQ, 99 Flat Rock Rd., Easton, Conn.
- W2, K2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
- W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.
- W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
- W5, K5 — Oren B. Gambill, W5WI, 2514 N. Garrison, Tulsa 6, Okla.
- W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
- W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.
- W8, K8 — Walter E. Musgrave, W8NGW, 1294 E. 188th St., Cleveland 10, Ohio.
- W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wis.
- W0, K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.
- VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
- VE2 — Harry J. Mabson, VE2APII, 122 Regent Ave., Beaconsfield West, Que.
- VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.
- VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
- VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
- VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.
- VE7 — H. R. Hough, VE7HR, 2316 Trent St., Victoria, B. C.
- VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.
- VO — Ernest Ash, VO1A, P. O. Box 8, St. John's, Newfoundland.
- KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.
- KH6 — Andy H. Fuchikani, KH6BA, 2543 Namanu Dr., Honolulu, T. H.
- KL7 — Box 73, Douglas, Alaska.
- KZ5 — Gilbert C. Foster, KZ5GF, Box 407, Balboa, C. Z.

### NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C. W.		'PHONE	
3550	14,050	3875	14,225
7100	21,050	7250	21,040
28,100		20,610	



# How's DX?

CONDUCTED BY ROD NEWKIRK,\* W9BRD

**'Ow:**

When an unbeliever (stranger to amateur radio) pays a visit to your hamshack, chances are you're more than a little perplexed at the naïve questions put to you. One such BCL-type acquaintance of Jeeves' early Oxford gyp days called on us recently and performed true to this form. After those two well-qualified quidnuncs put the Boss's brandy stock to rout Jeeves brought the chap into our shack. Their disconcertingly discursive conversation took the following course. . . .

*Guest:* Good 'eavens, J.J. — 'ow far do you communicate with this curious apparatus?

*Jeeves:* Boundless, boundlessly far, Reginald. On a still evening we may be detected inside Outer Mongolia, you know.

*Guest:* 'Zooks! And you constructed this gadgetry entirely yourself, J.J.?

*Jeeves:* Not quite, old top. The factory, you know.

*Guest:* Those gaily-lettered pasteboards on the wall, J.J. — some sort of optometrical claptrap, what?

*Jeeves:* Oh, an uncommonly rare collection of long-distance QSLs, Reginald. Uncommonly rare. The Boss conducts a DX column — samples, you know.

*Guest:* I observed no aerial outside, J.J., yet I would imagine one should require an imposing structure to radiate such great distances. Incongruous, what?

*Jeeves:* The neighbors, Reginald — we had one up this morning. Moreover, the Boss is using his underground antennae for Ceylon. Straight down, you know.

*Guest:* Doubtless much power is consumed by this vast thingamabob. Expensive, what?

*Jeeves:* Righto, Reginald, the meter does whirl a bit. But not as furiously as formerly. Jumper, you know.

*Guest:* I once 'eard of a wireless chappie who made quite a nuisance of himself. Downright rum performance — 'arrased local video, the wireless, gramophones and what not. Are you faced with such a lot, J.J.?

*Jeeves:* A ripping amount once, Reginald, but negligible now. Silent hours, you know.

*Guest:* Wires, boxes, switches, valves and more wires! I say, J.J., 'ow do you manage to tidy it up?

*Jeeves:* Elementary, dear Reginald. I shove off into the cellar, open all switches and remove all fuses beforehand. Silent Keys, you know.

*Guest:* I say, J.J. old bean, my brother-in-law's solicitor's nephew in Sussex is a wireless bug. Do you suppose you could chat with 'im and permit me to shout a cheerio back 'ome? Do you really, now?

*Jeeves:* Nothing to it, Reginald. But as you do not know his call sign I shall have to call "CQ Reginald's brother-in-law's solicitor's nephew in Sussex." Beastly cumbersome, you know. . . .

Well, the imperturbable Jeeves had his usual smooth answer for everything but surely he was going overboard on that one. Visitors who have ham acquaintances they want you to contact on the spur of the moment without schedules, call signs or other clews — hah! Just "give Egbert a call and let me say hello to him." A million to one would be comfortable odds.

But would you believe it? After Jeeves completed a short "CQ Reginald's brother-in-law's solicitor's nephew in Sussex," back came a clipped British voice on the frequency saying, "... This is Reginald's brother-in-law's solicitor's nephew, G3ZZZ in Sussex, returning. Thanks for the call, you know." And Reginald, Jeeves and Egbert conversed amiably for the next two hours without batting an eye.

Anyone for the rest of that brandy? (Nerves, you know.)

**What:**

Reginald is back on the road for Schweppes now, and Jeevesie has his head down in the mailbag to see what the gang has to say this month. There are squeals of delight on all sides, we note, as we swing toward Old Sol's aene aene on pox peak. "Just had about 300 Stateside QSOs with signals running to 5 by 5 to 9 plus 40 db., the latter predominating — all around good Stateside QSOs." — *HZLAB* . . . "We've had several days of wonderful long-path propagation lately." — *ZD6BX* . . . "Twenty sure is hoppin' these days (for a change)." — *W2BRV* . . . "Very good night openings to Europe for two to four hours at a time and some nights the band is wide open all night long — guess that's a big improvement over last year at this time." — *W6GFB*. And so it goes!

**20** 'phone is all the rage with pukka DX available in quantity. W9EU successfully directed his 250-watter at CP5EP (189) 14, DU5 1AP (157) 13, 7SV (195) 14, ET2US (187) 2, KG6AFX (209) 13, KT1WX (187) 0, KW6BB (245) 15, KX6BU (225) 14, TF2WAF (158) 3-4, V5ICZ (126) 13, W7VMD, KG6 (199) 13, 4X4s FK (110) 4, SK (140) 3, 5As 1TJ (151) 3, 2TZ (170) 22 and 9S4A1 (117) 1. . . . HI3DL 18, KG1BO 7 and a 5A2 came back to W4TFB. . . . W4GUV busied himself with a DU7, KAs 2AK 2JW 3EB 5HM, KC6CG (241) 10-12, a KG1, KJ6FAA (200) 9-12, KR6QX 12 and others. . . . Saipan's KG6SB (255), VK9H10 (190) and VR2CW were assimilated by W9WHM. . . . WSKAK caught up with EA8BS (150) 22, KG1FR (210) 17, VP2s DA (120) 14-15 and KM (160) 14-15. . . . HBNU/Trieste, VSs 1GT 2CU, VU2EH, XZ2SS and 4S7SW show up on W7AHX's



\* Please mail all reports of DX activity to DX Editor Newkirk at 4128 North Tripp Ave., Chicago 41, Illinois.

list. .... Here and there, W5CAY nipped HH2W; W6NJU hooked VS2CV 23; and W7TML bagged KA2SK 11. .... The Northern and Southern California DX Clubs and West Gulf DX Club have the goods on the 14-Mc. 'phone workability, or imminent workability, of AC5PN, BV1US (250) 15, C3WV (190), CRs 4AL 5SP 7CO (190) 15, DU9VL (171) 10, ET2s AB (150) 4, US (187) 2, XX (144) 5, FO8s AB (118) 6, AK (159) 6, FP8AP (60) 17, FY7YE (152) 5, HC8GI (115) 5, HI6EC (177) 0, KG1AA (252) 4, KH6ABH (255) 5 on French Frigate Shoal, KJ6BG (230) 14, KP6AK (236) 6, KR6AF (129) 13-14, KX6AF (250) 6, LX1JW (191) 23-0, MP4BBV (128) 3, PX1YR (162), SV0WU of Rhodes, TF2WAN (130) 15, VK1s DC ZM (150) 6 of Macquarie, VK9s BG (168) 6-7, DB (175) 15, RM (110) 6, WI (293) 10, VQs 4AQ 4MA (190) 6, VRs 2AP (152) 6, 3C (165) 6, 6AC (142) 4-5, VS1s FS (111) 15, GX (142) 14, GZ (126) 13, VS2DF (107) 16-17, VS6s BE (106) 16, CL (130) 15, CT (172) 16 and no relation to VS4CT-VS5CT, CW (99) 7, VS9s AF AL, VU2ET (196), XZ2KN (179) 15, YJ1DL (118) 7, YK1AE, YO3s GL (157) 22, GM (190) 13, ZB2A (94) 19, ZCAIP (92), ZD4BT (150) 0, ZM6s AP (163) 8, AS (180) 6, AT (167) 5, 3V8AS (164) 5, 4X4s CK (150) 4, FF (150) 4, FQ (150) 4, FV (139) 3, 5A4TX and 9S4BE. .... *Newark News* Radio Club members combed 20-meter 'phone frequencies for CP5s EK EQ/CP6, CR6AF, CS3AC of Azores, CT2AC, DU1s CV VVS, EA8AX (150), EA9s AR AX BC BH, EL9A, FB8BZ, FF8AK (110), FM7s WF WQ, GC6GF, HAI1W, HH7RM/M, HK0AI, HRs 1BG 1KS 1OS 1RL 3HH, HZ1AB, JAs 1AC 1CU 1PW 1TW 3BD 4BB 6CA, JZ0AG, KC6s UZ ZB, KGs 4AP 4AX 6FAA, KM6AX, KR6s JW 00 (140), PT QW USA, KT1s DD WX, KV4s AA AQ BB BI, KW6s BD BJ, KX6BI, LB1DD, LX1DU, LZ1KSP, MP4s BBL BBU KAC QAI QAL, OD5s AB DA, OQ5s BI ER, PI1s J LB, PJ2s AA AG LC, ST2DB, SU1AS, SV8s WM WO WS, TF2WAG, TG9s BR MB, VKs 1PG 9HB 9OK 9RH, VP1s 1VR 2DL 3HAG 5BM 7NG 7NS 7NZ, VQs 2RR 4FK 4RF 5FU, VR2s AE AS, VSs 1EY 2DY 6DA, VU2s CS GM, YIs 2AN 3WW, YO3CM, YSs 1MS 10 2JV, ZC4BA, ZD3BFC, ZE6JI, ZSs 2MI of Marion Isle, 3AN, 3V8s BA BR, 4S7YL, 4X4s CR CX FZ GB, 5As 1TK 2TK and 4TU. In addition a little a.m. prowling by NNRC racked up Yanks-in-Japan KAs 2CW 2HM 2IM 2JW 2NY 2OJ 3RR 4BB 4AQ 7JS 8AB 8SB and 9MS boiling through with that intriguing Asiatic flutter.

20 c.w., to dredge up an old cliché, needs no introduction. San Rafael's W6GPB scored with LZ1KAB (70) 5, SP8KAF (63) 5, SU1REC (90) 21, SV0WS (20) 5, VQ5FS (50) 19, VU2s AL (25) 16, JK (40) 15-16, YI2AM (20) 20, ZD6BX (60) 5, 4S7s AM (30) 16, MH (10) 15-16, NB (55) 16-17, NX (50) 15-16, PT (55) 15-16, 4X4s CK (60) 5 and IE (48) 10. A QSL from VQ8AL, three years late, and an SWL report from Odessan UA4PL were highlights among Joe's postbox items. .... K2BZT battled through to DU7SV (90) 15, HA5AM (22) 21, HB1s in

VQ8AX (13) 22, a VU2 and ZD2, ZS3VC (75 (19, an 15 and 4X4. .... Twenty-eight watts got HA7OL (40) 22, KA300 (62) 12, OX3AY (12) 3, TF6WAK (24) 11, VP2BV/P (85) 22, VQ4RF (90) 20 and YO3GY for W9UKG. Then Doug kicked in the 300-watter and clobbered DJ1UE/YU (!), HA5BL (41) 22, a KJ6, SP5AR (68) 4, ZS91 (41) 21 and 9S4AX (7) 22. UAs 9CM 9DIH 0KAB, UB5s KAA KAB KBE and UG6AB were called in vain. .... W1WAI took on CP5EP (50) 22, JA5AA (70) 12, VP3VN (80) 12, UC2AA (50) 22, a ZD2, ZD3A (40) 22 and 9S4CH (33) 22, celebrating the arrival of his new DXCC diploma. .... IS1CXF (60) 22, KA2SK (32) 11, PJ2AR (85) 1, an SP5 and VP3, YN1PM (8) 23 and ZB1JRK (22) 23 came back to W1OJR. ZB1JRK pulls the big switch quite soon for departure from Malta. W1OJR forsakes DX on clear nights to scan the heavens with a homespun 3-inch reflector 'scope. .... CR8AC (10) 15 got away from K6ENX but FK8AK (10) 5-6, HR1RL (80) 16, KC6AJ (65) 7, TF2WAF (50) 7, VQ2DS (100) 16, VR3B (80) 4-5, VS1GK (70) 15, VS2CV (40) 16, VS6CQ (75) 17, ZP5GM (15) 17 and a 4S7 didn't. Since activating quite recently Otto has accounted for over 100 ARRL DXCC Countries List items in his Los Altos QTH. .... HA5KBZ (50) 23, HK0AI (62) 0, HP1EH (20) 14, a YS1 and ZD6 hit the spot with W8KAK. .... K6EC crept up on CX5CO (46) 0, I1BLF/Trieste (78) 0, SP9KAS (83) 5, VS1GU (91) 15, VS2DW (42) 16 and 4S7GE after late summer QRN drove him off favorite 40. .... K2GRV caught many of those already mentioned as well as EA9AP 23, FP8AP 19, HC1LE and I1BNU/Trieste. Whit is 15 and has 60 countries to show for five months DXing with his Viking, Windom and BC-348J. .... DU1CV (70) 15, UA9KKB (80) 15, VP4JL (20) 5, VS6DD (80) 13, ZM6AS (50) 3-4 and KR6USA (15) 15 worked W6UD. .... W7TML bore down on numerous Europeans, FK8AO 6, KA8SD 5, UA0 and UQ2, Aussie ship X1NP in the Pacific, YUs 1HU 3 and 3KT 6. .... ZD6BX picked up ET3AH (21) 13-14, I5LV 18-19, KJ6KW 15, KR6s LJ 14, MC 16, VK9AU 12, VR2BZ (52) 5-7, VS6s CD CG CO DE 15, ZC2PJ (20) 13-15, ZD2HAH 17 and many other choice catches. .... Quick! peeks at this log and that log, W2BRV: FB8AS, an FD4, MP4BBE. K2GFQ: FK8AE (15) 5, HB1OP/HE, OQ9CZ (45) 1-2, ZD2WAF 17. K2HZR: SV0WS (5) 19, K2JKC: KV4s AA BK, W3UXX: GD3IYS, HH9A, PJ2CT, VPs 5BM on Turks, 6PJ, W4GUV: a Liechtenstein HB1, IT1AGA, JAs 1CR 5AB 6AD, SP6WF 20, VQ6LQ (65) 2-4, ZB1ZM6 984, W4TFB: HH3DL, KA2s KS RB, ZD6, 3VAN (2) 5. W4YZC: CR6CS 19, FM7WP 22, HK0, YO2KAB 20, W5CAT: JA6HK, VP9BM, W5EUG: EA9DF, VKs ZLs, W5HIS: HB1PQ 0-1, JAs 1ACA 19, 1CL 13, KG1, KR6QW 7-8, YV5s 4E 12, BZ 3, W6NJIH: FM7WF 1, KC6, KX6NA (30) 4-5, OA4J, VS1 VS2, W7AHX: CR6, FB8BR, FZs, JZ0PS, F9QV/FC, ST2s AM AR, SU1IC (70) 3, VU2AT, 3V8AB (63) 5, W7VWS: KA2 KV4, IF9CLH: KG1, VP6GC, W8SQP: KG1JB, KV4 and Europe with but six watts input. .... WGDXC, SCDCX and NCDXC contribute these tidbits to our 20-c.w. gallimaufry: AC5s PN (8-100) 15, SQ (100) 18, CRs 4AF (26) 21, 9AI (85) 16, 10AN (70) 16, CTs 2BO (68), 3AB (49) 0, 3AN (70) 22, DU2s IOR (33) 12-13, 3DO (90) 12, EA8s BF (93) 1, BP (51) 2-3, FSMA/FB8 (74) 6, FB8BO (95) 12-13, FK8AL (12) 16-17, FO8s AC (94) 6, AG (50) 6-7, AK (95) 7, AM (10) 5, one FUBAZ (75) 22, FW8AB, FY7s YE (60) 1-2, YF (40) 12, HA7s KLA (48) 16, KLZ (35) 13, HE9LAA (64) 22-23, H1SHG (56) 4, HZ1AB (70) 0-1, IT1TAI (70) 22, JZ0AG (85) 13, KC6UZ (41) 13, KM6AX (80) 5, LB5WE (64) 13, LX1JW (43) 19, MP4KAV (9) 0, OD5DA (115) 23, SPs 5CC (110), 9KAB (40) 17, 9KAD (37) 13, one TFF1PJ (10) 4, VK9s RH (70) 7, RM (46) 13, WP (25) 7, VQs IQDN (73) 3-4, 2GW (45) 14-15, 4EO (83) 5, 4FM (64) 0, 5EK (100) 5, VR4AE, VS1s BJ (82) 16, FS (50) 14, GT (32) 15, VS2s DF (57) 13, EM (5) 15, RM (84) 14, VS6s AE (95) 13, AS (47) 14, AJ (100) 12-13, CL (6) 14, CT (88) 17, CW (76) 14, VS9AF, XZ2AD (18-90), YOs 2VM (72) 23, 3RF (58) 5, one ZA1KA (68) 20, ZC4GF (21) 13, ZDs 1PW (110) 13, 4BT (137) 4, 9AC (75), ZS2MI (175), 4S7s LW (58) 16, WP (30) 17 and 9S4BS (60) 23. UAs 3CR (79) 5, 4HI (81) 3, 6KTD (50) 14-15, 9DN (80) 23, 0GF (50) 13, 0GR (55) 13, 0KAB (50) 13, 0KAD (50) 14, 0KOA (46) 13-14, 0KUA (40) 13 and UH8KAA (60) 15 are included among the reserved Russians poking through. PX1EX (raised by K2BZT, Ws 1WAI 4GUV 6GPB 9EU 9UKG and others), XW8AB (52) 14 (reported by K2GMO, Ws 6GPB 7TML, K6ENX), YJ1DL (18) 6 and ZS8L (ZS1PD on DXCURSION) appear in many logs. So does AC0AA who is rumored to be (1) in Korea, (2) en route up Mt. Everest, (3) 'board ship here and there, *ad infinitum*. Now we give the dial a healthy twirl and find ourselves scanning



◆ "How's" normally goes light on portraiture but this gentleman is quite outstanding. He lays claim to possession of the first officially authorized station under new Egyptian amateur regulations — SU1IC. (Photo via W4HYW; W9FDX, MRAC: W9ABA; and W9EU)

Switzerland and Liechtenstein, 15REN (80) 21, LB8ZB (20) 22 just Norway, LX1AO (69) 16, LZ1KSP (77) 23, MP4QAL (90) 18, OY7ML (50) 23 who raised soup from 15 to 75 watts and intends extensive 3.5-Mc. work this season, SPs 3PS (55) 21, 5BR (20) 23, UQ2AN (29) 4, VQ8CB (72) 15, VR2s BP (60) 5, CZ (90) 5, YO3UA (30) 0, ZD2s IDCP (10) 21, NNW (20) 21, 4X4s BT (80), CK (76), DR (77), FK (60), FQ (18), FV (37), GY (80) and II (63), the Israelis worked between 21 and 22 GMT. .... DL4ZC QSOd CR4AL (72) 20-21, one FC7GE 22, OQ5BT 17, VP5DC (75) 0, YS10 23, YV1AI 21, ZD1FB (21) 19-20 and ZP5AY 21-2. .... EA6AM (18) 22, HB1MO in Schwyz canton, KG1AW (103) 23, KJ6s BG (15) 5, FAA (32) 1, KW6BB (30) 14, LB8YB (38) 0 of Greenland, OD5LX (10) 4, MP4JO (40) 3, VQ8AG (15) 4-5, VSs 1GS (49) 12-13, 1GX (42) 13, 6AS (46) 14, VU2s JG (43) and RC (40) 3 responded to W9EU. .... K2GMO did well with FD4BD (24) 22, JA6AA, KC6CG (61) 13, KG6NAB (100) 13, KJ6BG (70) 3, MP4BBL (66) 0, a Qatar MP4, OD5AP (20) 20, ST2NG (86) 22, a UQ2,

15 'phone. European, African and Oceanian openings now are the 21-Mc. fad and W4WMV snapped up VQ4s EO SS, VS1FK, ZB1AJX and 4X4BL with his 30-watter. Friend W4NQM raised a bunch of Europeans including ZB1s AY JRK, as well as CN8MT, ZLs and ZSs. VS2BB and LX SP SU stations were heard. .... Fifty watts and an 80-meter skywire were sufficient to accumulate CE3TH, CXs 2GM 2IY 5AF, CP5EQ/CP6, FM7WQ,



Before terminating his activities at OE13USA, K2IXD (left at table) visited on-the-air acquaintances in Israel. One of the many highlights of his 4X4 tour was a jolly hamfest at 4X4FV where these scenes were photographed. The chief of and host tunes the NC-98 while maintaining a schedule with K2IXD's Salzburg home base via the 4X4FV 40-watter. The station's location, shown at right, is situated in northern Galilee atop one of Israel's highest prominences. Beams and dipoles for all DX bands are plentiful and a new 100-watt rig is under construction.

HH7JL, HK2GO, HR3JH, KG4AV, KV4BJ, PJ2AA, TI2BX, ZP5IT and sundry PY-LU fellers for W4CHK. . . . W4YOK drew forth CE3SQ, CX6BM, HC1FK, HH7W/m, KH6EY/m, KV4BB and PK2AO, also hearing and working the /MM gang all over the place. . . . KA2GS, KH6s KZ5s, PY4YC, VKs 2AFE 3GV, ZLs 1GJ 2AX and ZP5HX returned W6ZZ's compliments. . . . W6UED trapped VP1SD while vacationing from 14 Mc. . . . NNRC reporters tagged 15-meter A3 activity by CN8s FM GO, CP5EK, EA9BS, FY7YE, HC1s EP FS, HP3FL, KG4AN, KL7ZG, MP4BBV, OA3s 3L 4AK, SV0WO, TI2s RC WM, VP5BM, VP6s FR GN GT WR, VP7NK, VO4s AQ EA EU RF, VR2CG, YV5BB, ZD4BO, ZP5JB, 4X4s BL GB and 9S4AD.

**15** c.w. still attracts the more adventurous Novice clientele. WN3ZKH captured F8VK, GW3QN, LU5 3EQ 3EX SEN 8TA, VP9BL and PJ2AR, reaching 21 countries on five continents. Anybody collected a Novice-style WAC yet? WNSBVF worked DL4ZC, HB9MQ, KN4CJO/KV4, KP4s in number, PJ2AV, VP6s 6KL 7NN and TI2EA with his Viking Adventurer. . . . Back to the Generals, K2DSW telegraphed with a big bunch including F8s DA RJ, LX1DZ, OE3SE, SP5AR, VP9BO and ZB1AY. CR6BX and KT1OC are gottaways. . . . W1CTW soaks up Europeans like a blotter now that he's licked his local power leak. Cal also stalks SU1CN, ZSs 7C and 8I via the A1 route. . . . FF8AJ 16-17, LU9DAZ 19-20 and another ZP6CR 19 came back to DL4ZC.

**40** c.w. conjured up LU7ZT 4, VP5DC 4, YU4DOP 4 and nifty ZD9AC 8 for W4TFB. . . . K2HZR mentions OY7ML, UA0KKB, UB51D and other 7-Mc. triumphs. . . . Among K2IKZ's lengthy list of European catches we note UO5KAA, SP7KAN, YU1KF 2BOP 3AJK and 4EPQ. Small wonder he likes his new QTH! . . . K2IGG mentions the availability of CR7CI, FQ8AA, JZ0DN, OX3AY, ZD6BX and ZE3JP on 40. VP8ZTQ and HZ1A were heard in the ? department. . . . W1VSW exchanged RSTs with F8s DA RJ, HB1OP/1IE, HR1JZ, SP5KAF, YU4JF, YV1AI, numerous PYs LUs and others — "More than enough to keep one on forty meters these days." . . . W2CUQ/3's 4.9 watts made the grade with many Europeans, KH6AYG, IT1TAI, VP5BM and ZP6CR. Will recommends a 5016GT final for a bit of sport on forty. . . . Hopscotching hamshacks hither and yon for 7-Mc. items, K2EPP: FA30A 23, FM7WP (20) 22, W4BXV: FAS, Europeans, HH3DL (6) 5, VP4BN 6, W4GCB: YU2IP, W4YOK: HK3KG, HRI, TI2CR, K4ADU: KV4BK (178), one HK5M, KL7s, VKs and ZLs, W5YBF: KT1TW, W7AHX: FG7XB, ZSs, W0VB5: TI2ES. . . . Moving upband, KN4CQA goes in for Novice-style DX in no small way. CM2PX, KN4AZY/VP9 (I), KV4BK, W6BGL and XE1KB wound up in Henry's bag. . . . Before becoming W7WSS, WN7WSS chatted with CE3DZ and JA8AQ on 40-meter W/N/K frequencies.

**160** c.w. continued to produce unusual midsummer DX at W1BB and other East Coast stations. As late as July 31st W1BB worked G3JVI 3-4. W3RGQ also was heard on the other side around this time. G3s GGN and

ERN are in there pitchin', too. W1BB opines that only the static level holds down hot-season 1.8-Mc. DX — the signals are there if activity exists at all. Whether winter or summer, keep an ear on one-sixty for one of those rare cool and quiet nights — you may be pleasantly surprised!

It takes the contest season to stir up much excitement on **ten** and **forty** 'phone at this stage of the solar cycle. NNRC's kilocycle inspectors hear HK4DT, JA1s AAX AD ADL AEO AFU AGU ALD ALL ANR AOD AOO AT ATW CE CU DY GE JO JS JV MR SW VP, JA2CF, JA3s EY IIF MD, JA6s AE SO, JA7s BV DB, JA9s BY, DO, KG6NAA and KW6BB creeping through on 7-Mc. voice. . . . CTISX, CX4CS, EA5 1CU 4DD, DLs 1HS 6RG, DM2APM, 1Is ACL BEM, SM5DRG, TI2s MS RL and VQ4AQ are reported among the audibles on 28-Mc. 'phone frequencies.

## Where:

G3KCE, one of MP4QAJ's former ops, unravels confusion ament the status of MP4QAJ and OD5AF. These two stations were operated jointly by G3KCE and the present legal licensee of OD5AF, both of whom are airlines-men. Now that Roger has left the scene, OD5AF continues to operate both stations. G3KCE lately flies a route which includes stops at Nairobi so you'll be working him as VQ4FX. QSL MP4QAJ and OD5AF to Box 150, Tripoli, Lebanon. . . . Openings to Asia still aren't on a pipeline basis but neither are they as ephemeral as they were a couple of years ago. K6DV finds that the MARTS (Malaya) bureau disgorged 900 QSLs to 63 countries during one recent month. . . . Ex-ET3S, now VE3RE, rolled up 155 countries in Ethiopia during the period July 15, 1954, to May 10, 1955, using a 4-stage 814 rig, 12-tube receiver, dipoles and a Lazy-H beam. Phil still awaits QSLs from some of the rarer items logged although one dandy did come through from ZC3AC. Drop a line to VE3RE if you have ET3S QSL problems. . . . W1WPO points out that the present VQ8AG attests to no responsibility or connection with VQ8AG operation prior to February of this year. Frank gets around on 20 c.w. quite handily with a c.c. 2-stage 20-watter, a modified bc. 5-tuber and a long-wire radiator. . . . HBNU/Trieste, perhaps the most active 11/T on DX bands, strongly emphasizes that incoming QSLs should be sent only via ARI or direct to F. Venezian 5, Trieste. . . . All-band Faeroes DX champ OY7ML asserts that Box 184, Torshavn, is the sole QTH that ensures delivery of his incoming pasteboards. . . . From MP4JO's agent, W2PCI: "There will be considerable delay in QSL cards from MP4JO. . . . Some of the fellows are sending follow-up cards and letters that are keeping me busy to answer — just got hit with 52 cards in the same mail!" . . . H1SWF, inactive since July 1st of last year, knows nought about the current usurper of his call. — W6CUQ. . . . FOSAC indicates he's now up to snuff in the confirmation department after shipping stacks of cards via bureau-bound slow boats. . . . From the mill of Washington, D. C., Postmaster Roy W. North in a letter to DL4ZC: "You are advised that Germany, Latvia, Lithuania and Estonia are the only countries with which we do not exchange international reply coupons." DL4ZC adds that IRCs also are

unusable at APOs . . . . . "We are getting complaints from W hams not receiving F8FW/FC QSLs although USKA sends these cards directly to the ARRL QSL Bureau for each call area. . . . Those not having received F8FW/FC QSLs in due course should apply for duplicates." USKA answers F8FW/FC QSLs when received—you fellows keeping envelopes on file with your call area QSL managers? . . . . . Time to reiterate, as we periodically do, that information and addresses appearing in this rubric are by no means necessarily official or guaranteed accurate. Frequently they are second-hand scuttlebutt items of doubtful origin. They are reproduced in the hope that they may lead someone to a fast QSL or two. Incidentally, when the QTH of any given station appears a second or third time, use the address most recently published. Early versions often are fragmentary to the point of unreliability. The following QSL catalog is testimony to the benevolence of W1s OJR UED WA1 ZDP, W2BRV, K2s BZT GJO, W4s GCB YOK YZC, K4ADU, WN5KNE, W6s AM NJU UED YY ZZ, W8KAK, W9s EU UKG, W0VFM, DL4ZC, HE9RDN-USKA, ZD6BX, V. Brenner, NCDXC, NNRC, SCDCX and WGDNC:

**ACSPN** (QSL via VU2JP) . . . . . **C3WV** (QSL to C3AR) . . . . . **CN8GG**, Navy 214, Box 50, FPO, New York, N. Y. . . . . **DL4PR** (QSL to W3AZZ) . . . . . **EA7FS**, Box 479, Sevilla, Spain . . . . . **ET3AII**, Box 499, Addis Ababa, Ethiopia . . . . . **FD4BD**, Lomé Airport, Lomé, French Togoland, F.W.A. . . . . **FY7YF**, G. Wong, % Pan-American Airways, Cayenne, French Guiana . . . . . **GB3GP** (QSL via RSGB) . . . . . **HB1KU/HE** (QSL via USAK) . . . . . **HB1OP/HE** (QSL via USAK) . . . . . **HH7W/m** (QSL to HH7W) . . . . . **HH0A** (QSL to W6XNS) . . . . . **HR1LW**, P. O. Box 93, Tegucigalpa, Honduras . . . . . **ISREX** (QSL to 15LV) . . . . . **KA2SK** (QSL via FEARL) . . . . . **KZ5VR**, Virginia Harvey, Box 15, Balboa Heights, C. Z. . . . . **MP4QAJ** (QSL to OD5AF—see text preceding) . . . . . **OE13HVN** (QSL to W6IIVN) . . . . . **OE13USA** (QSL via K2IXD and W6IIVN—see text preceding) . . . . . **OQ5BT**, Box 2432, Elizabethville, Belgian Congo . . . . . **ex-OX3AP**, P. Andersen, Kirsebaervej 13, Nykøbing Falster, Denmark . . . . . **OX3HN**, H. Nielsen (OZ2HN), Julianehaab, Greenland . . . . . **PX1EX** (QSL via REF or F8EX) . . . . . **PY2BKT**, N. Mauricio, Box 970, Santos, Brazil . . . . . **PY2QH**, Box 22, Sao Paulo, Brazil . . . . . **SU1CN** (QSL via RSGB) . . . . . **SUIREX** (QSL via W6NIF or W6NIF/4) . . . . . **TF2WAB**, Maj. C. Mack, USAF Hq. Iceland Defense Force, APO 81, New York, N. Y. . . . . **TF6WAK** (QSL to W1ZAC) . . . . . **VK9FN**, F. M. Nolan, Box 110, Port Moresby, P. T. . . . . **VK9WI**, Box 107, Port Moresby, P. T. . . . . **VK9WP**, W.A.P. Luke, Box 55, Rabaul, New Britain . . . . . **VP2VB/P** (QSL via KV4AA) . . . . . **VP3VN** (QSL via VP3YG) . . . . . **VP6KL**, F. Roberts, Diamondville, Worthing, Christ Church, Barbados, B.W.I. . . . . **VP6LT**, E. M. Glascock, Varel, Graeme Hall Terrace, Christ Church, Barbados, B.W.I. . . . . **VP6OA**, C. Agard, Belfield, Black Rock, St. Michael, Barbados, B.W.I. . . . . **VP7NZ** (QSL via VP7NM) . . . . . **VQ4FX** (QSL to G3KCE via RSGB) . . . . . **VR2AB/ZM6** (QSL to VR2AB) . . . . . **VR3C** (QSL via K4NC) . . . . . **VS1GQ**, A. B. Avery, 25A, Kampong Bahru Rd., Singapore . . . . . **VS1GT**, Tan Geok Gim, 168 Moulmein Rd., Singapore . . . . . **VS1GX**, Box 176, Singapore . . . . . **VS2EQ**, T.H.M. Gibson, 527A Tanjong Bungah, Penang, Malaya . . . . . **VS2ER**, Maj. J. C. Clinch, Colombo Camp, Ipoh, Malaya . . . . . **XE1KB** (QSL via LMRE) . . . . . **XE1BM** (QSL via XE1BM) . . . . . **XE1PAC** (QSL to K6ELL) . . . . . **XE1PAD** (QSL to K6ELL) . . . . . **XW8AB**, HRF, Box 6, Vientiane, Laos . . . . . **YN1JK** (QSL via YN1RA) . . . . . **ex-ZB2D**, G3HOP, 97 Stone Rd., Stafford, Staffs., England . . . . .

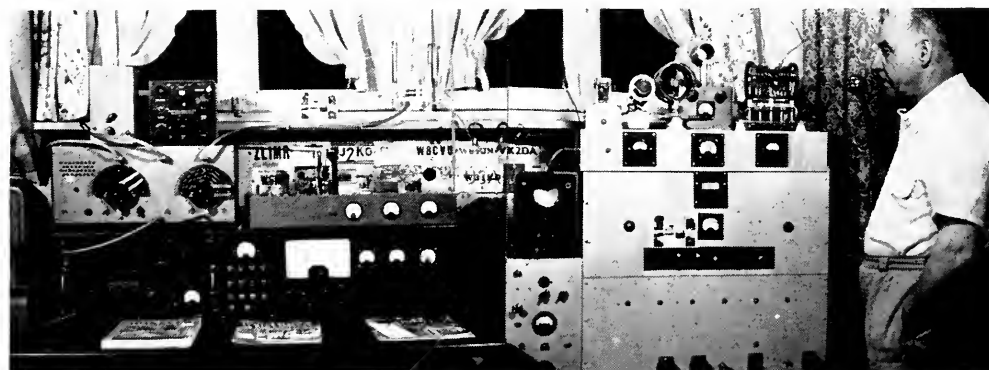
**ZP5IT**, I. Bailie, Yegros 429, Asuncion, Paraguay . . . . . **5A4TZ**, ARC, 25th Armoured Brigade, Sig. Sqdn., MELF1, Tripoli, Libya . . . . . **4S7AM**, Box 985, Colombo, Ceylon.

# Whence:

**Asla**—This month's W6YY one-man DX omnibus is ornamented with many an Oriental item: VS2DQ has ZC3 intentions upon returning from his U.K. holiday. He mentions one of the hazards of hamming on Christmas Isle—gregarious eight-foot land crabs. . . . VS6BE awaits delivery of a brand new KW-1 and 75A-4. . . . XZ2KN's protruding signal does credit to a newly installed 6-element beam. . . . C3WV fires up several evenings per week with a BC-610, 51J and half-wave vertical. Dick is slated for return to Uncle Sugar this month and hopes his relief will keep C3WV available. The other Formosan active, BV1US, is located some 150 miles to the south of C3WV's diggings. . . . VS2DW, who states he's the only native Malayan licensed, writes W9VP of DX-band trials and tribs. The Dancing-Witches BC-610 expired in smoke some time back, requiring him to fall back on a c.e. 6V6-6L6 combo which, surprisingly enough, performed quite comparably. Tan uses dipoles and a thoroughly revamped HRO-M inhaler. When not performing official duties as a legal interpreter in Ipoh (now quite a boomtown), VS2DW hits 20 meters and keeps the peace in a household which includes three sons and a daughter. His particular pet peeve is the DXer who far exceeds the bounds of civility in pursuing an inadvertently tardy "First VS2!" QSL. . . . W6AM reports that public demand forced XW8AB to scrounge up parts for a modulator after dispensing scores of Laos c.w. QSOs. . . . W6CRV, whose Saudi Arabia assignment was extended a month, has been assisted of late at HZ1AB by the keying and miking of K4DCC and W4EGG. Ron is the DXer of the group, though, and has pushed up HZ1AB's DX tally to a respectable 140/126. That's not at all bad in view of limited on-the-air tours and an accentuated traffic program. . . . K2IXD, one of OE13USA's mainstay ops for the past eight months or so, reports fabulous hospitality from 4X4s AB AE AH AM AS BO BX CK CW CX DF DK DR FB FK FQ FS FV GB GT II and associated SWLs during his recent two-week stay in the Holy Land area. One feature of Marty's visit was the ceremonious presentation of a well-earned 4X4-16 DX award, accepted by K2IXD on behalf of OE13USA. . . . A bow to JA1AA from W0VFM and the rest of us for scoring the first Japanese-national postwar DXCC.

**Africa**—ET3LF writes concerning a gala ham exhibit to be installed at the Haile Selassie I Silver Jubilee Anniversary Fair which opens in Addis on the second of next month. The Imperial Board of Telecommunications of Ethiopia intends to show off amateur radio to advantage. "We plan mainly operation on 20-meter c.w. and 'phone and, conditions permitting, we will be on 10 and 15 meters, too." The call isn't specified but if you encounter an expertly handled unfamiliar ET3 call early in November this should be explanatory. Souvenir QSLs doubtless will be forthcoming. . . . With an assist from buddy ZD6EF, ZD6BX blossomed out with a husky 805 final to replace his old trio of parallel 807s. ZD6EF frisks about on 'phone with a hundred-watt and ZD6RM sprinkles n.f.m. 'phone among his many 14-, 21- and 28-Mc. c.w. QSOs. (Yes, we said 28-Mc. c.w.!) "There may be another ZD6 active soon, solely on 'phone. . . . We now have 50 Mc. open for ZD6 fellows and gear for that band already is under construction." Whoops—we're slipping into W1HDQ's domain! . . . . ZS1SW, who runs 100 watts from 3.5 through 144 Mc., and 50 watts on 432 Mc., sports this variety of skybait: a 320-foot wire on 80; 66-footer on

**LX1AO**, currently active on 80, 40, 20, 10 and 2 meters, pioneered amateur radio in the Grand Duchy of Luxembourg as far back as 1925. Jean's specialty is 'phone DX. (Photo via LX1AI of RLADC)



40; separate 4-element rotaries on 20, 15 and 10; 6-element spinner on 6; 24-element job on 2; and a 40-element array on 432 Mc. — all aloft 80 feet or higher. This from a QSL to W7PHO which also depicts the elaborate ZS1SW console-type operating position . . . . . EL2X, ex-DL1EA-OE13EG-W80FQ, closed his Liberian logs after collecting 219 countries. All states were worked on 14 Mc., and

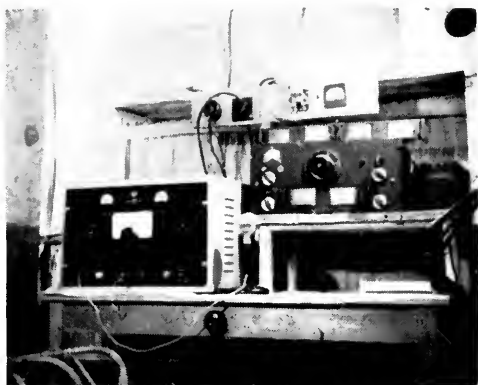


FK8AH performs entertainingly on 14-Mc. c.w. and 'phone. Those in need of New Caledonian DXCC credit will find it to their advantage to join the pile-up over which he presides. (Photo via W1WFO)

all but one on each of 3.5, 7 and 21 Mc. "I heard W1BB, W8GDQ and W9PNE on 160 and managed to work W2GGL and KP4KD crossband, they on 160, me on 80. Sorry that I'm not going to be there this fall as I had planned a Vee for Top Band. I sold out the complete station to my replacement — he will be on 20 for sure as he has my new 3-element Telrex. . . . Over 7000 EL2X QSOs from January, '54, through June, '55, with a couple of months off for vacation. Contests sure run them up!" . . . . . ZS5s AZ BF CY EG EZ JF JK KL LA OJ PB and PK manned impressive all-band installation ZS5DHE at the Durban Hobbies and Crafts Fair this summer. Did you dig that souvenir QSL?

**Oceania** — W1A (Australia) and NZART (New Zealand) invite world-wide participation in the 1955 VK/ZL DX Contest to be held ('phone) from 1000 GMT, October 1st, to 1000 on October 2nd, and (c.w.) from October 5th through 9th, same hours. The serial exchange is the usual five-digit (A3) or six-digit (A1) figure — RST001, RST002, etc. — except that an operator may commence operation with any number between 1 and 99. E.g., your first QSO can be numbered RST063, your second contact RST064, etc. Any amateur band can be used. *Scoring:* One point per contact, each station to be worked but once per band, this point total to be multiplied by the combined numbers of VK/ZL call areas worked on all bands (ZL1 through ZL4; VK1 through VK9, excluding VK8). *Logs:* For each contact record the date, GMT, band, call, and serials sent/received in that order. Use a separate sheet for each band and underline each new band-area as worked. Attach a summary sheet bearing total score, a brief station description and a signed declaration that rules have been observed. Entries must be postmarked on or before October 31, 1955, addressed to W1A Federal Contest Committee, Box 1234K, GPO, Adelaide, S. A., Australia. From these will be ascertained winners of certificates to be awarded high scorers in each ARRL DXCC Countries List country and U. S. A. call area. *Note:* There is no provision for multioperator work in this competition; operators manning the same station will submit separate entries as individual competitors. Good fishing! . . . . . One more peek at W6YY's dopesheet, this time from an Oceanian angle: VR2AB tried a few QSOs as VR2AB/ZM6 this summer, traveling via the Tokelau where he (sob!) found no opportunity to fire up. Friend VR2BZ still entertains strong slant-VR5 notions. . . . . YJ1DL, intermittently active on 20 and 40, states that the McCoy YJ1AA has not been active during the past year because of power deficiencies. . . . . No. 1 WAVKCA DX award (see p. 63, August QST) went to W6YY. . . . . All-band DX phenom DU7SV reached the DXCC-mark in the confirmation department. A hearty huzzah for Volt — DU7SV no doubt could have worked dozens more countries if he had hardheartedly ignored the DU-hungry W.K. pack always yapping on his heels. . . . . KC6CG (W2UDI) has another month or two to fatten his log before moving Jerseyward. — K2GMO . . . . . VP2VB/P (ex-G7DW) heads out of the Caribbean for the open Pacific aboard yacht *Tasme*, bearing a pair of self-powered ham stations courtesy the good offices of KV4AA. Danny hopes to anchor and operate gear ashore from various DX points while circumnavigating westward.

**Europe** — K2IXD (OE13USA) tells W1VG that OE13s will be no more. The advent of the Austrian Peace Treaty brought this about and the resident OE crew will take over on DX bands in good stride. OE13USA recently managed to accumulate the wherewithal for DXCC despite the heavy demands of frequent traffic skeds. . . . . GB3GP worked out of a Boy Scout camp in the U.K., according to W6KNE who gets in some SWling while stationed with the army in Germany. . . . . YU1GM hopes for a Pakistani or Ethiopian assignment since closing down in Belgrade. W6YY adds that Bob may head southward with the Byrd Antarctic Expedition come next fall. . . . . TF6WAK should be back home to take care of those Icelandic QSLs by now. . . . . New officers for the La Rochelle (France) Amateur Radio Club, which consists of Yanks in F7 clothing, are K2JCS (F7ER), president, and K9BGZ, secretary-treasurer. Competent service committees also have been designated. . . . . 9S4AX, who acquired an IIT-1S with DL4ZC's assistance, tells W9PRM he'll be greeting the W.K. gang with a new 829B final and 15-meter beam before long. . . . . As signified by the recent activities of HB1s KU and OP, Swiss hams once again may operate in Liechtenstein with that principality's prefix properly appended. . . . . IE9RDX mentions the possibility of HB9KB and associates putting a 3A2 call on the air during the first week of this month — QSLs to go via USKA. . . . . DL4PR, who is W3AZZ back home, has a Globe King, HQ-140X and 20-meter rotary about ready to go. Jim writes: "I attended a recent annual German-American Amateur Radio Club hamfest in Frankfurt which was attended by almost 200 hams and XYLs from surrounding Europe, a really fine affair." . . . . . Professional work temporarily has put the quietus on CT1CL's hamming but Gene hopes to be back in the swim before next summer. With 210 countries worked, QSLs from W7s GBY and WYM would complete CT1CL's WAS. . . . . EI3R, EI4AB and EI9Q were in the field operating "P" on DX bands during this year's successful IRTS (Fire) National Field Day. Considerable DX and many North American amateurs were worked during a hectic fun-filled 21-hour period. . . . . Three DXCC memberships from three different continents have been earned by Lt. Col. Lloyd D. Colvin, DL4ZC. His previous two DX triumphs were ticked off as W1KE and JA2KG. The colonel has operated under 18 different calls from all



Here's what the well-appointed Brunei hamshack will feature in the way of DX gear. VS5CT was a rare catch operated by G3DCT to the tune of 912 DX QSOs early this summer. Much of this equipment saw service as VS4CT in Sarawak and may now be in use under a British North Borneo call sign. (Photo via W5AL4, West Gulf DX Club)

over the globe and has had over 65,000 QSOs with amateurs in 242 countries. DL4ZC's wife and daughter also hold tickets. . . . . If you took your out-of-town vacation during the first two weeks of August, a favorite time for many, you missed a darned good shot at Andorra. PX1EX, representing a DX endeavor dreamed up by Fs 8FX 8EO 31B and 9UK, worked a flock of DX on several bands with an 807-final h.f. rig and a separate outfit for v.h.f. An IIRO with converters received and the antennae were a ground-plane for 20, Marconi for 40 and 80, and 3-element spinner for 2. Fine, guys — now how about IIV1EX and ZA1EX?

**South America** — W6ZLH of OA5G, back north on vacation, tried DX bands from California in late summer. George found being just another Six quite a bit different from his Peruvian DXperiences and he also missed the 800-foot-per-leg Vee he left down south. Regarding South American DXing, OA5G comments: "Fifteen has been

(Continued on page 142)

# Results, 21st ARRL DX Contest

*Entries Rise for Fourth Straight Year; 328 Earn Certificates*

BY PHIL SIMMONS, WIZDP

*"How high can scores go in an ARRL DX Contest? That question comes to mind each year when we analyze entries in these periodic contests of DX operating skill. And each year we say to ourselves in answer, 'This is it. We've reached the leveling-off point. It's impossible for scores to go any higher!' We've been wrong . . . which proves that impossible goals have just not appeared on the DX Contest horizon, at least not for the experienced DX operator who comes up annually with new score records or the neophyte who keeps improving . . . in an attempt to break into the top score brackets. It all adds up to the fact that these contests are great builders of operator-station performance. If DX is your meat, you'll continue taking part and become more skilled as time goes on; if you're new to DX operating, you just haven't been indoctrinated in the game until you've come through your baptism of fire in an ARRL DX Contest!"*

THOSE words, concocted by W1JMY in his 16th ARRL DX Contest round-up in September 1950 *QST*, are apropos today. Again the long-time enthusiasts returned, some to register postwar scoring records, and when the usual generous helping of fresh converts is taken into account, we emerge with 1242 entries (886 c.w., 356 'phone), up 11.5 per cent over 1954. There has now been a steady participation increase — 'though scarcely a meteoric one — in each of the past four Tests.

The *unexpected* makes every DX Test a continual game of fox and hounds, keeps the brethren hoping and hopping. An hour of fruitless calling elapses and you are as discouraged as a woodpecker in the Petrified Forest — suddenly three new countries reply in as many minutes and all thoughts of "pulling the big switch" are banished; now a block and tackle couldn't detach you from the operating position! This year TI9MHB, PJ2MA and HK0AI, in spots that even some DXCC Honor Rollers lack, injected spice. In February, 15 meters briefly cleared for Europe, allowing alert code proponents to hijack

several multipliers in a short span. A gorgeous array of African prefixes — including CR5, CR6, CR7, CT3, EA8, EA9, EA0, ET3, FB8, FF8, KT1, ST2, VQ2, VQ3, ZD3 — were catchable. KH6IJ and W6AM QSOd on 7 bands, and W4KFC did the same with HK4DP. W2SKE snapped up 16 countries on 10 'phone and was thrilled to raise Africans there for a change; Bill prophesies W/VE radiotelephone totals of *one million points* in sunspot peaks soon to arrive. The newly-introduced rule whereby Ws and VEs identified their states and provinces was happily endorsed by those in far-away places; many kept careful track of their states worked and several got all 48.

Let us pay tribute to such Test regulars overseas as CT1SQ, CT2BO, CT3AB, DL1BR, DL1DX, EA1AB, EA9AP, EI9J, F8VJ, G2PU (who has earned the last *nine* 'phone awards for England), G5RI, KH6IJ, KH6MG, KT1UX, KV4AA, KZ5BC, LA6U, LU3EX, LU9AX, OK1MB, ON4TQ, OZ1W, PA0UN, PA0VB, TF3MB, VK2EO, VK2GW, ZL1BY, ZL1MQ, ZS6DW — to mention a few. Each year they hurl themselves into the melee on one mode or the other, sometimes on both. When we raise them there is seldom a moment for even "HI JIM" or "PSD CUAGN OB," the hustle-bustle tempo being what it is. But they swap exchanges with thousands of us on numerous bands and we are grateful that they pop up perennially. Now that the furor has subsided, the League says, on behalf of the W/VE contingent, "MNI TNX OMs ES CU IN 1956." And sure-as-shooting we shall!

In line with long-established policy, competition for awards was confined to competitors in each ARRL mainland section and in each country outside the U. S. and Canada from which qualifying entries were received. Certificates of Performance will be issued in these categories:

	c.w.	'phone
Single-operator, W/VE	68	61
Multioperator, W/VE	3	1
Single-operator, non-W/VE	86	63
Multioperator, non-W/VE	1	0
Club	33	12

The 328 good-looking pieces of wallpaper are scheduled for mailing on October 15th, or

A Viking II, a 75A-2 and XYL-sponsored "coffee breaks" furnished EL2X any impetus needed to pace the Dark Continent on both 'phone and c.w. Ray has since bid farewell to Liberia, which now promises to become a real toughie.

**QST for**





thereabouts, and with each will go ARRL's congratulations for a job well done!

The 21st International DX Competition, however, was the only recently-scheduled ARRL contest which did not smash all previous records for participation (see Fig. 1). Despite vigorous advance promotion via IARU societies, foreign QSL bureaus, clubs and hundreds of prominent DXers, the success of the contest appears to depend principally upon the vagaries of sunspot numbers and the m.u.f. This, of course, is because it's a *DX* activity, not a domestic QSO Party, and as such it's particularly susceptible to the status of the ether. Under the rules U. S. and Canadian amateurs must work the 270-plus other items on the ARRL DXCC Countries List. It's the only contest in amateur radio which pits Ws and VEs "against" the world, and your letters tell us that you prefer it this way.

Even when the Kennelly-Heaviside layer just about dries up and blows away, more logs arrive from good old Europe than from any other continent save North America. Reflecting the reliability of the North Atlantic path, European high scores, like statistics dealing with valid entries, testify to the importance of ionospheric behavior. In 1949, for example, 13 European c.w. ops tallied over 100,000 points, and 26 did it in 1950. Their signals, with db. to burn, consistently blasted our eardrums on three or four bands during that banner era, an era when the Zurich sunspot count hovered well over 100. Alas, came 1951 and the average European score plummeted like a helicopter with a jammed rotor — GW3ZV, sporting a fabulous combination of gear and ability, was the sole 100,000-pointer. The next three dreary years drew blanks but results inched upward, and in 1955 DJ1BZ and DL1KB broke the tape at 138,462 and 102,258 points respectively. As Europe goes, it seems, so goes the DX Test!<sup>1</sup>

### The C.W. Section

When records are made, you can bet your r.f. gain control that W3BES will be involved. Mr. Mathis moseyed over to W2SAI (the boss himself was out of town) and, employing all bands but 11 meters, achieved 601 QSOs, a 246 multiplier and 443,538 points, a brand new U. S. A. single-operator high.

Others that reached the coveted 6-digit mark:

<sup>1</sup> There has been no change in the mathematics of scoring, but two special factors modify postwar European comparisons: (1) The twofold hiking of W/VE c.w. quotas has served to swell QSO figures of DLs, Gs and others in the densely populated countries. (2) 21 Mc., available the past three contests, has already upped South American and African results enormously; Europe-to-W/VE openings on this spectrum portion, however, have been infrequent and thus far have affected European totals to a negligible degree.

VP7NM dispensed 1939 A-1 exchanges on all bands 1.8 through 28 Mc. for 453,725 markers and third high non-W/VE. Charles, proprietor of the Bahamas QSL Bureau, has 142 confirmed on the DXCC roster. You can QRQ to 50 w.p.m. in his direction any old time — he's an ex-commercial op.

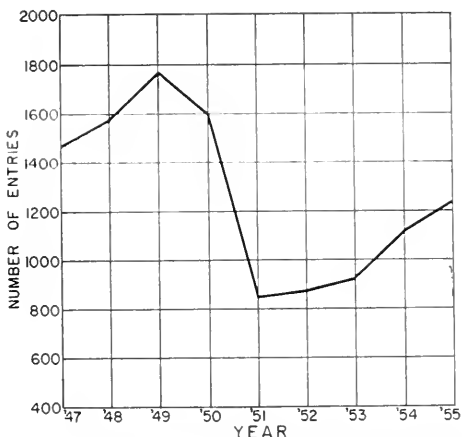


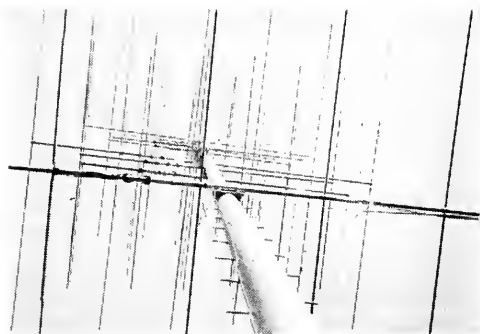
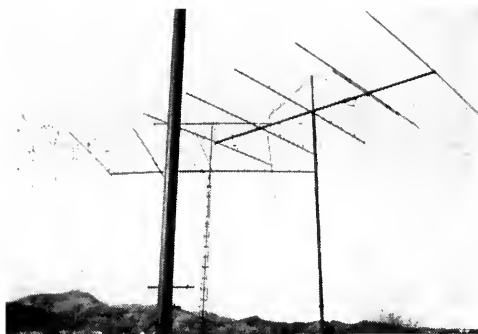
Fig. 1 — Total number of valid entries, c.w. and 'phone, in the 9 postwar ARRL International DX Competitions.

W4KFC 426,024, K2EDL 400,200, W3DGM 385,548, W4DHz 4 370,962, W4CEN 330,336, W3LOE 325,717, W3BYN 313,110, W2WZ 306,838, W3EIV 277,440, W6GAL 7 254,592, WSFGX 249,504, W3GHS 234,765, W3JTC 227,367, W3JTK 225,888, W5PQQ 220,473, W4YHD 188,543, W4OM 187,488, W9IOP 176,904, W1BFT 171,687, W4DQH 168,795, WSBKP 167,796, W6VUP 165,600, W3HEC 160,038, W8BTI 159,852, W9HUZ 159,360, W9LNM 153,180, W9FJB 150,234, W6RW 148,920, W1BIH 146,861, W1AXA 143,934, W1TYQ 140,448, W1JEL 139,722, VE4RO 137,160, W8DUS 136,782, W5CKY 130,077, W3KT 126,900, W6MBA 126,153, W3KDP 125,936, W6KEV 124,605, W4UXI 122,264, W1AZY 120,834, W4LZF 120,096, W6WB 119,340, W6FSJ 118,491, W3GHD 118,170, W2DOD 118,054, W4MZP 115,506, W3EKN and W3MFW 114,972, W1BOD 113,577, W3ADZ 110,565, W9VUL 110,403, W5DWT 110,336, W2AIW 110,166, W4CC 105,705, W1ODW 104,775, W9DAE 104,538, K6CIT 104,544, W1TX 101,748, W11DL 100,564.

Another precedent-wrecker was the 514,080 points of W3CTJ, jointly manned by W3s CTJ and NOH. Maury and Al racked up a four-day







Herewith a couple of elaborate antenna layouts that paid off handsomely in the scoring columns. *Left:* W6YMD's beams and verticals form picturesque angles as they jut skyward at Pacific Palisades; that's the base of the 3.5-Mc. ground plane in the foreground. A quintet of Southern California DX Club brasspounders utilized the whole shebang to good avail, got a thumping 363,480 points. . . . *Right:* Have a look at the maze of 48 elements comprising stacked Yagis for 14, 21 and 28 Mc. at W2SKE/2. The 108-foot mast is self-supporting and rotatable. This awesome structure helped Bill nab second position among U.S.A. 'phones.

DXCC with 101 countries worked, a multiplier of 255 and 672 QSOs.

These efficient crews also finished up admirably in the more-than-one operator goings-on: W6YMD 363,480, W4KVX 358,974, W6ITA 314,820, W6TT 284,271, W3ALB 256,896, W6LDJ 244,620, W9AVJ 207,765, W3ECR 189,879, W6AM 185,370, W3GHI 164,088, W6GTI 134,670, W6LDD 112,266.

In the overseas division, contester par excellence KH6MG remained in top form, beat out the rest of the non-W VFs with his 2203 QSOs, 74 multiplier, 489,066 points.

The continental yardstick is probably the fairest for study of foreign scores. Sorted in that fashion, the leaders shape up thusly: *Africa* — EL2X 182,373, EA9DF 127,661, OQ5GU 113,490, CR6AI 104,400, FA9RW 97,290; *Asia* — JA1CJ 50,715, KR6LJ 40,560, JA3AF 38,529, JA3AB 25,766, KA2OJ 21,947; *Europe* — DJ1BZ 138,462, DL1KB 102,258, OE13USA 98,805, DL4ZC 91,875, G5RI 89,712; *North America* — VP7NM 453,725, NE2OK 308,636, KG4AJ 302,849, KV4AA 296,140, KP4CC 247,040; *Oceania* — KH6MG 489,066, KH6J 461,700, ZL1BY 306,408, KH6PM 237,006, KH6AYG 211,526; *South America* — HK4DP 232,712, LU3EX 185,304, LU8AF 156,771, PY7AN 109,620, CE3AG 98,340.

### The 'Phone Section

In the frenzied battle of the microphones, veteran DXer W1ATE set a staggering all-time high of 492,184 points. Chad, with his lavish

antenna collection, scored everywhere from 160 through 10 but had his best luck on 20, where 435 of 690 QSOs were consummated. He also snared 105 different countries for a multiplier of 238, was active 94 hours out of the possible 96.

Other extraordinarily successful huffers and puffers: W2SKE/2 439,356, W4KWY 282,540, W6YY 233,444, W3DHM 230,640, W4OM 214,884, W2WZ 173,160, W3GHS 158,410, W7ESK 151,200, W9EWC 139,500, W4DQH 119,915, W8NXF 101,178, W4EEE 100,602, W6VSS 99,231, W8RLT 89,916, W8LKH 88,832, W3JNN 86,697, W8DUS 67,041, W3CUB 64,842, W5KBP 62,496, W7DL 59,584, W6IDY 59,040, W4CBQ 55,872.

These partook of the verbal fisticuffs on a "Winter Field Day" basis and fared well as multioperator set-ups: W2SAI 314,880, W9AVJ 141,614, W8BKP 133,569, W6AM 124,413, W8NGO 91,432, W3GHI 75,864, W8NWO 74,466, W6WZD 66,846, VE3RCS 56,158.

Hawaiian KH6IJ shoved aside his electronic key, unshorted the modulation transformer and QSY'd to the 'phone segments. And before he plopped into his four-poster on March 13th, Katashi had logged 918 contacts, a 59 multiplier, and 162,486 points, the huskiest tally from overseas.

Continental pace-setters: *Africa* — EL2X 81,405, ZS6DW 41,140, EA9AR 13,524, ZE2KR 9675, CT3AE 6831; *Asia* — KA2OJ 3531, JA1VP 450, JA4BB 450, OD5AB 336, HZ1AB 234; *Europe* — CT1SQ 46,440, EA4DL 27,552, OE13USA 16,548, EA4DR 13,248, ZB2A 12,213; *North America* — VP7NX 148,665, VP6WR 127,098, HP3FL 73,017, VP9L 66,317, KG4AJ 55,044; *Oceania* — KH6IJ 162,486, KH6PM 90,576, KH6ANH 59,040, KH6MG 35,100,



Multiplier-hungry DXers welcomed with open arms an EA6AF 25-hour 3-band junket, during which Bartolome's 50-watter culled 34,488 points and A-1 honors for the Balearics.

**QST for**

# CLUB SCORES

Club	Score	C.W. Winner	'Phone Winner
Frankford Radio Club.....	3,753,930	W2SAI	W3DHM
Southern California DX Club.....	3,489,751	W6GAL/7	W6YY
Potomac Valley Radio Club.....	2,314,488	W4KFC	W4CBQ
Northern California DX Club.....	1,845,895	W6KEV	W6IDY
Ohio Valley Amateur Radio Assn.....	1,048,925	W8FGX	W8BTI
Maul Amateur Radio Club (Hawaii).....	972,444	KH6MG	KH6PM
Northwest Amateur Radio Club (Ill.).....	453,461	W9NHI	
Lancaster Radio Transmitting Society (Pa.).....	429,051		
Rochester DX Assn.....	367,117	W2DOD	W2VQM
Connecticut Wireless Assn.....	261,025	W1BIH	
North Suburban Radio Club (Ill.).....	258,438	W9FJB	
El-Ray Amateur Radio Club (Mass.).....	237,948	W1BOD	
North Carolina State College Amateur Radio Club.....	237,890	W4UCI	
Four Lakes Amateur Radio Club (Wis.).....	204,777	W9LNM	
Anchorage Amateur Radio Club (Alaska).....	153,613	KL7AWB	KL7BCH
Order of Boiled Owls (N. Y.).....	125,046	W2HSZ	
Milwaukee Radio Amateurs' Club.....	90,877	W9GIL	W9FDX
Central Connecticut Contest Club.....	90,192		
Richland Amateur Radio Club (Wash.).....	80,208	W7GWD	W7GWD
San Diego DX Club.....	79,848	W3MSK '6	
Helix Amateur Radio Club (Calif.).....	59,691	W6LRU	
Antietam Radio Assn. (Md.).....	57,781	W3EPV	
Westpark Radiops (Ohio).....	54,107	W8AJW	W8AJW
Egyptian Radio Club (Ill.).....	51,451	W0ANF	
Schenectady Amateur Radio Assn.....	49,787	W2FBS	
South Jersey Radio Assn.....	45,970	W2SDB	
Tri-County Radio Assn. (N. J.).....	36,936	W2JME	
Chicago Suburban Radio Assn.....	29,413	W9WFS	
Delano Amateur Radio Club (Calif.).....	28,125	W6EFV	
Lake Success Radio Club (N. Y.).....	24,187	W2SGK	
Dade Radio Club (Fla.).....	15,465		
Coronado Radio Club (Calif.).....	15,015	K6EBH	
Morris Radio Club (N. J.).....	14,120	K2CBB	
Central High Radio Club (Iowa).....	10,749	W0DSP	
Tri-State Amateur Radio Society (Ind.).....	7,755	W9FGX	
Silvergate Amateur Radio Club (Calif.).....	3,909	K6BEC	K6BEC

ZL1BY 32,289; *South America* — PJ2AF 101,475, LU1EQ 63,300, VP4BN 28,700, LU7BQ 17,496, VP3HAG 15,930.

## The Clubs

The cocobolo gavel with the engraved silver band, issued annually to the club whose members accumulate the largest aggregate score, is dearly sought after indeed. Some groups, we're told, employ any method short of the cat-o'-nine-tails to effect a full turnout. Winner in 1955 was once again Philadelphia's Frankford Radio Club, whose 41 entries added up to a brilliant 3,753,930 points. In a valiant bid to repeat their 1950 gavel-winning drive, Southern California DX Club members forged into second position only 265,000 points shy of FRC's total. The accompanying tabulation shows the standings of the 36 competing groups and the calls of their 45 certificate awardees.

## Disqualifications

The following are deemed ineligible for score listings or awards. In each case disqualification

VP6WR knuckled up to 127,098 points, ranked number three among the 120 foreign radiotelephones. Woody used a pair of 807s, modulated by more of the same, to twirlers of the plumber's delight variety, a long wire and a Windom. Best band: 21 Mc., where he snagged 234 of his 625 contacts.

is for off-frequency operation as confirmed by a single FCC citation or two accredited Official Observer measurements: C.W. — W2ESO, K2GAL, W0GXI/0, W0RLI, KC6CG; 'Phone — W3ALB, W3VKD, W3YRK, W3ZQ, W4AIA, W4NHF, W4RRK, W4SOV, W5FBW, W6BYB, W7JLU, W9AMM, W0LBB, W0VIP.

— . . . —

Propagation specialists agree that we are presently poised on the threshold of a DX millennium. Thousands of new amateurs are expected to succumb to the lure of DX as, starting very soon, they enjoy their first taste of ideal conditions. How are *you* fixed for the bonanza? The time is ripe to reduce s.w.r.s, scrape the rust from the 10-meter rotator, lick any 21-Mc. TVI and align the inhaler, if needs be. Don't be caught flat-footed. Take the action required to get your station functioning at peak efficiency *now*, because the 22nd ARRL International DX

October 1955



Competition will be upcoming almost before you know it! Watch future *QSTs* for details.

## C. W. SCORES

### Twenty-First International DX Competition

Operator of the station first-listed in each section and country is winner for that area. . . . The multiplier used by each station in determining score is given with the score — in the case of U. S.-Canada this is the total of the countries worked on each frequency-band used; in the case of non-W/VE/VO entries it is the total of the U. S.-Canada districts worked on each band. . . . The total number of contacts is listed next. . . . The letters A, B, and C approximate the input to the final stage at each station; A indicates power up to and including 100 watts; B indicates over 100 watts, up to and including 500 watts; C indicates over 500 watts. . . . The total operating time to the nearest hour is given for each station and is the last figure following the score. . . . Example of listings: W3DGM 385,548-228-565-C-83, or final score 385,548; multiplier 228; 565 contacts; power over 500 watts; total operating time 83 hours. . . . Stations manned by more than one operator are grouped in order of score following single-operator listings in each section or country tabulation; calls of participants at multi-operator stations are listed in parentheses. . . . Where three or more multiple-operator entries appear, the top-scoring station is being awarded a certificate.

#### ATLANTIC DIVISION

##### Eastern Pennsylvania

W3DGM. . . 385,548-228-565-C-83  
W3GHS. . . 234,765-185-423-C-64  
W3KTT. . . 126,900-141-300-C-60  
W3GHD. . . 118,170-130-303-B- -  
W3MFW. . . 114,972-143-268-C-40  
W3ADZ. . . 110,565-135-273-C-55  
W3CGS. . . 88,830-126-235-C-48  
W3DLR. . . 64,152-99-216-C-46  
W3LEZ. . . 61,692-106-194-B-50  
W3ALX. . . 38,505-85-151-B-12  
W3EAQ. . . 38,181-89-143-C-45  
W3EVV. . . 35,340-76-155-C-15  
W3HER. . . 33,300-74-150-B-25  
W3IMV. . . 26,130-65-134-B-23  
W3QLW. . . 17,874-54-111-B-27  
W3MDE. . . 14,100-47-100-A-20  
W3EAN. . . 9546-43-74-C-11  
W3OCU. . . 9240-44-70-C-10  
W3TYY. . . 9020-41-74-A- -  
W3RRI. . . 8904-42-71-C-38  
W3TJW. . . 7920-40-66-B-20  
W3GRS. . . 7371-39-63-A-9  
W3MFT. . . 3000-25-40-B- -  
W3ANZ. . . 2337-19-41-B-20  
W3SOH. . . 1920-20-32-B-9

W3HTE. . . 1512- 18- 28-B-10  
W3MDO. . . 1500- 20- 25-B- -  
W3LAP. . . 693- 11- 21-B-12  
W3CTJ (W3s CTJ NOH)  
W3ALB (W3s ALB JNQ) 256,896-192-446-C-75  
W3ECR (W3ECR W4JFM) 189,879-167-379-C-74  
W3GHH (W3s GHM KDF) 164,088-159-344-C- -  
W3KFQ (W3s KFQ QMZ) 53,628- 82-218-C-76

##### Md.-Del.-D. C.

W3LOE. . . 325,717-217-501- C-70  
W3BVN. . . 313,110-213-490- C-80  
W3EIV. . . 277,440-204-454- C-88  
W3JTC. . . 227,367-189-401- C-83  
W3JTK. . . 225,888-181-418- C-80  
W3HEC. . . 160,038-153-350- C-71  
W3KDP. . . 125,938-136-310- C-48  
W3EKN. . . 114,972-132-297-BC-50  
W3A00. . . 87,240-120-243- B-39  
W3DRD. . . 80,325-119-225- B-54  
W3ZQ. . . 63,036-103-204- C-70  
W3AYS. . . 55,836- 99-190- C-34  
W3EPV. . . 53,592- 88-203- C-53

## LICENSING AREA HIGHS

### C.W.

### 'PHONE

W1BFT. . . . .	171,687	W1ATE. . . . .	492,184
W2SAL. . . . .	443,538	W2SKE/2. . . . .	439,356
W3CTJ. . . . .	514,080	W3DHM. . . . .	230,640
W4KFC. . . . .	428,024	W4KWY. . . . .	282,540
W5CKY. . . . .	130,077	W5KBP. . . . .	62,496
W6YMD. . . . .	363,450	W6YY. . . . .	233,444
W6GAL/7. . . . .	254,502	W7ESK. . . . .	151,200
W8FGX. . . . .	249,504	W8BKP. . . . .	133,569
W9AVJ. . . . .	207,765	W9AVJ. . . . .	141,614
W0DAE. . . . .	104,538	W0EIB. . . . .	23,079
VE1NN. . . . .	76,146	VE1CU. . . . .	429
VE2BP. . . . .	10,296	VE2APC. . . . .	23,562
VE3IR. . . . .	11,613	VE3RCS. . . . .	56,158
VE4RO. . . . .	137,160	VE4RO. . . . .	49,128
VE5PM. . . . .	5859	VE5GF. . . . .	2142
VE6VK. . . . .	18,513	VE6NX. . . . .	4316
VE7KC. . . . .	7805	VE7ZM. . . . .	462
VO6N. . . . .	10,908	VO6N. . . . .	4455

W3DVO. . . 45,936- 87-176- B-65  
W3CPB. . . 38,097- 83-153- B-30  
W3AEL. . . 37,674- 78-161- B-25  
W3WV. . . 25,740- 65-132- B-19  
W3VRJ. . . 17,472- 52-112- C- -  
W3EPR. . . 16,380- 63- 88- B-29  
W3CDZ. . . 16,170- 55- 98- -32  
W3WVG. . . 14,448- 56- 86- -15  
W3ZAL. . . 11,400- 50- 84- C-27  
W3HVM. . . 10,560- 48- 74- A-20  
W3EIS. . . 5760- 40- 48- B-10  
W3WU. . . 5202- 34- 51- B- -  
W3HVD. . . 4818- 33- 50- C-15  
W3COK. . . 4512- 32- 47- C- -  
W3YRK. . . 4060- 29- 48- -30  
W3IYE. . . 2940- 28- 35- A-10  
W3GUA. . . 2697- 31- 29- C- -  
W3BVO. . . 75- 5- 5- B- 5  
W3NZT. . . 36- 3- 4- A- 4  
W3MFJ (W3s IKM MCG MFJ) 77,112-102-252- B-75  
W3YTS (W3s RYX YC MFJ) 2340- 20- 45- B-20

### Western Pennsylvania

W3VKD. . . 56,430- 95-198-C-16  
W3NCF. . . 21,840- 69-120-B-56  
W3APQ. . . 15,990- 65- 82-A-42  
W3ELZ. . . 10,080- 40- 84-B-21  
W3ZAO. . . 3528- 28- 42-B-27  
W3SJI. . . 1125- 15- 25-B-25  
W3KNQ. . . 960- 16- 20-A-30

#### CENTRAL DIVISION

##### Illinois

W9HUZ. . . 159,360-160-332- B-82  
W9FJB. . . 150,234-147-342- C-72  
W9GRV. . . 93,375-125-249- C-70  
W9NII. . . 92,628-124-249- B-72  
W9ABA. . . 78,648-113-232- C-60  
W9ERU. . . 78,144-11-236- C-65  
W9UNG. . . 43,172- 86-168- C-40  
W9EU. . . 34,344- 72-159- C-21  
W9TGB. . . 33,069- 73-151- B-43  
W9TJV. . . 28,860- 74-130- B-22  
W9FID. . . 26,274- 58-151- C-50  
W9QJY. . . 17,010- 54-105- B-46  
W9WJV. . . 11,454- 46- 83- B-28  
W9FNR. . . 9751- 49- 67- B-27  
W9WFS. . . 7200- 40- 60- B-19  
W9VL. . . 4524- 29- 52- B-19  
W9WIO. . . 3750- 25- 50-BC-10  
W9SGB. . . 3726- 27- 46- B-35  
W9WLB. . . 3375- 25- 45- A-15  
W9KDY. . . 3150- 25- 42- B-12  
W9PCF. . . 1071- 17- 21- B-7  
W9DQV. . . 960- 16- 20- A-10  
W9NJZ. . . 978- 9- 14- B-7  
W9LQE. . . 48- 4- 4- B- -  
W9EXL. . . 18- 2- 3- A- 5  
W9AVJ (W9s GVZ NZM PKW) 207,765-171-405- C-96  
W9DDF (W9s DCF DDF DWD OCB) 22,144- 64-116- B-29

### Southern New Jersey

W2SAI. . . 443,538-246-601- C-80  
K2EDL. . . 400,200-232-575- C-90  
W2GGL. . . 93,534-131-238-BC-55  
W2SDB. . . 28,770- 70-139- C-50  
W2PAU. . . 12,100- 55- 74- B-17  
K2CH. . . 10,550- 50- 71- B-21  
W2QKJ. . . 9348- 38- 62- B-50  
K2CPR. . . 6405- 35- 61- A-35  
W2DAJ. . . 4992- 32- 52- 4  
W2QND. . . 1950- 25- 26- B- 4  
W2VUM. . . 1890- 18- 35- B-17  
K2CSC. . . 969- 17- 19- B-14  
W2CAG. . . 108- 6- 6- B-4  
W2EBW. . . 48- 4- 4- C- 4

### Western New York

W2DOD. . . 118,054-134-295-B-5  
W2UWD. . . 78,000-104-250-C- -  
W2SAW. . . 75,597-113-223-B-50  
W2DSB. . . 41,886- 78-179-B-32  
W2BJH. . . 40,320- 84-160-C-51  
K2CD. . . 28,644- 62-154-C-39  
W2FBA. . . 27,846- 78-119-B-20  
W2ABM. . . 27,720- 60-154-C-40  
W2ICE. . . 25,200- 75-112-C-18  
K2KID. . . 21,105- 67-105-B-68  
W2QJM. . . 20,355- 59-115-B-41  
W2TXB. . . 14,847- 49-101-C-18  
W2MA. . . 10,716- 47- 76-C-25  
W2EMW. . . 8610- 41- 70-B-15  
W2QZI. . . 3807- 27- 47-C-14  
W2ROM. . . 3360- 28- 40-C-19  
W2DKS. . . 2886- 26- 37-B-18  
W2BY. . . 2760- 23- 40-B- -  
W2VXA. . . 2616- 24- 37-B-32  
W2KEL. . . 1980- 22- 30-B-18  
W2REF. . . 1710- 19- 30-B- 5  
W2ZCZ. . . 1638- 21- 26-B-10  
K2BKU. . . 1035- 15- 23-B-14  
W2WPI. . . 840- 14- 20-C-9  
W2UTH. . . 210- 7- 10-B- 2  
W2CIH. . . 189- 7- 9-A- 6

### Indiana

W9IOP. . . 176,904-168-351-C- -  
W9VUL. . . 110,403-141-261-C-30  
W9UKG. . . 38,988- 76-171-B-87  
W9ZTD. . . 8170- 43- 64-B-25  
W9PQA. . . 4743- 31- 51- -40  
W9CWO. . . 4428- 36- 41-A- -  
W9FGX. . . 4239- 27- 53-A-10  
W9EHU. . . 3465- 33- 35-B-59  
W9DHM. . . 1767- 19- 31-B-14  
W9UC. . . 540- 12- 15-B- 4  
W9FYM. . . 147- 7- 7-A- 5  
W9DGA. . . 48- 3- 4-A- 1

### Wisconsin

W9LNM. . . 153,180-148-345- C-75  
W9RQM. . . 81,360-113-240-BC-48  
W9GIL. . . 43,344- 44-172- B- -  
W9FDX. . . 21,594- 59-122- C- -  
W9RBI. . . 21,060- 65-108- C-25  
W9KKX. . . 18,648- 56-111-BC-25  
W9WJH. . . 15,087- 47-107- A-25  
W9RKP. . . 13,413- 51- 89- B-30  
W9SZR. . . 10,665- 45- 79- B-30  
W9GWK. . . 10,332- 42- 82- B-20



By checking in with 330,336 points, W4CEN extended his streak to five North Carolina c.w. triumphs. The 75A-3 above is flanked by the exciter unit on the left and the final amp, parallel 4-250As, on the right. Tom, a star performer in the shindig since the Thirties, labels it "THE Contest," is presently toiling with a 2-element 7-Mc. beam to boost his percentages in the 1956 dogs.

This neat arrangement features (from left) a p.p. 810s rig, voltage regulator, VFO, 'scope and HQ-129X. It's the property of CT15Q, top voice man for Europe with 46,440 points and 389 contacts, 47 of which came about on the allegedly uninhabitable 40-meter 'phone band. Nice going, Humberto!



W9VOD.....	5338-34-53-B-9	W8STL.....	31,484-68-155-C-40
W9WEN.....	3969-27-49-B-13	W8BOJ.....	30,492-77-132-C-18
W9HMU.....	1188-18-22-A-9	W8VTF.....	26,880-64-110-B-
W9QNO.....	1080-15-24-B-30	W8JJW.....	21,488-68-106-C-30
W9BTM.....	630-14-15-A-20	W8OPG.....	16,348-61-90-B-21
W9SDK.....	540-12-15-B-5	W8AJW.....	14,840-53-94-A-
W9WWJ.....	150-5-12-A-4	W8JIN.....	14,151-53-89-C-12
W9UDK.....	75-5-5-B-3	W8SMC.....	12,450-50-83-B-17
W9MDG.....	12-2-2--	W8GJG.....	10,449-43-81-B-26

## DAKOTA DIVISION

### North Dakota

W0EOZ.....1131-13-29-B-4

### South Dakota

W0BLZ.....25,740-66-130-B-28

### Minnesota

W0TKX.....34,188-77-148-B-35  
W0YCR.....27,840-64-145-C-  
W0JNS.....17,856-62-96-B-42  
W0QBA.....11,481-43-89-A-18  
W0VIP.....6039-33-61-B-  
W0EDX.....5810-35-56-C-20  
W0PHZ.....5208-31-56-B-21  
W0DRG.....2898-23-42-B-20  
W0OTI.....2394-19-42-A-37

## DELTA DIVISION

### Arkansas

W5MSH.....5880-33-56-A-25  
W5QKZ.....2100-20-35-B-14

### Louisiana

W5KC.....49,383-93-177-B-35  
W5MNT.....42,828-83-172-A-62  
W5CEW.....30,104-71-142-C-  
W5KTD.....3180-20-52-B-9  
W5BL.....726-11-22-B-9

### Mississippi

W5CKY.....130,077-149-291-B-61  
W9APY/5.....60,348-107-188-B-50

### Tennessee

W4DQH.....168,795-155-365-C-66  
W4FKA.....33,288-73-152-B-72  
W4ZZ.....429-11-13-B-19  
W4ZWZ.....270-8-10-B-15

## GREAT LAKES DIVISION

### Kentucky

W4KTC.....46,248-94-164-C-45  
W4JBQ.....16,905-49-115-B-37  
W4OMW.....3813-31-41-B-  
W4KVX (W4s EPA KVX OMW,  
W8UOD) 358,974-231-518-C-88

### Michigan

W8DUS.....136,782-153-298-C-70  
W8CVU.....98,208-124-264-B-40  
W8UAS.....76,272-112-227-C-60  
W8YIN.....50,490-90-187-A-42  
W8HML.....48,636-84-193-C-21  
W8RQ.....27,648-72-128-B-34  
W8KWC.....4692-34-46-B-5  
W8KPL.....1530-17-30-B-7  
W8MCC.....630-14-15-A-9  
W8MFI.....432-12-12-B-  
W8DLZ.....429-11-13-B-5  
W8SS.....12-2-2-B-1

### Ohio

W8FGX.....249,501-184-452-C-60  
W8BKP.....167,796-158-354-BC-57  
W8BTI.....159,852-154-346-C-48  
W8PUD.....67,221-97-231-BC-55  
W8EV.....44,118-86-171-C-25  
W8AAP.....37,680-80-157-C-38

## HUDSON DIVISION

### Eastern New York

W2H0.....69,690-101-230-B-71  
W2HSZ.....55,290-95-194-B-50  
W2EWD.....47,478-82-193-B-58  
W2FRS.....46,512-76-204-BC-42  
W2AWF.....22,422-74-101-BC-40  
W2JMF.....10,944-43-76-B-30  
K2EDH.....10,412-46-76-B-  
K2BE.....9,150-30-35-B-42  
K2EUI.....2622-23-38-A-11  
K2HVN.....2550-25-34-B-43  
W2GRJ.....2760-20-38-C-10  
W2IP.....2746-12-16-B-  
W8RGF/2.....429-11-13-A-  
W2APH.....147-7-7-B-  
W2BYN.....12-2-2-B-1

### N.Y.C.-L.I.

W2WZ.....306,838-202-507-B-70  
W2BRV.....78,660-114-230-B-45  
W2GNS.....45,600-76-200-C-30  
W2AZS.....39,312-78-168-C-45  
W2IRV.....37,800-84-150-B-30  
K2CF.....27,300-64-140-B-  
K2DCJ.....23,010-65-118-A-30  
W2SGK.....15,444-54-96-C-20  
W2KTF.....14,326-58-83-B-14  
W2NUO.....13,950-50-93-A-60  
W2MUM.....12,642-49-86-A-25  
K2DGT.....6804-36-63-AB-25  
W2VDT.....3166-24-44-B-  
W2FCT.....3150-21-50-B-21  
W2DLO.....3132-29-36-15  
W2JB.....2241-22-34-B-11  
W2DTL.....1710-19-30-A-20  
W2EEN.....1254-19-22-B-8  
K2CMV.....1170-15-26-B-8  
K2GXL.....510-10-17-A-2  
W2MZX.....126-6-7-  
W2LRJ.....102-6-6-B-7  
K2DEM.....27-3-3-B-20  
K2ENO.....27-3-3-A-26

### Northern New Jersey

W2AIW.....110,166-122-301-C-16  
W2ZGB.....82,485-117-235-B-80  
W2EQS.....81,184-118-230-B-85  
W2CWK.....62,192-104-200-AB-48  
W2BOK.....26,019-59-147-B-29  
W2JME.....18,432-64-96-B-21  
W2TWC.....15,912-52-102-AB-17

K2CBB.....12,314-47-88-B-13  
W2DRV.....12,000-48-84-B-26  
W2GKE.....6076-31-66-B-22  
W2GDX.....4884-37-44-B-13  
W2CVW.....1734-17-34-B-  
W2ZXL.....1605-15-36-B-19  
K2GLQ.....1377-17-27-B-10  
K2EPP.....1152-16-24-A-22  
W2EHN.....960-16-20-A-20  
W2SCV.....429-11-13-B-1  
K2GFX.....333-9-13-A-14  
K2EUI.....12-2-2-A-1  
W2FXZ (W2FXZ, KN2KFP)  
9143-41-75-B-50

### Missouri

W0BMM.....0,36,720-80-153-C-85  
W0CVZ.....34,428-76-151-B-44  
W0ANF.....25,792-64-135-AC-37  
W0QDF.....22,491-63-119-C-35  
W0BPA.....22,156-58-128-B-54  
W0LBB.....12,900-50-86-B-23  
W0PGJ.....1920-20-32-B-15  
W0PWN.....1404-18-26-A-20  
W0LLU.....924-14-22-A-  
W0EZX (W0s EZU GVI LHY  
MNV)  
19,824-56-118-80

### Nebraska

W0BUR.....7140-35-68-A-18  
W0AIN.....1843-19-33-B-7

## NEW ENGLAND DIVISION

### Connecticut

W1BHH.....146,861-143-343-B-50  
W1TYQ.....140,448-152-308-C-45  
W1ODW.....104,775-127-275-B-67  
W1TX.....101,748-122-278-BC-46  
W1AW3.....80,736-116-232-C-40  
W1DIT.....78,648-116-226-C-44  
W1AB.....48,321-91-177-C-45  
W0VBQ.....47,901-96-168-B-40  
W1TSZ.....32,640-80-136-AB-50  
W1NI.....23,530-65-122-C-53  
W1WY.....17,280-60-96-A-24  
W1PFF.....14,268-58-82-B-56  
W1JTD.....13,920-58-80-B-  
W0LAT.....297-9-11-B-15



**Timber!** While he transmitted "569 KANSAS" to HADW the first morning of the c.w. affair, W0DAE's 70-foot tower collapsed. Undaunted, Jack carried on with makeshift skyhooks, got 104,538 points, tops for his call area and section. Dry those tears of sympathy, fellows! DAE is back in business with an effective assortment of rotaries, doublets and ground planes.

## NON-W/VE LEADERS

C.w.	'Phone
KH6MG 489,066	KH6IJ 162,486
KH6IJ 461,700	VP7NX 148,665
VP7NM 453,725	W6WVR 127,098
XE2OK 308,636	PJ2AF 101,475
ZL1BY 306,408	KH6PM 90,576
KG4AJ 302,841	EL2X 81,405
KV4AA 296,140	HP3FL 73,017
KP4CC 247,400	VP9L 66,317
VP7NX 241,164	LU1EQ 63,300
KH6PM 237,006	KH6AXH 59,040
HK4DP 232,712	KG4AJ 55,044
KP4DH 220,779	XE2OK 53,998
KP4ZW 218,970	YN4CB 49,545

W1FTX.....11,918- 59- 83- B-14	W1TVZ.....1575- 21- 25-B-14
W1YYM.....9348- 38- 82- B-28	W1CPJ.....1350- 15- 30-A-14
W1AJO.....6852- 37- 62- B-23	W1BML.....27- 3- 3-B-10
W1APA.....6720- 63- 64- B-20	W1MX.....(W1YFM, W4YMJ,
W1GVK.....2500- 25- 34- B-20	W9GQL) 43,848- 87-16S-C-49
W1NLM.....1530- 17- 30- B-20	
W1HV.....1056- 16- 22- B- 8	
W1BDI*.....450- 10- 15- B- 5	
W1RWS.....48- 4- 4- A- 2	
W1ZMB.....3- 1- 1- A- 1	
W1ICP*.....(W1s ICP WPO) 11,316- 46- 82- C-50	

### Maine

W1DLG.....100,564-124-271- -90
W1IKE.....59,712- 96-208-C-40
W1EF.....23,040- 64-120-B-15
W1VEH.....1728- 16- 36-B-15

### Eastern Massachusetts

W1AXA.....143,934-149-322-C-75
W1JEL.....139,722-146-319-C-75
W1AZY.....120,834-137-294-B-68
W1BOD.....113,577-131-289-C-55
W1TW.....65,376- 95-227-B-25
W1PEG.....32,234- 71-154-B-58
W1WLW.....29,308- 68-145- -33
W1JDE.....28,260- 60-157-C-34
W1HX.....12,648- 62- 68-B-35
W1QJR.....12,120- 40-101-B-38
W1AQE.....10,560- 44- 80-A- -
W1NS.....9520- 40- 80-B-24
W1SX.....8880- 37- 80-B-23
W1JSM.....5106- 37-138-A- -
W1PYM.....2451- 19- 43-B-10
W1LQQ.....1663- 17- 33-A- 8
W1CTW.....1632- 16- 34-C- 8
W1BND.....1584- 16- 33-A-12

### Western Massachusetts

W1UYY.....15,600- 52-100-B-32
W1CLX.....14,124- 44-107-B- 8
W1EFQ.....13,432- 46- 98-C-19
W1ZD.....9282- 39- 80-C-10
W1YQC.....7182- 38- 63-B-45
W1JYH.....1584- 22- 24-B- -
W1DGT.....1037- 17- 21-B- 7
W1HPA.....273- 7- 13-B-10

### New Hampshire

W1BFT.....171,687-151-379-B-75
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### Rhode Island

W1CJH.....49,941- 93-179-B- -
W1AWE.....23,184- 56-138-C- -
W1RFQ.....144- 6- 8-A- 4

### Vermont

W1QMM.....20,460- 62-110-B-28
W1RWP.....5148- 33- 52-B-17
W1SPK.....1302- 14- 31-B-10

## NORTHWESTERN DIVISION

### Idaho

W7VWS.....570- 10- 19-A- 8
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### Montana

W7CJB.....6873- 29- 79-B- 4
W7PCZ.....3045- 27- 45-B-20

### Oregon

W7DAA.....63,480- 92-230-C-62
W7AHX.....35,397- 69-171-B-50
W7OCL.....20,034- 53-126-C-60
W7JLU.....12,726- 42-101-B-24
W7TML.....1758- 26- 61-C-28

### Washington

W7PQE.....78,225-105-249- C-65
W7JAS.....40,044- 71-188- C-35
W7GWD.....39,831- 71-187- C-56
W7NLI.....24,882- 58-143- C-20
W7HJC.....9798- 46- 71- C-19
W7JIC.....8640- 36- 80- A-36
W7TZ.....4200- 28- 50-BC-44
W7UQY.....1938- 17- 38- C-40
W7FZB.....225- 5- 15- A- 8
W7BUL.....4780- 5- 12- A- 6

## PACIFIC DIVISION

### Nevada

W7VIU.....3864- 23- 56- B-20
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### Santa Clara Valley

W6VE.....73,830-107-230-C- -
W6HOC.....69,042-106-219-C-50
W6SR.....62,928- 92-228- -
K6DCE.....16,215- 47-115-A-53
W6EFF.....7560- 36- 70-C-15
W6DWJ.....4752- 24- 66-B-50
K6EBB.....759- 11- 23-B- -

### East Bay

W6TL.....15,792- 47-112- C-29
W6QDE.....14,076- 46-102- C-21
W6IPH.....11,934- 39-102- B-45
W6FLT.....11,514- 38-101- C-26
W6MHB.....9030- 35- 86- C-14
W6CTL.....5508- 27- 68- B- -
W6LMZ.....1836- 18- 34- B- -
W6EJA.....1575- 15- 35- - 4
K6AUC.....1134- 14- 27- A- -
W6TT (W6s CGG MVQ PYH TT) 284,271-197-481-AR-86
W6LDD (W6s DZZ LDD MEK) 112,266-126-297- C-90
W6IDY (W6s IDY UZX) 74,970-102-245- C-48
W6KEK (W6s CTL KTK) 25,842- 59-146- B- -
W6OT (W6s OT PHI QUV UES, K6s AUD HFB) 1209- 13- 31- B-24

### San Francisco

W6WB.....119,340-130-306- C- -
W6GPB.....91,176-116-262- C-30
W6BYB.....80,010-105-254- C-66
W6BIP.....76,464-108-236- B-38
W6ATO.....62,517- 91-229- C-82
W6GWQ.....21,840- 56-130-BC-48
W6GQK.....18,450- 50-123- C-42
W6YC.....7548- 34- 74-AB-20

### Sacramento Valley

W6GHG.....32,913- 69-153-C- -
W6ONZ.....30,132- 62-162-C-73
W6CIS.....20,680- 55-126-B-25
K6EDE.....12,096- 42- 96-A-60
W6BIL.....1710- 19- 30-B-17
W6HIR.....1188- 18- 22- -20
W6DTJ.....168- 7- 8-A- -
W6IRA.....3- 1- 1-A- -

### San Joaquin Valley

W6KEV.....124,605-135-309- C-64
W6EFV.....16,800- 50-112- - -
W6UJ.....15,150- 50-101- C- -
W6BYH.....9600- 40- 80-BC- 8
W6MPG.....3450- 23- 50- C-18
W6BVM.....510- 10- 17- B- 3

## ROANOKE DIVISION

### North Carolina

W4CEN.....330,336-222-496-C-60
W4UXI.....122,264-136-301-C-75
W4LZF.....120,096-144-278-B-50
W4MZP.....115,506-138-280-C-76
W4RRK.....6068- 37- 57-B-32
W4MR.....1512- 21- 24-B- 8
W4VEO.....12- 2- 2- - 1

### South Carolina

W4GQE.....49,383- 93-177-B-69
W4BAN.....1428- 17- 28-B-20
W3HH/4.....1008- 16- 21- - 5

### Virginia

W4KFC.....426,024-244-582-C-87
W4DHz/4.....370,962-222-557-C-85
W4YHD.....188,543-167-377-C- -
W4OM.....187,488-168-372-C- -
W4CC.....105,705-135-261-C-60
W4PNK.....96,840-120-269-C-72
W4JAT.....56,160- 96-195-C-67
W4KXV.....49,632- 94-176-B-60
W4WVN.....31,884- 82-154-B-80
W4YZC.....27,573- 47-153-B-21
W4VZQ.....18,005- 65- 93-A-14
W4HJK.....9030- 43- 70-B-20
W4IA.....7904- 38- 71-B-17
W4SHX.....5032- 34- 50-B-22
W4SJJ.....2331- 21- 37-B- 6
W4WBC.....2016- 21- 32-B-10
K4CAR.....816- 16- 17-B-13
W4CJC (W4s CJC KRW) 9594- 41- 78-B-35

### West Virginia

W8PQQ.....220,473-187-393-C-69
W8UMR.....18,150- 55-110-B-22
W8CDV.....1880- 20- 32-B-10
W8AVW.....540- 12- 15- B-4

## ROCKY MOUNTAIN DIVISION

### Colorado

W6AZT.....55,272- 94-196-C- -
W6SBE.....23,994- 62-129-C- -
W6IXF.....15,198- 51-100-B-44

### Utah

W7QDJ.....17,748- 51-116-A-45
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### Wyoming

W7PSO.....13,287- 43-103-C-30
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## SOUTHEASTERN DIVISION

### Alabama

W4CEB.....1620- 20- 27-B- 7
W4WOG.....918- 17- 18-B-10

### Eastern Florida

W4LVV.....87,822-125-233-B- -
W4VHN.....18,330- 65- 94-A- -
W4LQN.....12,300- 50- 82-A-30
4DXL.....3159- 27- 39-B-14
W4EEO.....1083- 19- 19-B- 5
W4ZKQ.....359- 9- 13-A-20

### Western Florida

W4AFS.....13,426- 49- 92-B-45
W6HRI/4.....7596- 36- 71-B-48

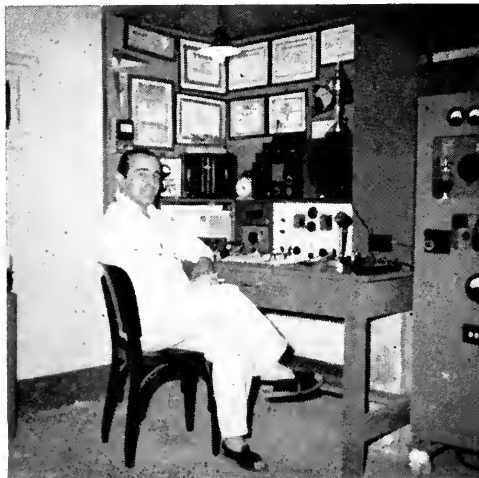
### Georgia

W4BBP.....45,414- 87-174-B-32
W4TED.....30,618- 63-162-B-58
W4CYA.....26,784- 72-124-B-42
W4SOV.....2244- 22- 34-B-10
W4BXV.....189- 7- 9-A-10

## SOUTHWESTERN DIVISION

### Los Angeles

W6VUP.....165,600-160-345-BC-85
W6RW.....148,920-146-340- C-84
W6MBA.....126,153-131-321- C-65
W6FSJ.....118,491-127-311- C-60
K6CIT.....104,544-121-288- C- -
W6VSS.....92,547-113-273- C-36
W6BUD.....89,562-114-253- C-60
W6SWG.....82,176-107-256-BC-70
W6OXS.....78,936-104-253- C-64
W6NZW.....63,147- 97-217-AC- -
W6MUR.....59,040- 96-205- C-45
W6CUQ.....57,132- 92-207- C-42
W6OYD.....48,762- 86-189- C-80
W6HJT.....40,716- 78-174- C-34
W6NWL.....34,650- 70-165- B-60
W6NJU.....33,252- 68-163- A-70
W6NTR.....33,228- 71-156- A-28
W6HJK.....26,448- 57-152- A-70
W6APH.....23,490- 58-135- C-57



An 813 at 200 watts, a Super Pro, and 75 hours of plodding netted PYTAN a total of 109,620, fourth in America del Sur, and the Brazilian c.w. Certificate of Performance.

W6UED.....22,344- 56-133- A-72  
W6NKR.....20,691- 57-121- C- -  
W6JFF.....16,371- 51-107- - -  
W6ID.....13,482- 42-107- C-33  
W6IY.....13,080- 40-109- C-10  
W6LDR.....9447- 47- 67- C- -  
W6KNE.....5829- 28- 67- B-30  
W6HPB.....3510- 26- 45- B-15  
W6AUZ.....2320- 21- 40- B-4  
W6DNH.....1665- 15- 37- A-10  
W6CUB.....1440- 15- 32-AB-18  
W6GEB.....792- 11- 24- C-2  
W6YMD (W6s AOA BXL FUF  
IPW IBZ KPV OZ PB YMD)  
363,480-233-520- C-86  
W6ITA (W6s ITA OEG ENV)  
314,822-12-495- C-92  
W6LDJ (W6s EEK KRI LDJ  
LHN NKU)  
244,620-180-453-BC-93  
W6AM (W6s AM GFE KSF QMC)  
185,370-167-370- C-80  
K6BFC (K6s BFC EAP)  
22,156- 58-128- A-80  
K6CYT (K6s EGF CVU CYT)  
3762- 22- 57- B-50

**Arizona**  
W6GAL/7.....254,592-192-442-C-88  
W7PZ.....3024- 28- 36-B-18  
W7ENA.....2280- 20- 38-A-22

**San Diego**  
W3MSK/6.....64,512- 96-224-A-55  
W6LRU.....50,463- 89-189-A-55  
W6CAE.....22,743- 57-135-B- -  
W6CHV.....16,800- 50-112-B-40  
W6LJQ.....12,789- 49- 87-B- -  
W6CRT.....10,152- 36- 94-B-12  
W6BZE.....8424- 36- 78-C-42  
K6EBH.....7140- 34- 70-A-11  
W6MCY.....5184- 32- 54-B-28  
K6DCB.....4941- 27- 61-A-24  
K6BEC.....2640- 22- 40- 2  
W6JVA.....2268- 18- 42- - -  
K6CTQ.....1050- 14- 25-A-14  
W6MGT.....804- 12- 23- -13  
W6BGB.....540- 10- 18-B-6  
K6CUZ.....60- 4- 5-A-1  
K6DNO/6.....3- 1- 1- 1-1

**Santa Barbara**  
W6ULS.....79,380-108-245-C-75  
W6ALQ.....60,210- 90-223-C-34  
W6YKH.....53,311- 89-203-C- -  
W6AGO.....22,110- 67-110-C-22  
W6PQJ.....6912- 32- 72-C-13  
W6GTI (W6s CEM GTI RRR)  
134,670-134-335-C-90

## WEST GULF DIVISION

**Northern Texas**  
W5QF.....11,592- 46- 84-B-22  
W5DXW.....10,363- 43- 81-B-44  
W5KUJ.....8127- 43- 63-C- -  
W5AJA.....7560- 45- 56-B-30  
W5CAY.....5704- 31- 62-B- -  
W5AWT.....3726- 27- 46-B-15  
W5BJA.....3105- 23- 45-A-15  
W5VNW.....504- 12- 14-B-6

**Oklahoma**  
W5LW.....35,964- 74-162-B-50

**Southern Texas**  
W5ZD.....80,682-119-226-BC-65  
W5VIR.....49,383- 93-177- A-62  
W5MCO.....10,164- 44- 77- A-63  
W5BTS.....2904- 24- 41- A-25  
W5ZWR.....1620- 18- 30- A-11  
W5SU.....2288- 8- 12- B-3

**New Mexico**  
W5DWT.....110,336-128-288-C-59  
W5VRP.....35,112- 76-154-B-70  
W5FTP.....1122- 17- 22-B-10

## CANADIAN DIVISION

**Maritime**  
VEIEK.....20,349- 57-357-A-27  
VO6N.....10,908- 36-101-B-60  
VO2B.....10,450- 38- 93-B-30  
VEICU.....7665- 35- 73-A-16  
VEIHG.....2112- 22- 32-B-15

VO6U.....360- 10- 12-A-2  
VOID.....264- 8- 11-A-7  
VEINN (VEIs ABC FF KM KW  
OUSS).....78,146-111-233-B-84  
VEIYU (VEIs BD FB YU)  
20,041- 49-137-B-64

**Ontario**  
VE3IR.....11,613- 49- 79-B-46  
VE3BHS.....2112- 22- 32-A-21  
VE3VU.....1380- 20- 23-B-5  
VE3DJD.....192- 8- 8-B-12

**Quebec**  
VE2BP.....10,296- 39- 88-B-50

**Alberta**  
VE6VK.....18,513- 51-121-AB- -  
VE6MN.....3654- 21- 58- C-18  
VE6NX.....1957- 19- 35- B-11

**British Columbia**  
VE7KC.....7805- 35- 75-B-20  
VE7FC.....5712- 28- 68-B-25  
VE7ZM.....5508- 27- 68-B-10

**Manitoba**  
VE4RO.....137,160-127-360-C-65  
VE4TJ.....1560- 20- 26-B-12

**Saskatchewan**  
VE5PM.....5859- 31- 63-A-45  
VE5JV.....378- 9- 14-B-8

## AFRICA

**Algeria**  
FA9RW.....97,290- 47-694-A-60  
FASDA.....53,724- 44-408-A-30

**Anglo-Egyptian Sudan**  
ST2AR.....20,475- 25-273-B- -

**Angola**  
CR6AL.....104,400- 40-871-B- -  
CR6CS.....3630- 11-111-A-12

**Belgian Congo**  
OQ5GU.....113,490- 45-545-A- -

**Canary Islands**  
EASBF.....93,120- 40-778-A-54

**Ethiopia**  
ET3S.....2808- 12- 78-A- -

**French Morocco**  
CNSEB.....7423- 13-191-A-10

**French West Africa**  
FFSJC.....29,526- 37-266-AB-11

**Gambia**  
ZD3A.....735- 7- 35-A-1

**Liberia**  
EL2X.....182,373-53-1147-B-54

**Madagascar**  
FB8BR.....1590- 10- 53-A-8

**Madeira**  
CT3AB.....46,020- 65-236-A-15

**Mozambique**  
CR7AF.....2688- 16- 56- A-9  
CR7LU.....1080- 8- 45- A-14  
CR7CO.....792- 12- 22-AB- -

**Northern Rhodesia**  
VQ2GW.....8640- 20-144-A-10

**Rio de Oro**  
EA9DF.....127,661-37-1152-A-74

**Southern Rhodesia**  
ZE5JA.....26,730- 30-297-A-36

**Spanish Guinea**  
EA0AC.....8840- 26-115-B-8

**Spanish Morocco**  
EA9AP.....37,888- 32-396-A-22

**Tanganyika**  
VQ3CC.....1248- 8- 53-A-8

## Tangier Zone

KT1UX.....69,996- 39-59S-B-32

## Union of South Africa

ZS5U.....22,380- 30-251-A-45  
ZS1PD.....2112- 11- 64-A- -  
ZS6AJO.....1862- 14- 45-A-9  
ZS1RM.....120- 4- 10-A-1  
ZS1OU.....24- 2- 4-A-1

## ASIA

### Hong Kong

VS6CQ.....448- 2- 76-A- -  
VS6AE.....290- 2- 49-A-6

### Japan

JA1CJ.....50,715- 35-185-AB-61  
JA3AF.....38,529- 27-176-BC-84  
JA3AB.....25,766- 26-339- B-47  
KA2OJ.....21,947- 17-333- B-24  
JA1CR.....15,428- 19-271- B-37  
JA1VX.....14,648- 19-263- C-44  
JA4BB.....10,458- 18-196- B-20  
JA7BO.....4355- 13-112- A-35  
JA1SR.....1998- 9- 76- A-28  
JA9AA.....936- 8- 39- A-7  
JA8AH.....885- 5- 59- A- -  
JA8AQ.....763- 7- 37- A- -  
JA1AS.....250- 5- 15- A-4  
JA7AZ.....125- 2- 25- A- -  
JA7AD.....84- 2- 14- A-3  
JA7ES.....64- 2- 9- A- -  
JA1ACA.....18- 2- 3- A-1  
JA3BB (JA3s BB DM)  
7290- 15-162- B-25

### Lebanon

OD5AX.....737- 11- 24-A-9

### Ryukyu Islands

KR6LJ.....40,560- 26-520-C-47

### Singapore

VS1BJ.....1025- 5- 69-B- -  
VS1GO.....48- 8- 2-A- -

## EUROPE

### Austria

OE5JK.....57,540- 28-685-A- -  
OE2JG.....14,400- 25-192-A-96  
OE5AH.....6003- 23- 88-A-41  
OE13USA (K2IXD, W6HVN)  
98,805- 35-949-B-60  
OE2SP (OE2s PPPS)  
7616- 16-160-A- -  
OE13OM (OE13s OM YL)  
45- 3- 5-B-3

### Azores Islands

CT2BO.....7476- 21-119-A-13

## Balearic Islands

EA6AF.....34,488- 36-322-A-25

## Belgium

ON4TQ.....13,872- 17-273-B-25  
ON4QS.....7200- 15-160-A-28

## Corsica

F9QV/FC.....14,275- 25-192-A- -

## Czechoslovakia

OK1MB.....77,560- 40-654-A- -  
OK1LM.....19,136- 26-247-A- -  
OK3DG.....2030- 10- 68-B-5

## Denmark

OZ1W.....43,290- 30-488-A- -  
OZ7G.....16,226- 19-286-A-20  
OZ7BG.....11,730- 17-230-B-14  
OZ5PA.....10,678- 19-190-B- -  
OZ6OJ.....5076- 12-143-A- -

## Eire

EI9J.....57,924- 36-538-B-32  
EI9Y.....25,740- 22-393-B-31  
EI5F.....9280- 16-196-B-12  
EI5G.....6000- 15-137-B-14  
EI6G.....4732- 14-116-A-6  
EI9F.....2541- 11- 77-B-11

## England

G5RI.....89,712- 48-623-B-50  
G2QT.....31,096- 28-380-B-40  
G2HB.....15,916- 23-233-B- -  
G3HJJ.....7264- 16-152-B-30  
G3BLE.....4212- 13-108-B-19

## Faeroes Islands

OY7ML.....318- 6- 18-A- -

## Finland

OH6OB.....11,880- 18-220-A- -  
OH6NR.....7905- 15-176-B-35  
OH1PW.....5854- 14-141-A- -  
OH7NW.....1742- 13- 45-A-24  
OH2LA.....1128- 8- 47-A- -  
OH3NY.....870- 10- 29-A- -  
OH2OJ.....440- 10- 15-A-3  
OH3RA.....5- 1- 2-A-1

## France

F8VJ.....44,166- 34-438-A-36  
F9MS.....22,160- 25-299-A-36  
F7EH.....17,180- 20-287-A-34  
F8TQ.....9800- 28-119-A-18  
F8PM.....7540- 20-127-A- -  
F8TM.....2808- 18- 52-A-18  
F9RM.....2170- 14- 52-A- -  
F9DW.....858- 13- 22-A-6  
F3IB.....810- 10- 27-A- -  
F8SW.....810- 9- 30-A- -

## Germany

DJ1BZ.....138,462- 47-991- B-70  
DL1KB.....102,258- 46-746- B-57



Of all the areas around the globe, Asia has perhaps been hardest hit by the ionospheric doldrums of recent Tests. In 1955 Tokyo's JA1CJ, unimpressed by the propagation forecasts, stacked 485 QSOs for 50,715 points, the largest c.w. total out of the Far East since 1950. (Photo by JA1GTV)

DL4ZC.....91,875- 49-625- B-64  
DL1DX.....76,956- 44-583- B-46  
DL1JW.....45,623- 41-371- B-49  
DL1BR.....31,043- 37-280- A-4  
DJ2BC.....18,117- 27-225- B-52  
DL7AA.....14,670- 30-163- B-70  
DL1QT.....4608- 24- 64-BC-14  
DL9JF.....3666- 13- 94- B-4  
DL3OC.....1513- 17- 30- B-40  
DL4DX.....1130- 10- 41- B-27

#### Gibraltar

ZB2A (G3s) DBT GFM, BRS  
20,186).....6583- 29- 76- A- 7

#### Iceland

TF3MB.....44,544- 32-464-A- -  
TF3AB.....18,456- 24-257-A- -

#### Italy

I1NT.....29,970- 27-370-B-30  
I1BDV.....27,360- 24-380-B-4  
I1AMO.....5552- 16-117-B-17  
I1ER.....2904- 12- 83-B-54

#### Liechtenstein

HB1MX.....3666- 13- 95-B- 9

#### Malta

ZB1JRK.....3850- 10-129-A-18

#### Netherlands

PA0UN.....77,444- 38-680-A- -  
PA0VB.....25,560- 30-284-B-4  
PA0UV.....19,512- 24-271-B-4  
PA0XD.....12,816- 18-238-A-26  
PA0FAB.....10,512- 24-146-A-21  
PA0FLX.....8200- 20-137-A-4  
PA0TAA.....8142- 23-118-A-4  
PI1RRS.....6682- 26- 87-B-23  
PA0MDG.....5450- 25- 73-A-10  
PA0HJK.....3168- 16- 66-A-13  
PA0LY.....2240- 10- 86-A-4  
PA0OTC.....576- 8- 24-A-4  
PA0BRS.....513- 9- 20-A- 8  
PA0AGA (PA0s AGA UKC)  
594- 9- 22-A- -

#### Northern Ireland

GI3JEX.....990- 11- 30-B- -

#### Norway

LA6U.....8685- 15-194-A-4  
LA4SE.....4634- 14-111-A-30  
LA3HA.....3555- 9-135-A-20  
LA7X.....3448- 12- 97-A-19  
LA1IE.....1638- 13- 42-A- 8  
LA7KA.....1500- 10- 50-A- 8  
LA6YC.....957- 11- 29-A- 6  
LA3SE.....294- 6- 17-A- 9  
LA1K (LA5 6PB 7ZC)  
2301- 13- 59-B- 5

#### Portugal

CT1JS.....3510- 10-117-B- -

#### Roumania

YO3RF.....1550- 10- 52-A-20

#### Saar

9S4AX.....12,673- 23-187-A-50

#### Spain

EA4CR.....63,297- 39-541-B-96  
EA1AB.....60,822- 31-654-A-40  
EA3GF.....19,155- 15-427-B-4  
EA5CS.....12,150- 27-153-A-26  
EA1CP.....8192- 16-172-A-33  
EA4ED.....5148- 12-143-A-4  
EA3IH.....3380- 13- 88-B-10

#### Sweden

SM3AZV.....12,711- 19-226-B-4  
SM5ANY.....10,962- 21-174-B-28  
SM2VP.....9348- 19-164-B-12  
SL3AG.....7800- 25-104-A-4  
SM4BEC.....6669- 13-171-B-4  
SM2BCS.....6030- 15-134-B-4  
SM2ALU.....5759- 13-149-B-25  
SM5IZ.....3432- 13- 88-B-4  
SM2BZI.....2418- 13- 62-B-18  
SM3AKM.....2352- 14- 56-B-56  
SM7BHF.....855- 9- 32-B-4  
SM5PX.....513- 9- 19-A-19  
SM5CCE.....96- 4- 8-A- -  
SM5UO.....96- 4- 8-B-3  
SM7MS.....12- 2- 2-A- -

#### Switzerland

HB9CI.....6681- 17-132-A-12  
HB9RD.....3276- 14- 78-A-49  
HB9MU.....3006- 9-113-A-84

#### Trieste

I1BNU.....29,852- 34-293-A-56  
I1BLF.....11,088- 24-154-B-19  
I1BCB.....2873- 17- 57-A-17  
I1YCZ.....518- 7- 25-A-14

#### Wales

GW5SL.....30,384- 24-424-B-33

#### Yugoslavia

YU2AE.....15,774- 26-200-A-35  
YU2HG.....9126- 18-169-A-20  
YU2HV.....1305- 9- 55-A- 6

### NORTH AMERICA

#### Alaska

KL7AWB.....80,442- 41-657-C-30  
KL7AOL.....71,136- 39-609-B-38  
KL7BCH.....63,342- 34-621-B-55  
KL7MF.....576- 6- 32-A- 4

#### Bahamas

VP7NM.....453,725-78-1939-A- -  
VP7NX.....241,164-66-1218-A-30  
VP7NG.....130,624-52- 840-A-22

#### Canal Zone

KZ5BC.....36,224- 16-759-B-40  
KZ5NB.....14,025- 15-312-A-27

#### Cuba

CO2BM.....78,648- 29-904-A- -  
CM5HF.....2280- 10- 76-A- -

#### Greenland

OX3UD.....8762- 13-226-A- -

#### Gundeloupe

FG7XB.....2970- 18- 55-A- -

#### Guantanamo Bay

KG4AJ.....302,841-57-1771-C-64

#### Mexico

XE2OK.....308,636-76-1365-A-50  
XE1PJ.....9036-12- 251-B- 5

#### Puerto Rico

KP1CC.....247,040-64-1287- B-68  
KP4DH.....220,779-51-1450-AB-80  
KP4ZW.....218,970-54-1354- A-66  
KP4YL.....158,799-43-1233- B-50  
KP4YT.....39,312-42- 312- A-27  
KP4DV.....8417-19- 149- B- 3

#### St. Pierre and Miquelon

FP8AP.....39,990- 30-445-A-18

#### Turks and Caicos

VP5AE.....90- 5- 6-A- 1

#### Virgin Islands

KV4AA.....296,140-68-1453-B-31  
KV4BK.....106,950-31-1150-B-46

### OCEANIA

#### Australia

VK2GW.....97,014- 46-703-A-50  
VK2EO.....68,046- 33-683-A-4  
VK3XK.....23,556- 26-302-A-29  
VK7KM/7.....18,524- 22-283-A-26  
VK5FO.....8030- 15-181-A-4  
VK3XB.....7215- 13-185-A-21  
VK3AHH.....7062- 22-108-A-10  
VK5WO.....1677- 13- 43-A-12  
VK3CX.....960- 8- 40-A-4  
VK3HL.....856- 8- 36-A-4  
KV3KS.....3- 1- 1-A- -

#### Hawaii

KH6MG.....489,066-74-2203-C-69  
KH6JJ.....461,700-75-2052-C-74  
KH6PM.....237,006-63-1254-B-61  
KH6AYG.....211,526-58-1216-C-60  
KH6SP.....88,800-40- 740-B- -  
KH6ANK.....61,047-51- 399-B- -  
KH6WW.....11,250-25- 150-B- 6  
KH6IB.....9570-22- 145-A-32

#### New Caledonia

FK8AL.....1785- 7- 85-A- 7

#### New Zealand

ZL1BY.....306,408-68-1502-A- -  
ZL2GS.....106,869-49- 727-A-4  
ZL1MQ.....81,243-51- 531-A-37  
ZL4CK.....7293-17- 143-A- -

#### Philippine Islands

DU7SV.....56,064- 32-584-B- -

### SOUTH AMERICA

#### Antarctica

LU1ZV.....5151- 17-101-B- 4  
LU2ZV.....1530- 10- 51-B- 2

#### Archipelago of San Andres and Providencia

HK0AI.....32,384- 22-499-A- -

#### Argentina

LU3EX.....185,304-56-1103-B- -  
LU8AE.....156,774-53- 986-B-60  
LU8FBH.....31,119-23- 451-B-4  
LU7AS.....28,008-24- 389-B-32  
LU3CS.....12,177-11- 369-C- -

#### Brazil

PY7AN.....109,620- 45-812-B-75  
PY3QX.....19,499- 31-213-B-16  
PY1LZ.....5814- 17-114-A-12  
PY1AZO.....5712- 16-119-A-10  
PY3AHW.....3296- 16- 71-A- 5  
PY1ADA.....3090- 15- 69-B- 4

<sup>1</sup> W3BES, opr. <sup>2</sup> W0BMY, opr. <sup>3</sup> W1WPR, opr. <sup>4</sup> Hq. staff — not eligible for award. <sup>5</sup> PA0INE, opr.

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## 'PHONE SCORES

### ATLANTIC DIVISION

*Eastern Pennsylvania*  
W3DHM.....230,640-186-414-BC-76  
W3GHS.....158,410-165-318- B-58  
W3ECR.....124,200-150-276- C-81  
W3CUB.....64,842-107-202- C-30  
W3KTC.....37,848- 83-152- C-40  
W3EQA.....21,672- 62- 86- C-30  
W3CGS.....16,461- 59- 93- C-27  
W3IMV.....11,172- 49- 76- B-16  
W3EAN.....11,070- 45- 82- C-10  
W3QLW.....1980- 22- 30- B-13  
W3GHD.....1320- 20- 22- B- 3  
W3TJW.....1254- 19- 22- B- 8  
W3OCU.....1020- 17- 20- C- 3  
W3EVW.....720- 15- 16- C- 3  
W3LEZ.....672- 14- 16- C- 8  
W3GRS.....240- 8- 10- A- 3  
W3MDE.....75- 5- 5- A- 1  
W3GHM (W3s GHM KDF)  
75,864-109-232- C- -

#### Md.-Del.-D.C.

W3JNN.....86,697-117-249-C-40  
W3JTC.....27,648- 58- 96-B-28  
W3DRD.....21,090- 74- 95-C-32  
W3EQK.....300- 10- 8- C- 8  
W3HDV.....168- 7- 8- C- 8  
W3VAM.....90- 5- 6-B- 6  
W3BOV.....45- 3- 5-B-11  
W3NZT.....3- 1- 1-A-3  
*Southern New Jersey*  
K2EDL.....2880- 30- 32-A- 3  
W2WE.....663- 13- 17-B- 6  
K2CH.....533- 13- 15-B- 7  
W2SAI (W2SAI, W3BES)  
314,880-205-514- -80

#### Western New York

W2VQM.....9648- 48- 69-BC-18  
W2ROM.....7626- 41- 62- B-34  
W2TEX.....3321- 27- 41- B-18  
W2ICE.....3168- 32- 33- - 6  
W2FBA.....2352- 28- 28- C- 8  
W2PUN.....2070- 23- 30- A-20  
W2UTH.....675- 15- 15- B- 3  
W2WJP.....396- 11- 12- C- 9  
W2TXB.....192- 8- 8- C- -

PY6FU.....1624- 14- 39-A- 5  
PY2BNX.....621- 9- 23-A- 4  
PY1CK.....324- 6- 18-A- 2

#### Chile

CE3AG.....98,340- 44-745-B-27  
CE6AB.....45,430- 35-435-B- -  
CE4AD.....37,842- 34-371-B- -

#### Colombia

HK4DP.....232,712-76-1040-C-66  
HK4BD.....41,370-30- 465-B-46

#### French Guiana

FY7YE.....2025- 9- 75-A- -

#### Netherlands West Indies

PJ2AR.....94,031- 49-641-A-50  
PJ2AN.....72,468- 44-558-A-35

#### Paraguay

ZP9AY.....13,760- 20-232-AB- 9

#### Peru

OA4J.....4520- 10-155-B-35

#### Trinidad

VP4BN.....23,352- 28-281-B- 9  
VP4LW.....8100- 12-266-A- -

#### Uruguay

CX6AD.....63- 3- 7-A- 4

#### Venezuela

YV5BJ.....44,462- 43-345-B- -  
YV5AE.....28,980- 23-200-B- -  
YV5DE.....19,425- 35-421-B-10

W2SNI.....147- 7- 7- B- 2  
W2ZCC.....3- 1- 1- B- 5

### CENTRAL DIVISION

*Illinois*  
W9NII.....11,076- 52- 71- B-40  
W9ABA.....9360- 48- 65- C-20  
W9EPU.....8742- 47- 62- B-40  
W9SD.....3999- 31- 43- B-10  
W9FUD.....21- 3- 3- A- -  
W9AVJ (W9s GVZ NZM PKW)  
141,614-157-302- C-66  
W9LBB (W9s FSP QXO ZLS,  
WN9s IFP IRL)  
11,016- 51- 72-BC-90

#### Indiana

W9JIP.....27,729- 79-117-C-34  
W9ZTD.....4118- 29- 48-B-28  
W9PQA.....546- 13- 14-B-18  
W9EHU.....3- 1- 1-B- 1

#### Wisconsin

W9EWC.....139,500-155-300-C- -  
W9RBI.....20,202- 74- 91-C-18  
W9EZZ.....17,388- 69- 84-B-22  
W9FDX.....4884- 37- 44-B- -  
W9WJH.....1512- 18- 28-A-5  
W9OMZ.....1089- 11- 33-B- -  
W9VOD.....396- 11- 12-A-4  
W9ONY9.....48- 4- 4- -  
W9GIL.....36- 3- 4-B- -  
W9RKP.....27- 3- 3-B- -  
W9GWK.....3- 1- 1-B- 1  
W9UDK.....3- 1- 1-B 1

### DAKOTA DIVISION

#### North Dakota

W9EOZ.....9- 2- 3-B- 2

#### South Dakota

W9LBS.....1512- 18- 28-B-12

#### Minnesota

W9TKX.....192- 8- 8-B- 4

(Continued on page 134)





CONDUCTED BY EDWARD P. TILTON, W1HDQ

It is now more than two years since the first work of W4HHK, W4AO and W2UK in sending 2-meter signals over long paths by meteor scatter was reported in these pages. In this time tape recordings have been played and the general subject discussed in nearly all parts of the United States, and the work has attracted considerable favorable attention in scientific circles. Relatively few 2-meter men have been more than casually interested in the new method of working v.h.f. DX, however, and you can count on your fingers the number who have actually tried it.

Yet W4HHK, who was in there first, has had exciting success in working 2-meter DX by the meteor route. Two-way meteor communication with New Jersey (W2s UK, AZL and NLY) and Connecticut (W1HDQ) was achieved last year, the contacts with all but W2UK coming at the height of the Perseid meteor shower late August. The Perseids put on a show last August, peaking just before the middle of the month, so W4HHK was busy again this summer drumming up some schedules for exploitation of the opportunity they would afford in 1955.

New states were the objective, and there were at least two good prospects. W1FZJ, Medfield, Mass., a big-antenna man from away back as W8UKS, had been burning up the 2-meter band with a high-powered rig and a 64-element array. He was an almost certain bet for the first Tennessee-Massachusetts 2-meter QSO. Some sign of signals had been heard from W7VMP, Phoenix, Ariz., in the past, so Paul lined up a series of morning skeds with the Fenwick brothers, too.

A test with W1FZJ on Aug. 12th produced the first break. Using the one-minute-each-way method that had worked so well under marginal conditions last year, Sam and Paul started in at 0500 CST. Nothing was heard for 45 minutes, but at 0545 W1FZJ was heard calling and breaking. Complete exchange of signal reports and confirmations was accomplished between then and 0556.

Then followed an hour test sked with W7VMP, beginning at 0600 CST. Several calls and signs were copied, but no complete exchange was possible until the following morning. On the 13th, just an hour was consumed in exchanging calls and signs, signal reports and final confirmations. One not accustomed to meteor-scatter talk would not think much of the QSOs that are achieved by this hit-and-run approach, but the fact remains that useful information can be exchanged and positive identification established by the meteor-scatter method. You have to send

fairly fast, on c.w., and you have to try again and again, usually; but if we judge a QSO by whether or not useful information can be exchanged, then certainly these meteor-scatter tests qualify. Much more so than some of the exchanges that pass for QSOs in DX pile-ups or during some of our more hotly-contested operating activities on lower frequencies!

The W1FZJ-W4HHK contact was good for more than 1100 miles, and the W7VMP haul is just under 1300. The limit? Who knows, for sure? What we need is more of this sort of thing, to find out. Surely meteor scatter represents a way to communicate with states and over paths that are highly unlikely to be bridged on 144 Mc. by other means. It put W4HHK at the top of the



W0ZJB.....48	W4IUJ.....38	WSYLS.....41
W0BJV.....48	W4BEN.....35	WSOJN.....40
W0CIS.....48		
W5AJC.....48	W5VY.....48	W0ZHB.....48
W9ZHL.....48	W5SFW.....47	W9QVU.....48
W9OCA.....48	W5GNQ.....46	W9HGE.....47
W6OB.....48	W5ONS.....45	W9PK.....47
W0INI.....48	W5JTI.....44	W8VZP.....47
W1HDO.....48	W5MLL.....44	W9RQM.....47
W5MJD.....48	W5ESC.....44	W8ALU.....47
W2IDZ.....48	W5JLY.....43	W9QKM.....47
W1LLI.....48	W5JME.....43	W9UIA.....45
W0DZM.....48	W5VV.....42	W9UNS.....45
	W5FAL.....41	W9MFH.....36
	W5HEZ.....41	
W1GJO.....47	W5HLD.....40	W9HVV.....48
W1CLS.....46	W5FXN.....38	W0QIN.....47
W1CGY.....46	W5LIU.....37	W9NFM.....47
W1LSN.....45		W0TKN.....47
W1DJ.....41	W6WXX.....48	W0KYF.....47
W1RFU.....41	W6ANN.....45	W9WKB.....47
W1FOS.....32	W6TMI.....45	W9JOL.....46
	W6IWS.....41	W9MVG.....46
W2MEU.....47	W6ABN.....35	W0TJF.....44
W2AMJ.....46	W6GCG.....35	W0URQ.....44
W2BYM.....46	W6BWG.....30	W0JHS.....43
W2RLV.....45		W0PFI.....43
W2FLJ.....44	W7HEA.....47	W0PLI.....41
W2GYV.....40	W7ERA.....47	W0ORE.....37
W2OWI.....38	W7BQX.....47	W0FKY.....32
W2ZOW.....36	W7FDJ.....46	W0USQ.....30
	W7DDY.....45	
W3OJU.....46	W7JRC.....44	
W3TIF.....42	W7ACD.....43	VE3AET.....44
W3NKM.....41	W7BOC.....42	VE3ANY.....42
W3OTC.....40	W7JPA.....42	VE1QZ.....34
W3MQV.....39	W7FIV.....41	VE3AIB.....34
W3KMY.....38	W7CAM.....40	VE1QY.....31
W3MNX.....38		VE3DER.....29
W3LFC.....37		NE1GE.....25
W3RUE.....37	W8NSS.....46	CO6WW.....21
W3FFH.....35	W8NQD.....45	
	W8UZ.....45	
W4FBH.....46	W8RFW.....45	
W4EQM.....44	W8CMS.....45	
W4QNY.....44	W8QDU.....43	
W4CPZ.....44	W8LOD.....42	
W4FLW.....42		
W4QXC.....41		
W4MS.....40		
W4FNR.....39		

Calls in bold face are holders of special 50-Mc WAscertificates listed in order of award numbers. Others are based on unverified reports.

states-worked standings, with 28, and he is the only operator known to have worked 9 call areas on 144 Mc. Shouldn't this be enough to stir up some interest on the part of other 2-meter DX hounds?

The possibilities of the 6-meter band in this department should not be overlooked, either. In fact, the chance of working long hauls under otherwise dead-band conditions is probably much better on 50 than on 144 Mc. The potentialities of the 50-Mc. band will remain hardly more than touched, so long as the vast majority of 6-meter men operate with low power, small antennas, no better than mediocre receivers, and voice. At least a few of us should be going for the limit in all these categories, and on c.w. There are some surprises in store on 6, we're sure, when we give it the full try.

### Here and There on the V.H.F. Bands

The discussion of national calling frequencies for the v.h.f. bands (August *QST*, page 57) has so far brought only three written responses. W1DPO, Chatham, Mass., and WN9OKB, who travels widely, are all for the idea. W3OTC likes the idea too, but suggests other channels than the 50.1- and 144.6-Mc. in the original proposal.

Bob feels that the 6-meter channel should be in the lower c.d. segment, and suggests 50.4 Mc., already widely used by nets in many parts of the country. He says that members of a fixed-frequency net in Annapolis have worked 18 states with both transmitters and receivers set on this channel. For the 2-meter band, W3OTC wants the channel to be in the Novice band. This also takes care of the c.d. angle, but no specific suggestion has been made as to what the frequency should be. Suggestions?

A special frequency to monitor would be helpful to fellows situated like XE1GE, Cuernavaca, Mexico. Jeff has heard DX signals in the region just below the 50-Mc. band many times when no amateurs could be heard. It is interesting

to note that he has found some resumption of the spring-fall 50-Mc. DX between Mexico and South America in 1955, after a lapse of several years. XE1GE heard harmonics of Latin American stations in and near the 6-meter band several times in March and April. LUSAE and LU4BJ were worked on March 12th, his first South American DX on 6 in 4 years.

Single-hop contacts were made with several W5s during the May-to-July *E.* season, and on July 21st, W1CLS, W1VNH, W1HDQ and W2MEU were worked, between 2000 and 2045 CST. These are the first XE — W1 and 2 contacts since about 1950, as far as we know. The 50-Mc. DX in May, June and July was better all over the country than in several years past, so it looks as if we're on the upgrade again.

The  $F_2$ -layer predictions issued by the Central Radio Propagation Laboratory begin to look interesting again, too. The charts for November actually show a small ellipse of 50-Mc. m.u.f. just above Latitude 20 North in the Pacific Ocean area. KH6s please take note! North Africa, Southern Europe and South America give indications that 50 Mc. might be open for  $F_2$  DX on the peak days in both October and November.

Here's a late 50-Mc. DX report. (Late because it came to your conductor's home address, and got mislaid in personal papers. Moral: Mail v.h.f. news to ARRL Headquarters, *not* the home address of W1HDQ!) VP9AY made what is believed to have been the first 50-Mc. contact from Bermuda, working W2KNQ, on June 23rd. W21DZ and W2MEU were worked the same night. On June 26th, Max (now W1TJZ) worked W2OHJ. W8CMS, W8SVY, W8NQD, W3ZKR and W8IHH between 1935 and 2245 Bermuda time. Signals were heard from W1, 4, 6, 7 and CO.

VP9BM writes that while he is doing his best to work some 144-Mc. DX from Bermuda (he's on 144.35 Mc.) he is working on a receiver to provide continuous monitoring of the f.m. services just below the 50-Mc. band, to give him tip-offs on possible 50-Mc. DX to W.

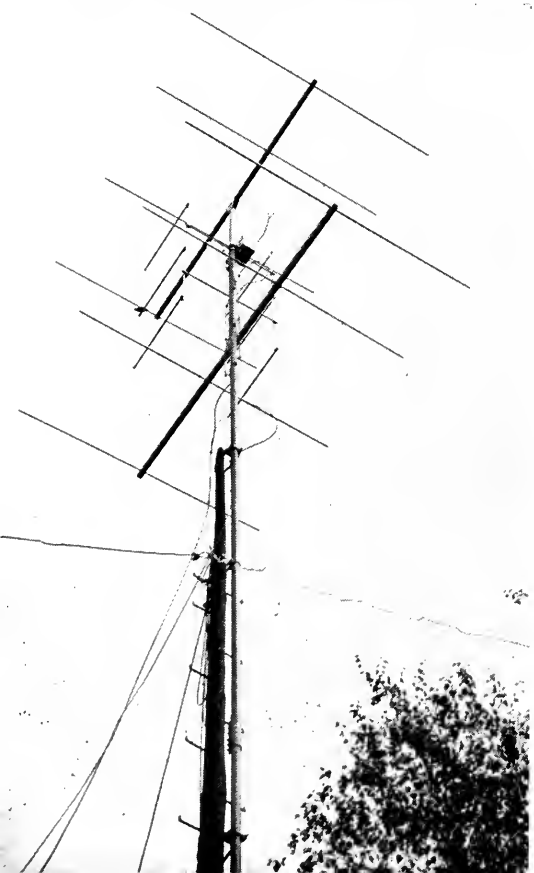
In addition to his 5-over-5 that's 120 feet above ground in Johnstown, Pa., W3TIF has erected a 4-element array atop 2700-foot Pleasantville Mountain near by. Doc drives up there and operates his TBS-50, and occasionally a 200-watt 24G amplifier, in search of contacts with Vermont and Rhode Island, two of the six states he now lacks for WAS on 6.

Members of the Andrews Electronics Association, whose 50-Mc. club project was described in August *QST*, operate their Windbag Net each Tuesday night at 1900 local time. Frequency is 50.4 Mc., and at present 10 members are active. Daily at 1730 EST an informal get-together is held, this spreading out over Pennsylvania, New Jersey and Delaware. Everyone is invited to join in helping to keep the band hot through the fall and winter months. This from W3RV and W3ZQD, who started the ball rolling.

Two more 50-Mc. men reached the coveted 48-worked spot this month. W0DZM, Minneapolis, who had been on the hot seat with 47 for years, finally caught up with W7JRG, Billings, Mont., and got the cards through in time to qualify for special 50-Mc. WAS Award No. 13. W0HVV, Pleasant Hill, Mo., was the beneficiary of an expedition to Rulo, Nebr., by W0QZT. W0HVV had done this same favor for W0INI a couple of years ago, so it was quite fitting that he should make his 48th in a similar manner. The Nebraska activity, what little there has been in recent years, has been beyond the reach of Missouri stations, even though the two states share a common boundary in some 50 miles of the Missouri River. The cards for official confirmation have not yet been received from W0HVV as we write but he is in line for No. 14. The W0QXT expedition also provided first Nebraska contacts for W0s PYK TOQ VFF VRF WNU and YKI.

This array helped to make the first 50-Mc. WAS by a W2. The stacked 4-over-4 at W21DZ, Denville, N. J., has a 12-element 2-meter job in between the 6-meter bays. The 2-meter portion may see some service now that Ed has nailed down the elusive 48 on 50 Mc.

**QST for**



Ed Ladd, W2IDZ (right), shows off his 50-Mc. WAS certificate, while the team who helped make the achievement possible look on. Left to right, Roy Sebring, W2QCY, Reh Allen, K2ODA, and George Whattam, W2CZE, of the W2QCY/7 50-Mc. expedition to Utah and Nevada. Event pictured was a picnic in honor of these 6-meter stalwarts at the Greenwood Lake home of W2KNO.



V.h.f. men of central New York are invited to a V.H.F. Round-up being planned by the Syracuse V.H.F. Club, Saturday, Oct. 15th. Starting time will be 2 P.M. Location: Frank Taylor's on Route 11, North Syracuse. Speaker: Art Koch, W2RMA, well known for his v.h.f. and microwave gear in the *GE Ham News* and *QST*. Price: \$2.50, including dinner. Tickets and further information from Joe Lando, K2JIM, R.D. 1, East Syracuse.

Contacts over the Cascade Mountains to Eastern Washington on 144 Mc., distances of 150 to 250 miles, are reported by W7JIP, Portland, Ore. Higher power, big beams (horizontal) and better receivers are turning the trick. W7JIP's first contact over this route was with W7HEA, Toppenish, Wash. Both stations run about 500 watts. Contacts over the Cascades by W7LHL, Seattle, and W7s PYZ and UVH of Olympia, 130 miles, were mentioned last month. This work and the contacts over the mountains to Arizona from Southern California demonstrate that there is hardly any such thing as an "impossible" v.h.f. path at distances under 300 miles or so. The presence of high mountains in between you and your objective may actually improve your chances of covering the distance. Under ideal conditions this "obstacle gain" can reach quite remarkable proportions.

Another mountainous path broken down for the first time: W7JU, Boulder City, Nev., finally worked W7FGG, Tucson, Ariz., 353 miles, after almost a year of trying. W7JU runs 100 watts input, c.w., feeding a 6-over-6 horizontal array.

There never has been enough use of the consistently good conditions that prevail on the v.h.f. bands in the morning hours. VE3DER, Toronto, would like it known that she calls CQ to the west each morning at 9 on 144 Mc. If no contact is made she also tries east and south.

Two-meter mobile record? G2HCY asks if his contact with F9JY, Cherbourg, 250 miles, has been bettered by a 2-meter mobile station in this country. He was actually in motion at the time contact was made, traveling about 3 miles south of his home in Warrington, Lancashire. He has also worked EI2W while mobile, at a distance of more than 200 miles.

### Those States-Worked Boxes

Every few days someone writes in to know how to get his call listed in the 50- or 144-Mc. states-worked standings. The answer is that you just send in your record. No QSLs are needed, unless you are claiming WAS; in that case we must have proof in the form of 48 cards. A special hand-lettered and serial-numbered certificate is awarded to anyone who makes the grade on 50 Mc. and can prove it. We may have to get a 144-Mc. WAS award ready one of these days, at the rate some of the gang are going, but up to now we'll take your word for the number of states, call areas and best DX you've worked on 2.

Obviously, we can't list every active v.h.f. man in these boxes, so we try to spot the outstanding achievements in each call area. A W6 with 3 or 4 states has done an outstanding job, but a W1 or W2 with 12 may never have done anything noteworthy. W1MMN, in northern Vermont, has worked hard for his 10 states, so he stays in, but a Connecticut station with 12 hasn't done much yet, so he stays out. A rule-of-thumb check on whether you'll be accepted for listing is to see if your record is equal to or better than some fellow in your neighborhood who is already listed. If it is, you're eligible. And once you're in, be sure to let us know when you move up in any category.

Canadian Provinces do not count as states, and Canadian call areas do not count in the second column of the 2-meter listing. DX with a Canadian, Mexican or other non-U.S. station can be included for your best DX, however. Mobile or portable contacts made while more than 25 miles from

the licensed location are not acceptable for states claims by the mobile operator. Ship or aircraft stations are out, too.

We've received quite a few requests to begin listing similar accomplishments on 220 and 420 Mc. This would probably be done by skipping the 50- and 144-Mc. boxes occasionally, and running the box scores for the higher bands. If you want such a listing, now is the time to send in your records for those bands. If we get enough data we'll give the higher bands a whirl now and then. Include the number of states and call areas and your best DX worked on either band, or both, in your next report.

Special to Technicians — let's have your record for 50-Mc. work to date. We'll list any respectable total of states worked on 6 by a Technician. Don't feel that you have to wait to catch up with the fellows who have been at it for nearly 10 years!

### OES Notes

K2DYC, Phelps, N. Y. — Operating on 50.4 nightly, 7 to 9 P.M., looking for new stations. Western N. Y. activity on 6 very promising.

K2GAN, Murray Hill, N. J. — Experimenting with two-tube compact transmitter-receiver for 144-Mc. local communication, presently using two 12AT7s, and operating from 90-volt supply.

W2UTH, Victor, N. Y. — Much new activity on 50 Mc. Several Saturday morning skeds with W1HDQ, 250 miles, show slightly better signals on 50 than on 144, though evidence is inconclusive as yet.

W3OTC, Silver Spring, Md. — Good summer on 50 Mc. Worked 7 W6s on July 9th, along with stations in many other states. Band open more than half the days in July. VP9G worked July 19th.

W4FLW, Dresden, Tenn. — DX heard or worked 19 different days during July. Using converted Howard f.m. tuner to monitor 50-Mc. band. As it tunes broadly, signals will usually be heard if band opens well.

W5NSJ, Albuquerque, N. Mex. — Completed portable transmitter-receiver for 50 Mc. Works from 250-volt 100-ma. supply.

W5RFF, Albuquerque — Off the air due to damage to home and ham shack by flash flood. Antennas down; shack roof blown off, and ham library and QSLs ruined.

W5SCX, Ardmore, Okla. — Using Channel 10 transmitting antenna, W5LOW, Ada, Okla., was up more than 3 S units over normal signal. He worked Mississippi, Kansas and Texas Panhandle stations that were inaudible at W5SCX. The TV antenna is 700 feet above ground level.

W6CFL, Los Angeles, Calif. — Keeping nightly sked with K6KHD on 420 Mc.

W7JHX, Port Orchard, Wash. — Changed over to horizontal polarization in July, with varying results. Signals that were reflected from mountain peaks with vertical polarization now seen weaker and more subject to fading with horizontal. On the other hand, one of the stations so affected, VE7JG, Duncan, B. C., is able to work Seattle stations regularly with horizontal. These stations were not heard often with vertical. Check to be set up with W7BML, Port Angeles, Wash., who is on the opposite side of a 6000-foot range of mountains, at a distance of about 75 miles. Signals over this path have been mostly steady on vertical,

(Continued on page 132)



# Operating News



F. E. HANDY, WIBDI, Communications Mgr.  
GEORGE HART, WINJM, Natl. Emerg. Coördinator  
PHIL SIMMONS, WIZDP, Asst. Comm. Mgr., C.W.

ROBERT L. WHITE, WIWPO, DXCC Awards  
LILLIAN M. SALTER, WIZJE, Administrative Aide  
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., 'Phone

**The Simulated Emergency Test.** By far the most important first-of-season activity is the SET. For ARRL Emergency Coördinators this is also their "annual roll call" time, and a time to extend the continuing invitation to *all licensed amateurs* to register in the AREC.

The SET as explained more fully elsewhere in this issue is a practical communications test exercise based on communications plans for the locality. For those in leadership capacities, Emergency Coördinators and Radio Officers as well as AREC members, it is the kick-off for the new fall-winter season of activity and the proper time to initiate the SET as the first of some recurrent planned tests to be held during the year. Responsible officials for the city or area and agencies to be served should be contacted by ECs, both to maintain friendly relations and so that full advantage of the exercise to improve on past deployments of mobiles and facilities, or get a statement or message from officialdom to transmit as part of the exercise.

There should be a workout for emergency-powered equipments, and an attempt made to build up our capabilities in both size and quality of performance in connection with this chance to demonstrate all our operative mobile gear.

ARRL's new *Emergency Radio Unit* placards are available through ECs for temporary or permanent use with cars or rigs and should be utilized at this time wherever justified by the equipment. All AREC members with mobiles also should ask ECs about the *Official Mobile Unit* pocket cards where mobile equipment has been acquired since a previous AREC registration. This as well as the regular AREC identification card will be issued by ECs where warranted. Purpose of these forms is to insure the individual operator better public understanding of his public and amateur radio service functions. The ERU card on one's car or set-with-handles advertises the public service aspects and identifies amateur work as more than a casual hobby!

We encourage ECs to sign up Novice operators in AREC (and newly licensed General Class personnel) as well as amateurs working *all bands* regardless of specialized interest. The availabilities of WNs and Technicians when registered will be considered by ECs and ROs to man circuits and posts and assist in other ways in the larger emergency plans developed by the whole amateur group. It is essential to create and maintain "one strong facility" through AREC/RACES in connection with general emergency work and civil defense planning. There are not

enough persons with advance training and skill to meet most emergencies, so every registrant fills a real need and should be made a part of the team. We suggest that local leaders schedule periodic discussion periods and operating exercises through the year and get the help of clubs in advancing know-how and in recruiting active amateurs. By critiques of the operations and classes to advance methods and procedures, strides in accuracy and speed of handling record communications are possible. All this helps each individual make of himself one of the more accomplished rather than merely casual operators in amateur circles.

Results of this test (the SET) are a barometer scanned each year indicating the over-all ability of amateurs to serve in emergencies. This test therefore calls for every active licensee to register with his EC or SEC . . . participating in every disaster and exercise as his circumstances permit. So be ready for this test, whatever form your local SET takes, on or about October 8th-9th. You as an individual, and your community, and the whole body of amateurs can thus demonstrate as fully as possible our communications readiness for either c.d. or natural disaster operations.

**Amateurs Again Serve in Flood Emergency; Report Your Part.** Once again scores of amateurs in and about the stricken communities of several states have risen to support the tradition of the amateur service for providing stand-by radio communications. We have reason to be proud of the radio work chalked up by amateurs which began following the unprecedented deluge delivered by dying hurricane Diane. As we write after five strenuous days, operations are still in progress from Pennsylvania to Massachusetts with radio taking only high priority traffic for those points in the Naugatuck valley (Conn.) areas where very limited wire service has been restored.

Since WIAW itself was engaged each day we had to suspend the code practice periods during the peak of this effort; we hope all parties will understand. The National Emergency Coördinator found himself in Pennsylvania, also hard hit by the storm. No few words can adequately record the operating events that have transpired over such a wide area in such a short space of time. But the NEC will start work on the story on return, when the radio work itself is completed and your reports are in hand. We want to call on each and every amateur participant to report his work, whether as part of an organized AREC or RACES facility, for governmental units or Red Cross or individuals —

so *QST* may accurately record the whole effort, and attempt to credit what (and how) we did. Be sure to include any pictures. Thanks. We'll have more to say on the emergency operating events next month.

**Additional FCC Suspensions.** Latest FCC actions enforcing indicated amateur service regulations are now reported. See page 70 of March '55 *QST* and page 68 of July '55 *QST* for suspensions covering other types of violations.

FCC ordered (August 10, 1955) that the amateur operator license of Ronald F. Ridenour, Denver, Colo., be suspended for ninety days, that the license be turned in to the FCC, and W6CNK not be permitted to be operated by any person in the 90-day period, *it appearing that the licensee* on various occasions during the period from September 1952 to June 1955 and particularly on June 4, 1955, violated Sections 12.91 and 12.93 of FCC rules by engaging in the operation of his station after changing residence from Fort Dodge, Iowa, to Denver, Colo., without first notifying the Commission's Field Office, Denver, of his intended portable operation, and continued such radio operation for a period exceeding four months without having his amateur radio licenses modified to provide for his change of residence, and *it further appearing*, that said licensee in this period failed to maintain an accurate radio station log and have same available for inspection by a representative of FCC, in violation of Sec. 12.136 and 12.137 of FCC rules.

FCC ordered (August 17, 1955) that the amateur operator license of Jack A. Gardiner, Havre, Mont., be suspended for sixty days, that the license be turned in to FCC, and W7DZF not be permitted to be operated by any person in the sixty-day period, *it appearing that the licensee* on March 13, 1955, operated on 14.197.9 and 14.198.1 kc., using A-3 emission in violation of Section 12.111 of FCC rules; also that he failed to respond to FCC violation notices pertaining to the alleged improper operation which is a violation of Sec. 12.155 of FCC rules.

**Stuttered Speech for Clearness?** "In the course of a study of voice communication that is being made at Ohio State University. . . . It was found that a radiotelephone conversation is much clearer if the speakers seem to stutter, that is, if they say 'wuh-one, tuh-two' instead of the usual 'one, two.' This method of saying 'wuh-one, tuh-two' is known as the 'bounce block' stutter. . . ." Quote is from the *New York Times*. K2FG wonders if this could lead to 'phone operator use of such expressions as "Bounce the blocks, Boy [i.e., please stutter], QRM is tough" or "Gimme that ole double stutter, friend. The block is bouncing." A few years of this and the only way the XYL can get through the OM's mental haze will be, "Nuh-now, duh-dear, Uh-about thuh-that nuh-new huh-hat." With tough going we'll have to stutter our way through. Speaking of intelligibility, the psychoacoustic laboratory at Harvard completed several outstanding studies during the last world war. Their conclusions — indicating that in any phonetic alphabet, the *more* syllables that can be used emphasizing a given character, the *better* the intelligibility — agree firmly with the above principle.

— F. E. H.

## DXCC NOTES

We should like to call attention to two matters concerning DXCC. A number of DXCC applicants, both for initial applications and endorsements, are neglecting to comply with rule 4 of the DXCC Rules (copy upon request). Rule 4 specifically states that a list must be sent in with all such

applications. Such a list helps keep track of your card mailings, assists in rechecking at future times and aids us in speeding service to all the DXCC gang. Your cooperation in complying with such rules will be appreciated.

At this time we'd like to make mention of a relatively new U. S. Mail service known as certified mail. As far as safe mail delivery is concerned, this new service does exactly the same thing as registered mail, but at less than half the cost of registered mail. Incidentally, registered-mail fees have gone up to 40 cents for North and South America and 55 cents for all other parts of the World (4 and 5 IRCs respectively). Regrettably, the certified mail service is applicable only in the U. S. and possessions.

## DX CENTURY CLUB AWARDS

### HONOR ROLL

W1FH. . . . .260	W8NBF. . . . .250	W3KT. . . . .247
W6AM. . . . .254	W0YXO. . . . .250	W6MX. . . . .247
W6VFR. . . . .254	W3GHD. . . . .249	W5MIS. . . . .246
W3BES. . . . .251	W6SN. . . . .249	W6MEK. . . . .246
W6ENV. . . . .251	W2AGW. . . . .248	W9NDA. . . . .246
W5HGW. . . . .251	W3JTC. . . . .248	W8BRA. . . . .245
PY2CK. . . . .251	G2PL. . . . .248	W7AMX. . . . .244
W6SYG. . . . .250	W2BXA. . . . .247	G6ZO. . . . .244

### Radiotelephone

PY2CK. . . . .243	W1JXC. . . . .219	XE1AC. . . . .215
W1FH. . . . .233	W1MCW. . . . .219	W5HGW. . . . .214
VQ4ERR. . . . .231	W1NWO. . . . .217	W9NDA. . . . .213
ZS6BW. . . . .227	W3JNN. . . . .215	W5BGP. . . . .211

From July 15, to August 15, 1955 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

### NEW MEMBERS

W31MV. . . . .183	W3WUH. . . . .108	W0QGI. . . . .102
G5LP. . . . .146	ZL1LZ. . . . .108	J46AD. . . . .101
PA0SPR. . . . .129	W1ORP. . . . .107	W3RFA. . . . .101
W1KQF. . . . .116	W2STJ. . . . .106	H9PMX. . . . .101
ET3S. . . . .116	W4JBQ. . . . .106	KP4WD. . . . .101
W2CKY. . . . .115	W4EBO. . . . .105	W3CPB. . . . .100
DL6MK. . . . .115	VE3IG. . . . .105	W3SOH. . . . .100
W3VRJ. . . . .111	DL1BZ. . . . .103	DL3XS. . . . .100
DL4CZ. . . . .111	HB9QO. . . . .103	G5LGI. . . . .100
W2AOK. . . . .108	4X4DN. . . . .103	ZS6SG. . . . .100

### Radiotelephone

W31MV. . . . .163	PY4LP. . . . .109	W1QWU. . . . .101
W6QLH. . . . .137	W2BQM. . . . .106	YK1AA. . . . .101
11BDB. . . . .115	H5GA. . . . .104	W3RYM. . . . .100
W2CKY. . . . .111	DL4JZ. . . . .103	C3SAF. . . . .100
W9JYU. . . . .111	EA7EM. . . . .103	C2CNC. . . . .100
	VS2DQ. . . . .102	

### ENDORSEMENTS

W6TT. . . . .243	W0ERI. . . . .163	DL3RK. . . . .140
W2WZ. . . . .241	W8TMA. . . . .161	W3LXE. . . . .135
W6VE. . . . .230	W4ZD. . . . .160	C73AN. . . . .132
W4TM. . . . .223	W9FDX. . . . .160	W1JDE. . . . .130
W7HX. . . . .222	W50LG. . . . .158	W0WJG. . . . .129
ZS6DW. . . . .222	W9QLH. . . . .158	W4THZ. . . . .129
W0A1W. . . . .221	W9AMU. . . . .153	W5HDS. . . . .130
SM5KP. . . . .220	W0AXF. . . . .151	W5HMI. . . . .130
W5BGP. . . . .212	G3EMD. . . . .151	W6ONS. . . . .121
W1HA. . . . .210	W1VIG. . . . .150	W2CR. . . . .120
W2CNT. . . . .200	W5KBU. . . . .147	W4IDP. . . . .120
W6PGB. . . . .200	W8EV. . . . .144	W5TUK. . . . .120
CN8MM. . . . .200	W9VP. . . . .144	W5OGV. . . . .120
W6RWE. . . . .192	OZ3Y. . . . .143	W3WDC. . . . .119
W6LDD. . . . .190	K2BZT. . . . .142	W0YZO. . . . .119
W2MLO. . . . .181	DL1YA. . . . .142	W5PCS. . . . .114
W6WQ. . . . .172	W5TX. . . . .140	W2N1Y. . . . .110
OZ3FL. . . . .171	DL1BO. . . . .140	W20XR. . . . .110
W4VE. . . . .169		W4PVD. . . . .110

### Radiotelephone

ZS6DW. . . . .200	W8BKP. . . . .160	ZS3G. . . . .123
ZL2GX. . . . .190	W8QJR. . . . .150	W4VNE. . . . .121
G3HLS. . . . .190	W0GKL. . . . .148	W4EEE. . . . .120
W5KML. . . . .170	W5KBU. . . . .140	W9WHM. . . . .112
C02BL. . . . .170	W9FDX. . . . .138	K2CJN. . . . .113
LU4DMG. . . . .170	W4NHF. . . . .130	W2JIL. . . . .110
HB9J. . . . .162	LA5YE. . . . .130	W6SYG. . . . .110

### W/VE/VO Call Area and Continental Leaders

W4BPD. . . . .241	VE5QZ. . . . .140	V06EP. . . . .190
VE1HG. . . . .150	VE6GD. . . . .108	4X4RE. . . . .210
VE2WW. . . . .181	VE7HC. . . . .209	ZS6BW. . . . .234
VE3QD. . . . .210	VE5AW. . . . .160	ZL2GX. . . . .240

### Radiotelephone

W2APU. . . . .202	W7HIA. . . . .181	VE3KF. . . . .163
W2BXA. . . . .202	W0A1W. . . . .191	VE7DM. . . . .140
W4HA. . . . .184	VE1CR. . . . .129	V0ZAB. . . . .170
W6AM. . . . .206	VE2WW. . . . .102	SM5EP. . . . .210
W6DI. . . . .206		ZL1HY. . . . .196



In most AREC organizations, the EC has enough to do in just organizing and promoting. Yet, we here at ARRL are constantly hounding him to report: report this, report that, give us figures on the other thing, and so on. Along with this, we say we'd rather have an EC who does things but reports nothing than one who does nothing and reports just that.

The value of statistical reports is tremendous, and yet it's a big chore for the ECs to compile and submit them — especially for some ECs who are super-active when it comes to operations but not the slightest interested in statistics. We've done some thinking about this and would like to make a suggestion.

How about an AREC reporter? Our organizational standards provide for Assistant ECs to take on specialized departments of the work, especially in large organizations. Why not designate one of your members who is statistically inclined, or handy with the pen, as Assistant EC in charge of reports and publicity? It could be a big job, and a most important one. He would need to know what's going on in the AREC organization, how RACES is progressing locally; he would want statistics on all sub-groups; he would need contact with local newspapers, radio and TV stations to give the group's efforts publicity; and his would be the job of writing up regular EC reports for the EC's signature to go to the SEC or headquarters and any writing or reporting to be done for QST or other publications.

An Assistant EC serving as "AREC Reporter" would be most valuable in the larger organizations, of course — such as those in large cities. There, unlike the small community, the EC cannot do all the work. He has to delegate a lot of functions and be pretty much an overseer of work being done rather than the one who does the work. To an active amateur, overseeing is a harder job than doing the work himself; that's why many of our ECs are overworked and quickly burn themselves out. An AREC statistician or general reporter could do much to take some of the hated statistical and reporting burden off his shoulders. Has anyone tried this?

Supplementary "Operation Alert" reports:

In Omaha, two separate operations were conducted. One was to provide communication between c.d. Medical and 18 first aid stations. The other was to provide communications between county and state civil defense headquarters. The former was done on ten meters, with mobiles reporting in from first aid stations. The latter was done on 75, and a relay established between county c.d. headquarters and 2-meter control. Thirteen mobiles were operated and 18 other amateurs participated.

Here is the Mobile Squad of Civil Defense, Saline County, Salina, Kans. Most of them are members of the Central Kansas Radio Club. All members of the mobile squad are police commissioned and carry out their duties with the full support of the police. A great deal of commendable work has been done in this manner.



WSHZA reports that the West Virginia Net (WVN) in cooperation with the West Virginia Phone Net was active in "Operation alert" from 1600 to 2230 on June 15th. Ten meter links maintained contact between state c.d. headquarters (WSQHIG), the 'phone message center (WSCLX) and the c.w. message center (WSHZA/8).

Oregon SEC W7WAT reports participation in his section. In Portland, W7VS operated from c.d. headquarters under the direction of W7KY on 3995 kc. In Medford, participation was on a limited basis by members of the Rogue Valley Amateur Radio Club, including W7s HLF (RO) QMK ULR OFS and LYR.

On April 25th the Red Cross alerted the AREC in Hamilton, Ont., to render service in connection with a flood and high waves in the Crescent Beach area of Lake Ontario. Two mobiles were put into action at the Beach, and the Red Cross official was transported to the beach. Four mobiles and a control station saw action in this emergency.

— VESKM, SEC Ontario

On July 23rd a soldier drowned near Great Falls, Mont., in the Missouri River. Amateurs from Great Falls were called upon to assist in rendering communications between the scene and the Great Falls Army Air Base. W7PCZ/m operated at the scene while W7TSG and W7KUH handled other necessary communications contacts.

— W7KUH, SEC Montana

W7OKM was able to perform an emergency service on the "Seven Devils Road" (U. S. Route 101) between Coos Bay and Bandon, Ore., on July 31. Spotting a car off the road on the brush on one of the many bad turns in the road, he stopped his car and investigated. The stalled vehicle was from British Columbia and was teetering perilously on the edge of a canyon, occupants still inside and afraid to move. While W7OKM contrived to steady the teetering car, the British Columbia couple climbed out safely. Then he contacted W7VPF from his car and had him summon a tow car, which arrived 45 minutes later and pulled the endangered automobile to safety. — W7QKU, PAM Oregon.

We want to enter herewith a few words of praise for the Alabama Section emergency organization. There has just recently come to our desk an eighteen-page manual of "Instructions for Members of AEN CW and Phone Nets," issued and approved jointly by the Section RM (W4KIX), the Section PAM (W4WOG), the SEC (W4TKL) and the SCM (W4MI). Although the cover realistically states that the manual covers only the "barest essentials," it is one of the most complete and comprehensive section net operating manuals and directives we have seen. Other sections might well take a cue from Alabama on their fine net organization.

Fifteen SECs reported June activities, representing 5195 AREC members. Two reports did not include figures on AREC membership. Reporting sections: Minn., Wash., Tenn., West N. Y., NYC-LI, Georgia, Kentucky, San Joaquin Valley, Louisiana, Wis., Colo., S. Dak., Los Angeles,

The Western Illinois Radio Club of Quincy purchased this bus and turned it over to the city of Quincy to be made into a communications control center. The city purchased some equipment for it, and club members did most of the work installing it. It is intended primarily for civil defense use and contains several transmitters and receivers, a gas-driven generator and a public address system.



Mont., Ore. This June's results exceed those of June a year ago and two years ago, both in number of reports and number of AREC members represented. The mid-year record thus shows a gratifying, if not considerable, increase over that of last year. For example, at mid-year 1954 we had reports from 21 different sections; this year we have 26 different ones. At mid-year 1954 we had a total of 77 reports on file; this year we have 98. The record even compares favorably with our good 1953 record, but does not yet exceed it in all particulars. It would be easy to do so if more of you SECs would drop us a report on Form 8 each month.

The following sections have a 100% reporting record so far this year: Minnesota, Western N. Y., NYC-LI, San Joaquin Valley, Wisconsin, South Dakota. These have missed only one report: Washington, Tennessee, Georgia, Eastern Florida, Los Angeles, Oregon.

### RACES News

We have just received from FCDA a comprehensive listing of states and local areas now operating under RACES plans. Although it will take up quite a lot of room, we think it is worth reproducing here. The following states are now operating under state RACES plans: Alabama, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Tennessee, Vermont, Virginia, Washington, West Virginia, Wisconsin. That makes 34 states under RACES, leaving 14 who have not yet submitted RACES plans; however, of these 14, six have local RACES authorizations operating within them. Alaska, District of Columbia and Hawaii are also RACES authorized under an approved plan.



Following are the local RACES plans now in operation: **Alabama:** Jefferson Co.

**California:** Napa Co., Marin Co., San Luis Obispo, Yolo, Santa Maria, Sacramento Co., San Francisco, San Mateo Co., Contra Costa, Santa Barbara, Sonoma Co., San Diego.

**Colorado:** La Junta, Alamosa, Denver, Grand Junction, Colorado Springs, Fremont Co., Pueblo Co., Boulder, Adams Co.

**Connecticut:** New London, Portland, Naugatuck, Ansonia, Hamden, Bridgeport, Coventry, Middletown, New Britain, New Haven, Norwalk, Shelton, Waterbury, Watertown, Wethersfield, Southington, Redding, West Hartford, Plainville, Easton, Enfield, Glastonbury, Greenwich, Groton, Madison, Manchester, Mansfield, Milford, Monroe, New Canaan, Stafford, Stonington, Stratford, Torrington, Trumbull, Waterford, Windsor, Woodbridge, Bristol, Chaplin, Darien, Fairfield Co., Hartford Co., Norwich, Stamford, Willimantic/Windham.

**Florida:** Brevard Co. (Pending), Dade Co., Halifax, Hillsborough Co., Leon Co., Manatee Co., Orange Co., Pensacola, Pinellas Co., Sarasota, Lake Co.

**Illinois:** Chicago, Decatur, Des Plaines, Joliet, LaGrange Park, Lake Co., Du Page Co.

**Indiana:** Vanderburgh Co., Marion Co., St. Joseph Co., Wayne Co., Hammond.

**Iowa:** Cedar Rapids.

**Kansas:** Olathe, Scott Co., Kingman Co., Topeka/Shawnee Area, Pittsburg, Kansas City/Wyandotte Co., Halstead, Wichita/Sedgwick Co., Marysville, Clay Co.

**Maine:** Augusta, Bangor, Arrostook Co., Androscoggin Co., Oxford Co.

**Maryland:** Baltimore, Harford Co., Cecil Co., Prince George Co. (Pending), Montgomery, Anne Arundel.

**Massachusetts:** Abington, Acton, Arlington, Belmont, Beverly, Boston, Brookline, Cambridge (Pending), Chicopee, Danvers, Dedham, Dover, Easton, Fairhaven, Haverhill, Holyoke, Leominster, Lexington, Malden, Needham, New Bedford, Newburyport, Newton, Norfolk, Norton, Norwell, Petersham, Scituate, Wakefield, Waltham, Watertown, Wellesley, Westfield, Worcester.

**Minnesota:** Duluth, Minneapolis, St. Paul.

**Mississippi:** Jackson.

**Missouri:** Independence, Springfield, St. Joseph.

**New Hampshire:** Portsmouth.

**New Jersey State:** State Area 1, Bergen & Passaic Co.; State Area 2, Hudson Co.; State Area 3, Essex Co.; State Area 4, Union City; State Area 5, Sussex and Morris; State Area 6, Warren, Hunterdon & Somerset; State Area 7, Middlesex; State Area 8, Mercer; State Area 9, Monmouth & Areas; Burlington; Camden & Gloucester; Atlantic & Cape May; Salem & Cumberland.

**New Mexico:** Albuquerque.

**New York:** Albany Co., Allegany Co., Broome Co., Cayuga Co., Chemung Co., Clinton Co., Columbia Co., Cortland Co., Delaware Co., Dutchess Co., Erie Co., Franklin Co., Greene Co., Herkimer Co., Ithaca, Jamestown, Jefferson Co., Lewis Co., Livingston Co., Madison Co., Monroe Co., Montgomery Co., Mount Vernon, Nassau Co., New Rochelle, New York, Niagara Co., Niagara Falls, Ogdensburg, Olean, Oneida Co., Onondaga Co., Orange Co., Orleans Co., Oswego Co., Otsego Co., Peekskill, Port Jervis, Putnam Co., Rome, Rensselaer (city), Rensselaer (county), Rockland Co., Rye, Saratoga Co., Schenectady Co., Schoharie Co., Seneca Co., Steuben Co., Suffolk Co., Sullivan Co., Tompkins Co., Ulster Co., Utica, Warren Co., Washington Co., Wayne Co., Westchester Co., White Plains, Yates Co.

**Ohio:** Barberton, Canton, Cleveland, Jefferson Co., Lucas Co., Montgomery Co., Columbus, Ross Co., Van Wert, Youngstown.

**Oklahoma:** Tulsa.

**Oregon:** Baker Co., Benton Co., Deschutes, Jackson Co., Josephine Co., Lane Co., Linn Co., Marion Co., Portland, Umatilla Co., Washington Co., Yamhill Co.

**Pennsylvania:** Butler Co., Centre Co., Cumberland, Delaware Co., Philadelphia.

**Rhode Island:** Bristol, Coventry, Cranston, Portsmouth, Warren.

**Tennessee:** Chattanooga, Knoxville, Memphis, Nashville, Weakley.

**Texas:** Dallas Co., Fort Worth, Galveston Co., Houston, Paris, Wichita Falls.

**Utah:** Provo City, Salt Lake City, Utah Co.

**Virginia:** Hampton, London Co., Norfolk, Northern Region, Richmond, Roanoke.

**Washington:** Chelan Co., Clallam Co., Clark Co., Cowitz Co., Douglas Co., Franklin Co., Garfield Co., Grant Co., Grays Harbor, King Co., Kitsap Co., Okanogan Co., Pacific Co., Pierce Co., Seattle, Snohomish Co., Spokane Co., Tacoma, Thurston Co., Yakima Co.

**Wisconsin:** Madison, Milwaukee.

Let us know of any inaccuracies in the above lists, so they can be corrected on both our and FCDA's listings.

*Ready for the Simulated Emergency Test, October 8th-9th? See announcement elsewhere in this issue.*



## PREVIEW — 1955 FIELD DAY

Shown below are high claimed scores reported for the Nineteenth ARRL Field Day, held the week end of June 25th and 26th. These are subject to checking and grouping according to the number of transmitters in simultaneous use at each station. Complete FD results will appear in a later issue of QST.

### CLASS A — Portable Clubs and Groups

(Listings show call used in FD, claimed score, and number of simultaneously-operated transmitters.)

K6BAG/6	20,220-9	W9ZKW/9	5550-3
W2LJ/2	18,135-10	W4TRC/4	5542-4
W4FC/8	18,009-10	W2DAY/2	5542-4
W9IT/9	15,723-10	W2MO/6	5456-3
W9AP/9	15,255-9	W9FLP/9	5301-7
W6UH/6	13,983-10	W7HZ/7	5301-3
W1OC/1	13,905-9	W2QV/2	5275-3
W6HS/6	13,743-9	W4MK/4	5247-1
W6CG/6	12,816-5	W2BVL/2	5223-5
W9PCS/9	12,663-5	W6TTN/6	5202-4
W6DTC/6	12,123-11	W0YDN/0	5184-1
K0CKP/0	11,187-13	W3AFM/3	5162-4
W8KPB/8	11,169-6	W9TCB/9	5143-3
W2VDJ/2	11,160-6	K5FGJ/5	5094-2
W6TOI/6	11,111-11	W6MHM/6	4977-4
K6EBN/6	10,800-7	W3PIQ/3	4962-5
W3RCN/3	10,764-9	K6LTA/6	4941-5
W6OTX/6	10,233-7	K6FR/6	4905-7
K2AA/2	10,233-4	W5DND/5	4887-3
VE3JL/3	9846-8	W9TCB/9	4873-3
W8SW/9	9648-6	W7VTO/7	4815-4
VE3BRR/3	9468-9	W1GLA/1	4815-6
W5SC/5	9414-10	W3DYL/3	4806-1
W2ARL/2	8874-3	W9NUW/9	4797-2
W9SWQ/9	8685-5	W2ZRC/2	4770-2
W6ICJ/6	8658-4	W3DQ/3	4710-3
W8PM/8	8649-3	W2JDP/2	4698-2
W6PD/6	8040-4	W6HUB/6	4689-3
W9OBB/9	7848-6	W9UDU/9	4653-2
VE3DC/3	7737-10	VE3YJ/3	4650-3
VE3ZM/3	7605-7	W4MOF/4	4644-5
W2OR/2	7416-3	W6HRM/9	4628-2
W6BHP/6	7170-7	W5DC/5	4530-4
W9OFR/9	7056-4	W2OW/2	4461-3
K2BC/2	7038-4	W0ERG/0	4458-4
W8MRM/8	6808-4	W4DU/4	4458-4
W3CLC/3	6804-2	K6CLZ/6	4441-3
W8SKT/8	6735-3	W5CEA/8	4441-3
W9KVK/9	6729-3	K5FD/3	419-7
W3VRZ/3	6717-4	W5NW/5	4368-3
W3OK/3	6687-4	W5CF/5	4356-4
W9AB/9	6570-3	K6CTO/6	4329-3
W8RUM/8	6498-4	W1ICP/1	4320-1
W6IFW/6	6381-3	W5MPZ/5	4302-3
W2YKQ/2	6363-5	W4PAY/4	4287-4
W9BA/9	6300-5	W2ALR/2	4278-3
W7DK/7	6246-6	W4FR/4	4275-3
W2KOJ/2	6228-4	W4SKH/4	4269-3
W9ERU/9	6156-4	W8MAA/8	4267-3
K6CEF/6	6084-6	W8RNF/8	4260-4
W6M1/6	6075-2	W5NB/1	4257-2
W1WKN/1	6030-7	W3FF/3	4251-4
W6NWG/6	6003-4	W6DVU/6	4203-6
K2CBR/2	6003-3	W1OP/1	4194-2
W1EIA/1	5994-1	W6VVK/6	4176-3
W5PDO/5	5982-4	W9KA/9	4167-3
K2LJM/2	5899-2	W8FPW/8	4148-4
K6CXI/6	5882-4	W8JH/8	4125-4
W2OW/2	5820-2	W9WFJ/9	4105-5
W3NKF/8	5733-6	W1NEM/1	4095-6
W4PLB/4	5727-3	W8PLQ/8	4074-1
W6LUC/6	5706-5	W8FO/8	4038-6
K2LSA/2	5697-3	W9DUP/9	4023-3
W3GRX/3	5622-3	W0RFU/0	4017-2
W5ACW/8	5604-5	W2MUM/2	4005-2
W2GTD/2	5589-3	W4TL/4	4005-3
W3CWC/3	5553-2		

### CLASS B — One- and Two-Man Portables

(Listings show call and score.)

W3EIS/3	6993	W6MUR/6	2547
W5VRP/5	5751	W6RSU/6	2496
W2FBA/2	5319	W8VWY/8	2444
K5BLL/5	4995	W5PIZ/5	2304
W9ESQ/9	2979	W8NKI/8	2160
W6DSF/9	2778	W7CMQ/7	2106
W9AJA/9	2592	K6DQA/6	2058

### CLASS C — Mobiles

W8HFE/8	4914	W8BDZ/8	2255
W8QAV/8	4374	W8KCD/8	2254
W4YL/4	3821	W8WAG/8	2241
W8ERA/8	3740	W8NCG/8	2201
W8FKB/8	2929	W8NNO/8	2201
W8SRH/8	2916	W8NZC/8	2201
W8GHO/8	2903	W8RAK/8	2201
W8AJH/8	2862	W8VM/8	2201
W8AEU/8	2511	W8LHJ/8	2200
W8GMK/8	2511	W8HJ/8	2187
W8INO/8	2417	W8OJU/8	2174
W8PM/8	2363	W8FTD/8	2160
W8MWE/8	2336	W8OKI/8	2129
W8WZ8/8	2336	W8MAE/8	2120
W8INW/8	2268		

## CLASS D — Home Stations, Emergency Power

K4CDA	361	W7YRV	178
K6AAJ	267	W3LSS	61

## CLASS E — Home Stations, Commercial Power

W3QOQ	463	W3ISE	149
W4YZC	296	W9WAN	145
W6MSO	247	W2DRV	142
K2IDM	232	K2IVN	139
W9EXL	177	W9HBP	102

## BRASS POUNDERS LEAGUE

Winners of BPL Certificates for July traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3WG	7	692	676	8	1383
W9NZD	362	488	3	481	1334
W9DO	26	616	567	74	1283
W8SCA	20	535	544	4	1103
W3CUL	62	496	399	91	1048
W7BA	22	467	444	21	954
W0CP1	12	427	394	33	866
W0PZO	1	432	420	3	856
W7PGY	31	404	341	63	839
W3W1Q	6	338	341	12	697
W4PFC	11	339	320	15	685
W1AAR	33	309	261	34	637
W0BDR	6	281	254	2	543
W3WV	35	264	160	49	508

Rate Reports:

W4LEV (June)	24	26	371	373	794
W0KQZ (Apr.)	73	365	318	9	765
K9AND (Apr.)	12	362	332	6	712

### More-Than-One-Operator Stations

KH6AJF	66	1077	989	75	2207
W6IAB	33	1071	1022	49	2175
W6NY	35	561	483	82	1161
K0WBB	39	288	276	36	639
W9OFR/9	633	0	0	0	633
K5FFB	37	276	290	17	620

Rate Reports:

KH6AJF (June)	291	1087	978	103	2459
K0WBB (May)	53	474	440	30	997
K0WBB (Apr.)	36	350	307	35	728
K0WBB (Mar.)	40	337	277	41	695

BPL for 100 or more originations-plus deliveries:

K4ASU	224	W0TQA	108	W0TVI (Apr.)	116
W6GYH	119	W0RLQ	107	W4UHA (June)	116
W1DYE	118	Rate Reports:		W9NVU (May)	112
KF4WT	114	W0LO/0 (May)	302	W4ZBA (June)	105

### More-Than-One-Operator Stations

W3UCR	152	KH6QU	119	Rate Report:	
		K3WBJ (June)	101		

BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: K4AKP, W4DDY, K4WBG, W5DTA/5, W5KPB, W9YWL.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies, within 48 hours of receipt, in standard ARRL form.

## TRAFFIC TOPICS

It is entirely inevitable that we continue to regard traffic activity on the amateur bands in terms of "seasons" rather than calendar years. Not only is this a result of habit, because we've always done it that way and years ago nearly all traffic activity was suspended in May until October, but also of the necessity of taking into account the fact that most traffic men handle traffic because they enjoy it — and they don't enjoy it in the summer, with heat, insects, QRN and diversions occasioned by vacations and other invitations to the great out-of-doors.

Since the advent of NTS, however, and the tendency in other traffic circles as well to keep the traffic moving all year around, the aspect of "seasons" of traffic handling has been less noticeable. Oh, activity still drops off in summertime, and network organization goes all the way to when people start legal clock-changing, but you'll notice that the BPL is far larger by comparison during the summer months than it used to be, say, in 1936. For example, in December of 1935 we had 109 BPLs, but the following August only nine — this, mind you, during the lush traffic years when traffic handling was described (by Clinton B. DeSoto) as the "major activity" in amateur radio. Compare this with the BPL total of 114 in December of 1953 and 85 in August of 1954. Our summertime traffic activity, these days, is equal to some of the lower-yielding winter traffic months.

This is as it should be. If we are going to have a functioning traffic organization, it should function all year around. If training is one of the most important objectives in our traffic work (and we think it is), training in handling traffic under unfavorable conditions is one of the best kinds, if not the best kind. Why? Because most training is conducted under favorable conditions, causing almost complete breakdown when the trainee is faced with difficulties.

We have no quarrel with "fair weather" traffic men. In fact, we're mighty glad to have them working in the system during the good radio months. All we're saying is that the boys who stick with it all summer are getting the greatest benefit and doing the greatest good. And now that the fall operating season is on us again, let's make this the greatest traffic year yet.

**HAVE YOU REGISTERED YOUR NET?** If not, better do it if you want it in the annual Net Directory. Deadline for November QST listing was September 15; for January QST listing, November 15. For the cross-indexed net directory, December 1. See Traffic Topics in September QST for details on how to register.

Traffic nets will have a part to play in the Simulated Emergency Test, October 8th-9th. This is an ideal activity with which to pry the lid off the so-called fall operating season. See complete announcement elsewhere in this issue of QST.

The First Call Area Section of the Transcontinental Phone Net registered 614 message counts with 14 stations participating in July. During June, the message total was 400 by 8 stations. The Second Call Area Section reports 608 messages by 12 stations in July, 786 messages by 12 stations in June. This info by WLYL.

**National Traffic System.** As of this writing, the Eastern Area Net of NTS can handle traffic addressed to APO New York City. This is handled by a corps of stations organized by W2JOA who report into EAN for that purpose each night. The traffic is handled via MARS circuits, not by amateur radio. Stations participating are W2JOA, K2JEB, K2AEQ and W3WG. If you have traffic for APO New York, it can be routed to EAN through normal NTS channels.

Traffic for APO San Francisco (or other Pacific points) is an assignment of the Sixth Regional Net and should be routed through PAN to RN6. APO Seattle is similarly handled by RN7.

Of course we can't guarantee that these routings won't be changed by the time you read this!

July reports:

Net	Sections	Traffic	Rate	Average	Representation
EAN	19	508	1.16	26.7	—
PAN	27	431	0.15	15.9	100%
1RN	26	251	0.30	9.6	76%
3RN	33	94	0.40	2.8	88%
RN5	30	325	0.46	10.8	55%
RN6	24	129	0.36	5.4	—
RN7	40	95	—	2.3	29%
SRN	38	110	—	3.2	70%
9RN	23	430	0.61	18.7	89%
TEN	66	1059	—	16.0	59%
TRN	16	21	—	1.3	52%
TCC (Pacific)		240			
TCC (Eastern)		85			
Sections *	322	1519			

Summary	664	5297	EAN	7.5	PAN
Record	664	6145	1.16	15.2	100%

\* Section Nets reporting: KYN (Ky.); WSN (Wash.); WVN (W. Va.); Hi Noon (Colo.); SCN (Calif.); NTX (N. Tex.); AENB & AENP (Ala.); GSN (Ga.); QKS, QKS-SS & QKN (Kans.); Tenn. CW & Tenn. Summer; CVN (San Joaquin Valley, Calif.).

Late Reports:

CAN (Apr.)	20	690	—	34.5	95%
CAN (May)	22	1095	0.67	49.7	97%
CAN (June)	22	650	—	29.5	95%
TCC Central (Apr.)		172			
TCC Central (May)		685			
TCC Central (June)		384			
WVN (June)	13	79			

It appears that one of the hardest things for net managers to do is get their reports in here on time. This isn't always their fault, after all, they have to get QNS reports from NCS before they can make out a report, simple as it is after that. So this is a plea to NTS Net Control Stations at all levels: *report to your net manager promptly* after you control a net session, whether you are the regular control or not. Failure to do so results in a delayed report (which may then miss its proper issue of QST), or an incomplete report which prevents us from indicating the true status of NTS. NCS: *report to net manager promptly! Net Managers: Get reports into headquarters not later than the fifteenth of each month!*

Despite the "summer slump," only two regional nets and one area net failed to report, and fifteen section-level nets reported. Traffic is low, but organizational morale is high. RN5 reports a sharp decrease in traffic with cessation of traffic from MARS sources; K4AKP has been most consistent station during July. RN6 certificates have been awarded to K6GID, W6TTX, and K6EVM. July RN7 representation has been nil from Wyoming, Montana, Saskatchewan, Alberta and Alaska. W4KKW submits his first report as 9RN manager. W0KLG submitted the July TEN report for W0DQL. VE3GI reports that Maritime representation is badly needed on TRN.

In TCC, W0KQD will take over the TCC Pacific Area directorship being vacated by W6HC at the end of September. W9JUL will continue with the Central Area directorship and W8UPB with Eastern Area. The present roster, according to latest info from TCC directors: *Eastern Area:* W1EMG W1AW W1NJM W3COK W4OCG W4ZFW W8DSX W8FYO W8MQQ VE3AJR VE3BJV VE3GI VE3TM VE3VZ, *Central Area:* W0BDR and W8SCA; *Pacific Area:* W6ADB W6IPW K6BDF/7, W7CCL W7KZ K8ANZ/6 K0WBB W0KQD.

## W1AW OPERATING NOTE

The W1AW operating schedule, as shown on page 70, May QST, and page 70, September QST, will be maintained through October 29th. The W1AW fall schedule, effective Oct. 30th with return to EST, will be in November QST.

## ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

San Joaquin Valley	Ralph Saroyan, W6JPU	June 15, 1955
West Virginia	Albert H. Hix, W8PQQ	Sept. 18, 1955
San Diego	Don Stansifer, W6LRU	Oct. 15, 1955
Vermont	Robert L. Scott, W1RNA	Oct. 15, 1955

In the Wyoming Section of the Rocky Mountain Division, Mr. Wallace J. Ritter, W7PKX, and Mr. Oscar Younglund, W7NVX, were nominated. Mr. Ritter received 46 votes and Mr. Younglund received 25 votes. Mr. Ritter's term of office began July 11, 1955.

In the Eastern Florida Section of the Southeastern Division, Mr. Arthur H. Benzee, W4FE, and Mr. John W. Hollister, W4FWZ, were nominated. Mr. Benzee received 182 votes and Mr. Hollister received 178 votes. Mr. Benzee's term of office began Aug. 14, 1955.

In the Southern New Jersey Section of the Atlantic Division Mr. Herbert C. Brooks, K2BG, and Mr. Edward G. Raser, W2ZI, were nominated. Mr. Brooks, received 151 votes and Mr. Raser received 105 votes. Mr. Brooks' term of office began Aug. 26, 1955.

## A.R.R.L. ACTIVITIES CALENDAR

Oct. 7th: CP Qualifying Run — W6OWP  
Oct. 8th-9th: Simulated Emergency Test  
Oct. 13th: CP Qualifying Run — W1AW  
Oct. 15th-16th: CD QSO Party (c.w.)  
Oct. 22nd-23rd: CD QSO Party (phone)  
Nov. 5th: CP Qualifying Run — W6OWP  
Nov. 12th-13th, 19th-20th: Sweepstakes  
Nov. 18th: CP Qualifying Run — W1AW  
Dec. 2nd: CP Qualifying Run — W6OWP  
Dec. 12th: Qualifying Run — W1AW  
Jan. 7th: CP Qualifying Run — W6OWP  
Jan. 7th-8th: V.H.F. Sweepstakes  
Jan. 14th-15th: CD QSO Party (c.w.)  
Jan. 21st-22nd: CD QSO Party (phone)

## ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are required on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested: (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]  
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....  
.....ARRL Section of the.....  
Division, hereby nominate.....  
as candidate for Section Communications Manager for this Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— F. E. Handy, Communications Manager

Section	Closing Date	SCM	Present Term Ends
Yukon *	Oct. 14, 1955	W. R. Williamson	Mar. 17, 1949
West Indies	Oct. 14, 1955	William Werner	Aug. 15, 1952
Utah	Oct. 14, 1955	Floyd L. Hinshaw	Feb. 18, 1954
South Carolina	Oct. 14, 1955	T. Hunter Wood	Oct. 15, 1955
Western Florida	Oct. 14, 1955	Edward J. Collins	Oct. 15, 1955
East Bay	Oct. 14, 1955	Guy Black	Resigned
Eastern New York	Oct. 14, 1955	Stephen J. Neason	Dec. 14, 1955
Ohio	Oct. 14, 1955	John E. Siringer	Dec. 14, 1955
Alabama	Oct. 14, 1955	Joe A. Shannon	Dec. 14, 1955
Quebec *	Oct. 14, 1955	Gordon A. Lynn	Dec. 15, 1955
Illinois	Oct. 14, 1955	George T. Schreiber	Dec. 15, 1955
Alaska	Nov. 15, 1955	Dave A. Fulton	Jan. 15, 1956
Virginia	Dec. 15, 1955	John Carl Morgan	Feb. 11, 1956
Oklahoma	Dec. 15, 1955	Dr. Will G. Crandall	Feb. 15, 1956
Maritime *	Dec. 15, 1955	Douglas C. Johnson	Feb. 15, 1956
Georgia	Jan. 16, 1956	George W. Parker	Mar. 18, 1956

\*In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

## CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on October 13th at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,010, 52,000 and 145,600 kc. The next qualifying run from W6OWP only will be transmitted on October 7th at 2100 PDST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you

copyied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions will be made from W1AW each evening at 2130 EDST. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of QST text sometimes is reversed. To get sending practice, hook up your own key and buzzer and attempt to send in unison with W1AW.

Date	Subject of Practice Text from August QST
Oct. 4th:	An Improved Antenna Bridge, p. 11
Oct. 6th:	The Transistorized "Little Gem," p. 16
Oct. 10th:	807s in Parallel, p. 18
Oct. 12th:	One Tube — 80 and 40 Meters . . . , p. 26
Oct. 14th:	Portable Antennas for 50 and 144 Mc., p. 29
Oct. 18th:	The Automobile Storage Battery . . . , p. 32
Oct. 20th:	A Six-Meter Club Project, p. 37
Oct. 25th:	A.R.R.L. at Operation Cue, p. 45
Oct. 28th:	The World Above 60 Mc., p. 55

## JULY CD QSO PARTIES

Among the highlights in July: 00 W6MUR claims a record 68 sections worked on c.w. (all but VE4, VE5, VE6, KL7 and KZ5), and ORS W3DGM, a long-time brasspounder and contest enthusiast, took microphone in hand to pace the 'phone gang.

Listed below are the highest claimed scores. Figures after each call indicate score, number of contacts, and number of ARRL sections worked. Final and complete results will appear in the October CD Bulletin.

### C.W.

W6MUR.....	211,072-341-68	K2AFQ.....	65,750-251-50
W6BIP.....	157,080-287-60	W4UJ.....	64,900-213-59
W4KFC.....	136,335-440-61	W2DGW.....	64,435-263-49
W4YZC.....	126,700-412-60	W9FGX.....	60,760-242-49
W4PNK.....	124,500-415-60	K2HID/2.....	60,580-233-52
W1AW <sup>1</sup> .....	118,035-380-61	W3BIP.....	60,180-229-51
W1RAN/4.....	115,500-379-60	K6BWD.....	59,950-131-60
W3VOS.....	114,755-384-59	W3JNQ.....	59,160-232-51
W1WEF.....	110,865-382-67	K2EJU.....	59,020-227-62
W1TYQ.....	105,600-351-60	W1YNC.....	57,360-234-48
W1FEN/4.....	98,590-336-58	W6DW.....	56,930-207-55
W9NH.....	94,400-314-59	W3DGL.....	56,925-200-55
W2ZVW.....	89,375-318-55	W1AQE.....	54,880-224-49
W7VUI.....	88,485-190-51	W3UOE.....	53,750-246-43
W6UED.....	79,305-170-51	W5JDN.....	53,280-219-48
W9KLD.....	72,345-269-53	W5MIV.....	52,210-224-46
W3DVO.....	70,560-281-49	W5DAE.....	51,840-209-48
W2DWS.....	69,420-361-52	W1LYH.....	51,750-200-50
W4WQT.....	69,390-232-49	W5MQQ.....	51,500-201-60
W7GHT.....	67,206-159-46	W1UGW.....	51,465-214-47
W4SIE.....	66,780-252-53	W4VQZ.....	51,290-219-46
W6CRT.....	66,727-136-53	W2LRO.....	51,000-200-50
W1CRW.....	66,150-245-52	W6CHV.....	50,862-112-49
W7JLU.....	66,045-149-48	W2N1Y.....	50,830-215-46
W7YVW.....	66,080-240-54	VE7AC.....	50,204-124-44
W5SMV.....	65,780-253-62		

### 'PHONE

W3DGM.....	22,400-133-32	W1JYH.....	9500-88-20
W9ZRP.....	18,600-117-31	W1YBH.....	9350-82-22
W4TVO.....	18,480-112-33	K2DSW.....	9350-79-22
W0AGD.....	17,850-102-34	W5JDN.....	9000-69-25
W9KDV <sup>2</sup> .....	16,800-105-32	W5NOH.....	9000-67-25
W5NSS.....	13,390-98-26	W2ZVW.....	8800-73-22
K2OHS/1.....	13,125-100-25	K2AFQ.....	8280-66-23
W1CRW.....	12,470-86-29	W5PBX.....	8100-60-27
W2JGV/1.....	11,700-75-30	W5MGC.....	7935-69-23
W3BNR.....	11,500-92-25	W4UJ.....	6720-57-21
W9KLD.....	10,625-81-25	W5NYH.....	6360-53-24
W4IA.....	10,465-84-23		

<sup>1</sup> W1WPR, opr.    <sup>2</sup> W9VYF, opr.

After making 330 c.w. QSOs at W1AW, statistics-minded W1WPR sat down and did some figuring on the distribution of appointments. There were 273 stations worked once, 78 two-banders, 14 three-banders, and one four-bander. Here's the way the 273 different broke down: ORS 138, 00 47, EC 24, RM 18, OBS 13, OPS 7, Asst. Director 5, SCM 5, Director 4, PAM 3, OES 2, Headquarters 2, Vice-Director 2, QSL Manager 2, SEC 1. Since those holding more than one appointment can pick any one of several to identify themselves, the figures must be taken with a pinch of salt. Apparently, however, in a c.w. CD Party more than half your contacts will say "HR ORS."

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

## ATLANTIC DIVISION

**EASTERN PENNSYLVANIA** — SCM, Clarence Snyder, W3PYF — SEC: NNT, RM: AXA, PAM: TEJ, E. Pa. nets: 3850 and 3610 kc. ZRQ has a new 300-watt rig. NNV reports his son, AQL, was home for a visit from Lowery AFB. His other son, AQM, just made his first contact on 2 meters. FPC just passed his 20th year of having the same call and living at the same QTH. FPC invites interested amateurs to visit South Philadelphia Amateur Radio Club every Tue. night at 17th and Tasker. ZSH is back from a vacation in W9-Land. BIP is back on the air with a new shack. TEJ, E. Pa. PAM, is lining up liaison for the PFN to other nets for the coming season. LJ, act. mgr. for YDX, reports the heat and vacations caused traffic to drop off at that QTH. CBZ, the Reverend Paul Sheffer, Lutheran pastor at Ferndale Lutheran Parish, is a new amateur. He is on the air now with a new Viking Adventurer and formerly was licensed under the call 3ARP in York around 1938. The new club at Levittown has adopted the name Windsor ARC. Officers are NME, pres.; QHF, vice-pres.; and WUY, secy.-treas. The Club holds code and theory classes every Mon. at the Youth Center in the Holly Hill section of Levittown. Meetings are held at the same place the first Wed. of every month. MAC and the Delaware River Net meet regularly on 3910 kc. at 9:15 Mon. through Fri. Invitation is issued for applications for ARRL appointments as EC, OO, OPS, ORS, OES, and OBS. A card to your SCM will bring details. AZZ, of Wormleysburg, advises that he now is stationed in Germany and operating under the call DL4PR with a Globe King. He is looking for 20-meter contacts with the gang around Harrisburg. WUE now is asst. mgr. of the Interstate Phone Net. BES missed Field Day for the first time since its inception because of his wedding anniversary. RSC is off the air while moving to a new QTH. WN3CKP is operating airborne mobile on 145,360 Mc. WJY spent the month of July operating portable at Lake Harmony. Traffic: W3CUL 1048, YDX 221, TEJ 173, BIF 100, WUE 99, BUR 85, OK 85, GIY 61, YAZ 61, TSY 60, BNR 51, PYY 29, DUI 22, BIP 18, PYF 14, ELI 12, UOE 6, YVX 6, ZRQ 6, BES 3, BGA 3, OML 2.

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA** — SCM, John W. Gore, W3PRL — The MEPN held its fourth annual picnic at Gambrills State Park near Frederick, Md., on Sun., July 24th. Among the 384 present were George Hart, 1N1M, ARRL National Emergency Coordinator, and Gil Crossley, 3YA, Atlantic Division Director. Mobiles were talked in to the mountain top on 2, 6, and 10 meters. A short mid-day shower was tolerated by the 384 present and soon forgotten in the day's activities. Liz, CDQ, found time to attend the picnic as well as the YLRL Convention at Santa Monica. Dr. Willis C. Gore, of the Johns Hopkins faculty, gave a talk and demonstration on "Parasitic Beams" at the July 11th meeting of the CARC. Leo Hruska gave a talk and demonstration on "No B Auto Convertors for Short Waves" at the July 25th meeting. The ARRL film "Standing Waves" was shown at the July 5th meeting of the Antietam Radio Assn. of Hagerstown. At the July 19th meeting of the ARA the club's equipment console building project was started. WN3CVC has joined the fraternity with a Johnson Adventurer on 80 and 40 meters. KMA is working on his 80-, 40-, and 20-meter antennas. KMA also has completed a broad-band 144-Mc. convertor as per the *Handbook*, and found it to be the best he has used to date. RV, with 10 watts to a 2E26 on 6 meters, has worked 7 states including California. KTR has acquired a restful mountain cottage at 2500 ft. elevation in the Blue Ridge Mountains near Big Meadows, where in his spare time he operated portable with a TBS-50-C into a Windom. QCB finally worked 1AW after 6 years, during the CD Party July 16th. BUD has been appointed EC for St. Marys County. TRG received WAS in July. WV worked VQSAX and also worked UR3B for 3B's second contact after getting settled. WAF worked his first Baffin Island station. Traffic: (July) W3WG 1383, WV 508, UCR 197, RV 63, PRL 62, COK 32, BUD 26, PKC 26, KMA 15,

OYX 6, WAF 6, TBG 4, CDG 2. (June) K3WBJ 404, W3CVC 383, COK 67, PKC 56, KMA 10, WKB 2.

**SOUTHERN NEW JERSEY** — SCM, Herbert C. Brooks, K2BG — SEC: W2ZVW, PAM: ZI, I am very grateful for the support that I received in the recent balloting which resulted in my reelection. KTR has been appointed ORS and BZJ recently moved to Pennington. Welcome to the section, Walt. RG continues to do a fine job of handling traffic and is NCS of two c.d. drills each Sun. K2CPR made over 41,000 points in the recent CD Party. K2HZR has a new receiver and is keeping regular traffic skeds. ZI has a traffic sked with the YMCA Boys' Camp at Camp Wilson, N. J. After a very successful Field Day, SJRA is making plans for the Field Net. The SJRA DX editor, SDB, gives lots of encouragement to the DX aspirants of the Club. The Burlington County Radio Club continues its regular weekly drills alternating between the club station, K2KED, and the area c.d. station. No doubt because of vacations, we have nothing to report from the Tri-City Amateur RC or from the SCARA. DVRA News keeps its members well informed by reprinting the Official Bulletins. K2ITP and ITQ are operating 2, 20, and 40 meters, and working hard for that WAS ticket. K2JKA is manager of the Stag Net on 3890 kc. Mon. through Fri. at 0900 EDT. ECs are needed in the southern counties to coordinate the available emergency facilities. Please contact your SCM or SEC. Traffic: (July) K2JKA 184, W2RG 166, K2HZR 138, W2HDV 25, ZI 9, K2CPR 2, (June) W2YRW 47.

**WESTERN NEW YORK** — SCM, Edward G. Graf, W2SJV — Asst. SCM: Jeanne Walker, 2BTB, SEC: UTH/ PRL, RM: RUF, PAMs: TEP and NAI. NYS meets on 3615 at 6 p.m. and 6:30 a.m.; NYSS on 3595 at 5:30 p.m.; NYSR on 3595 at 8 p.m.; NYS on 3925 at 6 p.m.; NYS C.D. on 3509.5 and 3993 at 9 a.m. Sun.; TCNP 2nd Call Area on 3970 at 7 p.m.; SRPN on 3980 at 10 a.m.; ISPN on 3870 at 3 p.m.; LCP Mobile on 2; Niagara Mobile Net on each Sun. at 11 a.m. on 3885 kc. KN2MMB is owner of a taxi company with ham gear installed. CFJ renewed as EC for Jefferson County. Officers of the Syracuse V.H.F. Club are RBK, pres.; HNH, vice-pres.; JMI, secy.-treas.; RHQ, act. mgr. Many of the group are getting on 6 meters, with new stations as follows: K2JIM, GEI, EPH, and KN2LXN. The new club participated in the V.H.F. SS and Field Day. K2EVJ is operating the high school club transmitter at K2KHB. A very nice article on c.d. by PPY, Erie County EC, appears in Aug. QST. K2DYB has been appointed OO. K2DYC is active on 50.4 Mc. between 1900 and 2100. RSV is active from the Colton Area. An ARATS meeting was devoted to c.d. demonstration, instructing Novices in a practice drill. The Elmira ARA meeting at the club shack turned into a weiner roast and inspection of the club's new 20-meter beam. Sydney, Binghamton, and IBM Clubs held a picnic at Perch Pond with a transmitter hunt. UJS held a program chairman. ZOL vacationed in New England. DLB dropped the "N" from his call. TXS operates TV and radio business and ham radio from the same room in his home with no TVI. SHZ and CYV are mobile on 10 meters. CVX and JVZ are revamping mobile gear for new cars. K2HVZ is visiting KN2INP. ZRC made Extra Class. MSJ is going to Roch. Tech. JGJ is on 6 meters. The Federal-State Flood Forecasting Service has had the cooperation of the URN and RVN Nets in getting valuable WX information into the nets once a month. Stations in the vicinity of Olean are needed to give better coverage. It would be a nice gesture if at least two stations from this vicinity in W.N.Y. could lend a hand once a month on 3585 at 9:30 p.m. Write or send a message to 3UVD for further details. QQ vacationed in VE3-Land. ZOL and CTQ were active in the Powder Puff Derby. SHZ finds the transmitter works better with just one side of the mike cable grounded. HXG renewed as Seneca Co. EC. YPW renewed as ORS. DJH moved to Warrensburg. KN2MZR and MZP are on the air. NYSR, New York Restricted Speed Net, is operating at 1800 on 3595 kc. with K2CLA as mgr. and K2CQO asst. mgr. UKQ's operating time is confined to c.d. RZF renewed as Delaware Co. EC. UTH renewed as OES. K2CEH has a three-element beam on 6 meters. K2DUO had an amateur radio station at Lafayette Theatre for a demonstration. Traffic: (July) W2URF 345, YGW 145, ZRC 145, BXP 108, BNC 101, QHH 49, K2AMZ 48, W2ZLT 44, K2DSR 26, W2RQF 16, DSS 15, EMW 10, RUT 3, K2GAL 2, W2MYN 2. (June) W2RQF 19, K2DG 18, (May) W2RQF 11.

**WESTERN PENNSYLVANIA** — SCM, R. M. Heck, W3NCD — SEC: GEG, RMs: UHN, NRE, and NUG. PAMs: AER and LXE/VKD. The Mercer County Radio Association recently held its annual picnic. Originally

scheduled for the local park, it was held in the evening at the residence of SYZ because of quite a bit of dampness. However, it was well attended and an enjoyable affair. The Breeze Shooters Net meets on 29 Mc. each Mon. at 8. BSN also reports officers for the coming year are SJK, pres.; QYF, checker; TTR (YL, secy.; and PII, SIR, and TDC, directors. SJK says that several persons have gotten tickets, thanks to BSN's Mon. code practice. UJP found much of his signal diverted to ground through his adjustable low-pass filter and advises users of same to check adjustment of them. KLP has a transistor receiver and one audio stage of his transmitter and also uses one. RUZ now has a 101X. WHA and KPS are recent volunteers as NCS. BSN now numbers about 251 local ground-wave members. The Radio Association of Erie boys held a hidden transmitter hunt, with MED putting out the signal and YKE, TMK, LKJ, STK, QN, and TLA tracking him down. The Annual Hamquet was observed and attended by a fine crowd. VNC is looking for an HT-18. MNP has erected a beautiful new tower for his 10- and 20-meter beams. The South Hills Brass Pounders and Modulators August Hamfest was held on schedule and was well attended. Everyone had a fine time even though a heavy rain came in at about the middle of the activities. WIQ, consistently BPL, has been vacationing in Florida. Traffic: (July) W3WVQ 697, YA 48, ZEW 37, ZEG 30, SIJ 16, UHN 9, KNQ 6.

## CENTRAL DIVISION

**ILLINOIS** — SCM, George T. Schreiber, W9YIX — Section Nets: ILN 3515 kc.; IEN 3940 kc. SEC: HOA. RMs: BUK and MRQ. PAM: UQT. Cook County EC: HPG. News has been very scarce this month. Have you chaps been neglecting to send it in, or have you just been fishing? Members of the Knox-Warren Radio Assn. furnished communications July 4th to the Galesburg emergency police doing automobile traffic duty. VSX/9 was base station. CLH likes his new 20-meter three-element beam and keeps the QSL Bureau busy. EOL is back on 40 meters with a vertical, having returned to the section from Iowa. RMI will be out of the Navy soon and will have a new QTH in Peoria. Hope he checks into the ILN, they need him in that vicinity. FNX is chasing DX with his new Ranger. A new Technician heard is ICW. OEV does well with 100 watts on 2 meters. HMM has moved to Sycamore. The Quad City Club has bought a bus and the membership, under the leadership of ONX, the local EC, is busy overhauling it and installing radio gear. 6LPK writes to tell the fellows they are talking to VTO, formerly of Western Springs, when they contact him on 80 meters. BA, with much help from ATU, UWP, TCX, NPM, and EWU, furnished a complete communications system for the Southern Illinois Sports Car Club hill climb on July 17th. The St. Clair Amateur Club has identification buttons 3½ inches in diameter so the members can "see" who is at the meeting. 8WKH now is K9AVC at Scott AFB. KTH threatens to be back on the air any day now. DO picked up his 17th BPL certificate. ICF has so much new equipment that it would take the entire column to tell about it. He likes his new 160-meter Windom. SHM spent six months in KH6-Land but reports there is no place like home. UGG and UGR have moved to Davenport. CMR is trying out single sideband. KDX received his engineering degree upon June graduation. Congratulations to AOB, who got married. The Central Illinois Radio Amateur Club picnic was a honey. Flowers to the *Oscillator*, the bulletin of the Tri-Town Radio Amateurs Club, on the excellent Field Day number. The editor is OQN. EVA introduced YL 7QYA to the telegraph gang at KSB 47, the Chicago Police sta-

tion, and she astonished all, even Director UQT, by slipping in and copying the circuit. BII has built a Globe Scout with 155-volt mains and a vibrator supply for mobile use in his car. The Kankakee Amateur Radio Club staged a hidden transmitter hunt on July 30th. First place was taken by LCH, with TBU second. KLD hid the transmitter. CWH passed the Extra Class exam. Vice-Director QIZ won nine fishing lures and EU a deep fryer at the QCWA picnic. Now they have teamed up, QIZ to catch the fish and EU to fry 'em. Route Manager BUK's tower buckled in the middle when he raised it after trying to install a 2-meter beam. A new call heard on ILN is KMZ. GAS built a new Ranger. HPJ ran a commercial communication set-up for the National Conference of Governors held in Chicago and introduced several of them to ham radio. Traffic: (July) W9DO 1283, OFR/9 633, YYG 191, OR 116, CSW 93, VHD 54, YIX 48, IDA 47, VSX 36, CTZ 25, BUK 24, SME 21, BII 19, LRV 19, LXJ 17, EHS 12, SXL 12, BA 11, CEE 11, CZB 10, MRQ 9, CLH 8, VER 8, JMG 4, PHE 3, FNX 2, KLD 1. (June) W9IDA 367, USI 46, HPG 33, VSX 16, FRP 4.

**INDIANA** — SCM, George H. Graue, W9BKJ — This report is being compiled by BEM, Allen County EC, while our SCM is vacationing in Michigan. FMJ and BKJ operated mobile and portable /8 and kept daily schedule with both section nets. AQR is having receiver trouble. IOP lost some of his equipment in an electrical storm. NZZ still is moving traffic into the Arctic despite terrific temperatures. CAEN had 20 sessions and a traffic total of 50, as reported by EHZ. NTA reported 52 sessions and a traffic total of 254 for IFN. VSH received an A-1 Operator certificate. N9FJN, POS, KDH, and KDW passed the General Class exam. BEM has a three-element quad working fine. JFJ has a new Ranger. UHV is active on 50 Mc. DQI is a CAP cadet. MZE, ex-DL4CT, expects to attend Indiana Tech. in Ft. Wayne this fall. N9RVV is organizing a Novice net in the southern part of the State. OG is new in Evansville; also N9AMT and YZJ. DGA is vacationing in the Smokies and will visit South Carolina for his 48th state. ZZA is 6-meter mobile and is vacationing in Yellowstone Park. YRF has changed to a pair of 812s. The IRCC Field Day plaque was won by the Michiana Radio Club station, AB/9. Omission in last month's report was the Field Day message from LIT/9 to the SCM. MUR has resigned as EC for Wayne County and has been replaced by GOS. 6AMU is new at Bunker Hill AFB. DOK is moving his shack into the basement. CC is putting up a 10-meter close-spaced beam. The only BPL for the month is NZZ. No report has been received from Peggy, JUJ, for the third consecutive month. Traffic: W9NZZ 1334, T2 293, UQP 140, EHZ 136, WRO 113, ZYK 97, NTA 91, TQC 75, ZRP 36, BKJ 35, CMT 35, ZIB 21, CTF 15, DOK 14, GDL 11, STC 9, AQR 8, BDP 6, QR 6, FGX 5, FJS 5, PPS 5, CC 4, DGA 4, HSG 3, EQO 2, NH 2, VNE 2, AYD 1.

**WISCONSIN** — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAMs: ESJ and GMY. RMs: IXA and RTP. Nets: WIN, 3685 kc., 7 p.m. daily; BEN, 3950 kc., 6 p.m. daily; WPN, 3950 kc., 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile and c.d. frequency: 29,620 kc. KQB has new SX-96 and plans a 40-meter vertical and a coax-fed dipole on 80 meters for antennas. WN9NOD is new in West Bend. RQK is having FB results with 15-watt mobile on 75 and 10 meters. KHR is running 40 watts to a 6BQ6 final and has a Super Pro receiver. JEF won the Green Bay Mike & Key Club 40 meter contest with 187 cards in 2 months. UTV got tangled up with 6UTV during the CD Party on the same frequency. DIK made 45,175 points in the CD Party. SZR sends his report from Seattle, Wash., while on vacation. The NWRC held its annual picnic July 24th at Brunet Park, Cornell. KN9ASH, KN9AQS, and KN9AQT are new calls at Wausau. UOI mobilized to Colorado. BXJ caught the s.s.b. bug from GRX. YOX is building a 60-watt mobile. SIE is on with a Ranger. FCB received his General Class ticket and will be going to U. of W. this fall. YOS and YOX will attend U. of W. Ext. in Milwaukee this fall. ITI has mobile in the car now. New certificates (WIN) were issued to YZA, IXA, CCO, BVG, PVN, KQB, and DAJ. Point Radio Amateurs furnished communications for the Lions Parade and American Legion Picnic. AJU reports WPN cleared 145 messages with 661 QNT in June. HEF and ZLD have new DX-100 transmitters. EFF joined the Air Force. HAH put up a 40-meter ground plane. WYE has a new three-element beam on 6 meters. ZDU has a new B&W 5100. VOD is going to a kw. UDK is building a dual 20- and 40-meter beam. KN9ASW has been operating ODD at Marquette U. HDV has been active on 14-Mc. s.s.b. UCO, OMT, and DWT are new members of the Green Bay 28-Mc. Net. OMT qualified for RCC. KXK received a QSL from FG7XB making 137 confirmed. A Wisconsin section meeting has been scheduled for 3 p.m. in connection with the Mancorad Fall Hamfest in Manitowoc Oct. 29th. Plan now to attend. Traffic: (July) W9KQB 91, SAA 58, BVG 32, RQK 20, YZA 20, RQM 13, KHR 11, JEF 10, RKP 9, DIK 7, FFC 7, OVO 7, UTV 7, CCO 6, GMY 6, SZR/9 6, AJU 2, TAL 1. (June) W9RTP 46, BVG 34, UIM 17, IXA 14.

(Continued on page 84)

## ILLINOIS QSO PARTY October 21-30, 1955

A state-wide contest, in which all Illinois amateurs are eligible to take part, will be held from 12:01 A.M. October 21st to 11:59 P.M. October 30th.

**Rules:** (1) Object is to QSO as many Illinois stations in as many of the 103 Illinois counties as possible.

(2) Only one contact with a given station may be counted unless the station moves to a different county.

(3) Any and all amateur bands and any mode of transmission may be used.

(4) A contact shall consist of the two-way exchange of signal reports and county names.

(5) Multiply the number of contacts by the number of Illinois counties worked to determine final score.

(6) Valid contest entries must list all stations worked together with their county locations and should be submitted to the Illinois SCM. They must be postmarked not later than November 15, 1955.

## About "S" Meters

**W**E ARE all familiar with the "S" meter calibration on communications receivers and know that indications on that meter present a measure as to the strength of signal being received in comparison with other signals. This is the basic purpose of the meter and in that function it serves well, but what about the calibration of that meter as far as its being a standard is concerned?

**A**LTHOUGH there are occasional departures, the standard S-unit interval has come to be established at about 6 db. If you dig into the subject a little further, you will come up with the fact that a signal indicating S-9 on one receiver will not necessarily be S-9 on another.

**T**HE "S" meter readings can be quite different even on identical receivers run off the same production line unless some special care is employed during manufacture. Actually, "S" meter readings between different makes of receivers are about as standard as a yard determined by the stride of a six foot man and a four foot man.

**B**ASICALLY an "S" meter is a current reading device connected in some point of the receiver circuit controlled by AVC where a change in received signal strength will cause a change in current flow. Whatever will affect that circuit will also affect the current readings.

**W**E AT Hallicrafters employ a 0-5 MA meter connected in series with the B+ to an RF or IF tube. This is a very effective circuit which will immediately indicate changes in plate current caused by a variation of AVC voltage at the grid of the tube according to the strength of the signal being received.

**I**F A conventional meter is used in this circuit, the meter calibrations would be somewhat confusing as they would be backwards. To avoid complex bridge network circuitry we simply purchase our "S" meter movements with the springs reversed, so with no current through the meter, the pointer rests at the right hand side of the scale.

**A**LTHOUGH all tube manufacturers fabricate tubes to certain industry standards, there still will be differences in the actual operating characteristics of each tube. Tolerances of tubes and other parts in the communications receiver may also be affected by aging and other conditions to which the receiver is subjected during its lifetime. Therefore, the "S" meter readings will be affected also.

**I**T IS obvious that with a poor antenna the signal strength on a given signal will be less than the same signal on a better antenna. Hence, an "S" meter report should be considered in view of the antenna used. To provide some standardization, we at Hallicrafters have assumed that a 50-microvolt signal at the antenna posts on the 80 meter band is an S-9 signal. To afford more versatility to the meter, on our large sets we also provide a second scale calibrated in microvolts. On certain larger receivers it is possible to hold this calibration fairly close throughout the tuning range. However, production variations in tube Gm preclude extreme accuracy in calibration and, therefore, don't consider your receiver as a Standard Field Strength Meter.

**A**GING of the receiver and resultant changes in component values and operating characteristics may affect the original factory set-up of the "S" meter, thereby making it impractical to use an "S" meter as a standard of measurement. But even though the "S" meter cannot be used as a measurement standard unless calibrated frequently from a local standard signal source, it is still an invaluable aid and helpful tool in the operation of an amateur radio station.

— Tony Dambrauskas, W9GXH

*Bevel Halligan Jr.* *W. J. Halligan* W9AC for **hallicrafters**





# New

## Heathkit VFO KIT

MODEL VF-1

**\$1950**

Ship. Wt. 7 lbs.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical

and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard 1/2" crystal holder. Construction is simple and wiring is easy.

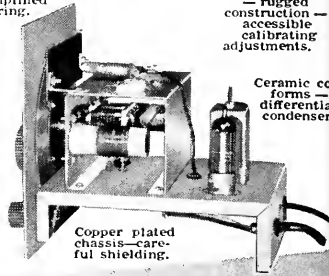
- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OAZ voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

Open layout,—easy to build—simplified wiring.

Smooth acting illuminated dial drive.

Clean appearance—rugged construction—accessible calibrating adjustments.

Ceramic coil forms—differential condenser.



Copper plated chassis—careful shielding.

## Heathkit AMATEUR TRANSMITTER KIT



MODEL AT-1

**\$2950**

Ship. Wt. 16 lbs.

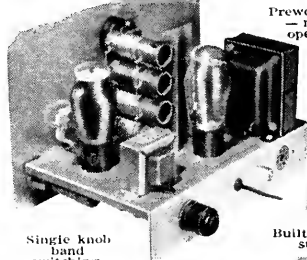
### SPECIFICATIONS:

Range 80, 40, 20, 15, 11, 10 meters.  
6AG7 ..... Oscillator-multiplier.  
6L6 ..... Amplifier-doubler.  
5U4G ..... Rectifier.  
105-125 Volt A.C. 50-60 cycles 100 watts. Size: 8 1/4 inch high x 13 1/4 inch wide x 7 inch deep.

Crystal or VFO excitation.

Prewound coils—metered operation.

Rugged, clean construction.



Single knob band switching.

Built-in power supply.

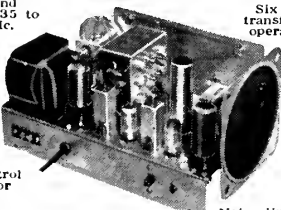
52 ohm coaxial output.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

## Heathkit COMMUNICATIONS RECEIVER KIT

Four band operation 535 to 35 Mc.

Stable BFO oscillator circuit.



Six tube transformer operation.

Electrical bandspread and scale.

RF gain control with AVC or MVC.

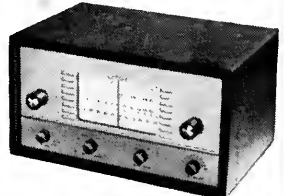
5 1/2 inch PM Speaker. Headphone Jack.

Noise limiter—standby switch.

### SPECIFICATIONS:

Range.....535 Kc to 35 Mc  
12BE6 ..... Mixer-oscillator  
12BA6 ..... I. F. Amplifier  
12AV6 Detector AVC—audio  
12BA6 B. F. O. oscillator  
12A6 ..... Beam power output  
5Y3GT ..... Rectifier  
105-125 volts A.C. 50-60 cycles, 45 watts.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.



MODEL AR-2

**\$2550**

Ship. Wt. 12 lbs.

### CABINET:

Proxylon impregnated fabric covered plywood cabinet. Shipp. weight 5 lbs. Number 91-10, \$4.50.

**HEATH COMPANY**  
BENTON HARBOR 9, MICHIGAN



## New HEATHKIT DX-100



MODEL DX-100

Shpg. Wt. 120 lbs.

**\$189.50**

Shipped motor freight unless  
otherwise specified. \$50.00  
deposit with C.O.D. orders.

- R.F. output 100 watts Phone, 125 watts CW.
- Built-in VFO, modulator, power supplies. Kit includes all components, tubes, cabinet and detailed construction manual.
- Crystal or VFO operation (crystals not included with kit).
- Pi network output, matches 50-600 ohms non-reactive load. Reduces harmonic output.
- Treated for TVI suppression by extensive shielding and filtering.
- Single knob bandswitching, 160 meters through 10 meters.
- Pre-punched chassis, well illustrated construction manual, high quality components used throughout—sturdy mechanical assembly.

## PHONE AND CW TRANSMITTER KIT

This modern-design Transmitter has its own VFO and plate-modulator built in to provide CW or phone operation from 160 meters through 10 meters. It is TVI suppressed, with all incoming and out-going circuits filtered, plenty of shielding, and strong metal cabinet with interlocking seams. Uses pi network interstage and output coupling. R.F. output 100 watts phone, . . . . . 125 watts CW. Switch-selection of VFO or 4 crystals (crystals not included).

Incorporates high quality features not expected at this price level. Copper plated chassis—wide-spaced tuning capacitors — excellent quality components throughout—illuminated VFO dial and meter face—remote socket for connection of external switch or control of an external antenna relay. Preformed wiring harness—concentric control shafts. Plenty of step-by-step instructions and pictorial diagrams.

All power supplies built-in. Covers 160, 80, 40, 20, 15, 11 and 10 meters with single-knob bandswitching. Panel meter reads Driver Ip Final Ig, Ip, and Ep, and Modulator Ip. Uses 6AU6 VFO, 12BY7 Xtal osc.-buffer, 5763 driver, and parallel 6146 final. 12AX7 speech amp., 12BY7 driver, push-pull 1625 modulators. Power supplies use 5V4 low voltage rect., 6AL5 bias rect., 0A2 VFO voltage reg., (2) 5R4GY hi voltage rect., and 6AQ5 clamp tube. R.F. output to coax. connector. Overall dimensions 20 $\frac{3}{4}$ " W x 13 $\frac{3}{4}$ " H x 16" D.

## Heathkit GRID DIP METER KIT



MODEL GD-1B

**\$19.50** Ship. Wt.  
4 lbs.

The invaluable Instrument for all Hams. Numerous applications such as pre-tuning, neutralization, locating parasites, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1 $\frac{1}{2}$  meter Ham bands. Complete frequency coverage from 2—250 Mc, using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at \$3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

## Heathkit ANTENNA COUPLER KIT



MODEL AC-1

**\$14.50** Shpg. Wt.  
4 lbs.

Poor matching allows valuable communications energy to be lost. The Model AC-1 will properly match your low power transmitter to an end-fed long wire antenna. Also attenuates signals above 36 Mc, reducing TVI. 52 ohm coax. input—power up to 75 watts—10 through 80 meters—tapped inductor and variable condenser—neon RF indicator—copper plated chassis and high quality components.

## Heathkit ANTENNA IMPEDANCE METER KIT



MODEL  
AM-1

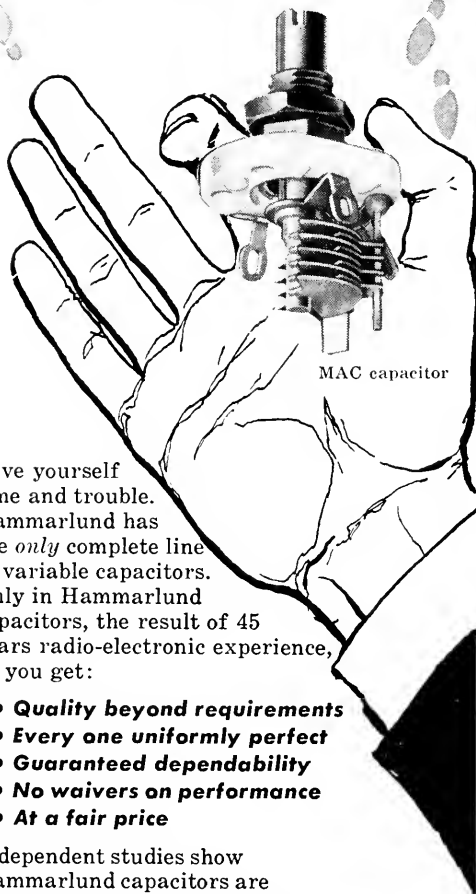
**\$14.50** Shpg. Wt.  
2 lbs.

Use the Model AM-1 in conjunction with a signal source for measuring antenna impedance, line matching purposes, adjustment of beam and mobile antennas, and to insure proper impedance match for optimum overall system operation. Will double, also, as a phone monitor or relative field strength indicator.

100  $\mu$ a. meter employed. Covers the range from 0 to 600 ohms. Cabinet is only 7" long, 2 $\frac{1}{4}$ " wide, and 3 $\frac{1}{4}$ " deep. An instrument of many uses for the amateur.

**HEATH COMPANY**  
A SUBSIDIARY OF DAYSTROM, INC.  
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# Do you "SHOP AROUND" for Capacitors?



Save yourself time and trouble. Hammarlund has the *only* complete line of variable capacitors. Only in Hammarlund capacitors, the result of 45 years radio-electronic experience, do you get:

- **Quality beyond requirements**
- **Every one uniformly perfect**
- **Guaranteed dependability**
- **No waivers on performance**
- **At a fair price**

Independent studies show Hammarlund capacitors are preferred over any other make. So, there's no need to shop around for capacitors, others have done it for you—and they prefer Hammarlund.

For a free copy of the Hammarlund Capacitor Catalog, write The Hammarlund Manufacturing Co., Inc., 460 West 34th St., New York 1, N. Y. Ask for Bulletin C-10



**HAMMARLUND**  
Since 1910

## DAKOTA DIVISION

**NORTH DAKOTA** — SCM, Elmer J. Gabel, W0K7Z — The 'Phone net meets on 3845 kc. at 6 p.m. Mon. through Sat., the c.w. net on 3670 kc. at 6:30 p.m. Mon., Wed., and Fri. Let's dust off those "bugs" and give AOX a workout. The Red River Radio Amateurs of Fargo are working on next year's Hamboree. It's a new YL in the home of ODX, born July 12th. Congratulations to Tom and his XYL, Tom is one of the few North Dakota hams on s.s.b. He runs an 813-10 A rig. K0ATK has a new HQ-140X and found time to install the keying kit in his Ranger. VCQ is building a 14-Mc. beam. MXD back from the Park in July, is recuperating from a fall. In his words, he "missed a peak while playing mountain goat." DX-100s on the air and assembly line: SDN, BFM, and DIV. New hams: K0BWY, Q0B's XYL, K0CBD, and CBE at Hillsboro, KN0CCA at Bismarck. Traffic: W0K7Z 30, VCQ 26, UBG 22, KLP 21, OWY 20, HVA 15, MQA 9, K0ATK 8, W0OAB 4, BFM 3, GJJ 3, RAR 3, K0AIP 2, W0BEA 2, DNJ 2, PHC 2, PMZ 2.

**SOUTH DAKOTA** — SCM, Les Price, W0FLP — The emergency net is progressing under the able leadership of OXC, of Pierre, and has all the new 140X receivers and part of the BC610s that will play so vital a part in the South Dakota Emergency Net. The South Dakota Convention was held at Yankton, S. Dak., Sept. 3rd and 4th. LKO, OSQ, and QPC returned after three months on the Island of Guam, where contact was kept with K0FCE, at Ellsworth Air Force Base, Rapid City, on 20 meters. QKV has a new QTH with 900-ft. long wire. We have some very welcome new hams in Rapid City. They are KN0CDQ, the XYL of KAS, KN0CDN, the XYL of TOY, and KN0CDO, the XYL of QEK. Rapid City's youngest ham, KN0AKB, was eleven on Sept. 1st. Bill and Joan Drededahl, KAS and CDQ, are leaving for New Mexico. A report on the section c.w. net will be welcomed next month. The NQ Net reports attendance of 17 for July and some traffic handled. Traffic: W0GDE 88, OH 72, SCT 42, SMV 31, RRN 21, BLZ 19, DVB 14, QKV 7, RSP 4, GWS 3, WBW 2.

**MINNESOTA** — SCM, Charles M. Bove, W0MXC — Asst. SCM: Vince Smythe, 0GQK. SEC: GTX. RMs: KLG and DQL. PAMs: JIE and UCV. The ARRL has approved the Stillwater High Radio Club as a club affiliate. For information about the time and date of club meetings contact Bob Watson, YOC, who lives at 1022 So. Fourth St., Stillwater, Minn. KLG has been appointed assistant manager of the Tenth Regional Net. RLQ and TQA made BPL for July. TPN has moved to Memphis, Tenn. GFR has been mobiling up in Canada on week ends and checking into the 'phone net. TUS has been operating on an average of 6 to 7 hours a day. QDP now has WAC. GBG was in the hospital in St. Paul and YUN in the hospital in Crosby. BHY also is in the hospital in St. Paul. We hope that when you read this Frank, Clyde, and Swanny are well on the road to recovery. VBD has been operating portable at Lake Washington. In July picnic were held by the Minneapolis Radio Club, the St. Paul Radio Club, the St. Cloud Radio Club, and the Arrowhead Radio Club of Duluth, held at Grand Marais. Traffic: W0HFY 244, KLG 210, TUS 164, TQA 108, RLQ 107, KJZ 89, SYD 86, RVO 75, WMA 54, LUX 51, LST 46, WVO 46, OHS 31, VRK 31, KFN 27, QDP 27, VBD 27, OSJ 24, RLI 23, QNY 21, UNG 21, VXO 18, MBD 16, NTV 15, BUO 13, MXC 12, TQQ 10, GTX 9, VOA 9, FCU 6, TKX 6, RLQ 5, VEP 5, QVR 4.

## DELTA DIVISION

**ARKANSAS** — SCM, Owen G. Mahaffey, W5FMF — This section of the country has been almost too hot for much ham activity. HZU is a new ham in Rogers. K5AZG is a new ham in Springdale. BCZ has a new 75-meter 'phone rig on in Little Rock. SXM is a new ORS. EUQ is building transmitters for 6 and 2 meters, also a 40-meter mobile rig. He reports having received QSLs from 2EUQ, 8EUQ and 9EUQ. Get the rest of them, Bob. All Northwest Arkansas hams take notice: How about a Northwest Arkansas Amateur Radio Club? Let's hear from you. Traffic: (July) W5VAA 20, EUQ 4, ZJI 4. (June) W5CAF 53, ZJI 2.

**LOUISIANA** — SCM, Thomas J. Morgavi, W5FMO — BMD reports that a gathering of the members of the Ark-La-Tex Teenage Net is in the planning stage for Shreveport. This net meets on 3820 kc. at 4 p.m. CST on Mon., Wed., and Sat. K5AIE has been burning up the Novice c.w. band. He took the test and is expecting his Conditional Class license. CEW worked two new countries for a total of 201 worked and 192 confirmed. TRQ now has the new 1625 final on 75-meter 'phone and 40-meter c.w. The Lake Charles Radio Club is holding transmitter hunts every three weeks with about 15 mobiles taking part. ZSP has moved to a new QTH and expects to have antennas up soon and get back on the air. FKA is back from a trip up Jersey way. SQI received his WAS and WAC certificates. He worked 11 countries in one night with 100 watts and a 33-foot vertical on 20 meters. NDV is interested in starting an 80-meter net in Louisiana. All interested should get in touch with him. Our heartfelt sympathy to VEU on the loss of his XYL.

(Continued on page 86)

# Performance Beyond.



THE NEW

If you want a really fine receiver...one that will give you finer performance beyond the others you've operated, you want the new PRO-310.

Frequency readings to 1 part in 5000; continuously calibrated and spread over the entire range; single sideband operation; exceptional stability; high image rejection; and many other fine features will add up to finer listening whether you're a DX enthusiast, CD volunteer, or just a regular band-prowler.

Three years of intensive design and research engineering went into this rig plus the Hammarlund "know-how" developed by making thousands of sets for government service.

So, if you are one of those who demand the finest performing equipment available, look the new PRO-310 over. If your dealer doesn't have one now, he'll have one soon. Get specs and other information either from him or by writing The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1, N. Y. Ask for Bulletin R-10

THE *Heart* OF THE

**PRO-310**

Newly developed front-end with three tuned circuits but only one RF tube amplifier provides remarkable selectivity and ultra-high signal-to-noise-ratio.



Since 1910

## HAMMARLUND

## PRECISION GLASS ENCLOSED CRYSTALS

Crystals of extreme stability, over a complete range of 800 cycles to 5 mc.

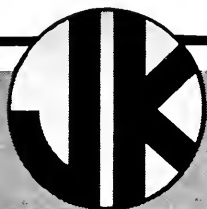


JK  
G-3

(Actual Size)



JK  
G-12A



PRODUCTS

# FREQUENCY MANAGEMENT SPECIALISTS

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Write for technical catalog

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in July. The Onachita ARC Field Day was a big success with CNG, MIWE, EGK, CQZ, EB, POB, FSN, YAD, UDX, PZL, and PVE participating and making 469 contacts. Looks like HEJ is headed for s.s.b. ARRL CD appointees, please check the expiration dates on your certificates of appointment and mail to the SCM for renewal. Traffic: K5FFA 485, W5NDV 72 EZN 16, FMO 14, YSN 13, UGJ 12, SGI 8, CEW 2.

**MISSISSIPPI** — SCM, Julian G. Blakely, W5WZY — One of the hottest news items of the season is that JHS is taking to single sideband. YFJ reports 30 full AREC members for the Gulfport-Biloxi Area, with 100 supporting stations on 29,600 Mc., with circuits into EAN, CAN, and PAN. BSA passed up a choice QTH in Greenville when he saw YAR's antenna broadcast from the porch. He chose another location and is in a triangle formed by YTZ, KFF, and DQY. Ifi, WZY and WZZ are in the process of changing their QTH and will be off the air until the new antenna farm is ready. We are pleased to hear that VQE is doing well after a recent operation. GUC has dropped the "N." 9LBO (ex-5BUC) is Korea-bound. The XYL is carrying on with WN5BPZ. KN5DKK was heard portable from GAFB. K5AYP's boys now are KN5BAE and KN5BAF. Traffic: W5VME 122, JHS 60, EDE 34, EWE 22, YFJ 20, RIM 14, YAR 13, BTM 10, WZY 10, GDW 8.

**TENNESSEE** — SCM, Harry Simpson, W4SCF — SEC: RRV, PAAL, PFP, RM: WQW. The Memphis Club's Ham School was a great success, with 63 new Novices in that area! Total attendance for Novice and General Class instruction was 119. The School was under the capable direction of DCH, assisted by BCA, CLL, FRB, SCF, WBK, and WTJ. If other clubs are interested in information on this project, contact any of the above. PL still is under the weather. CLQ is hospitalized with a fractured disc. DVM had a parasitic appendix removed, and VZU is having a hospital check-up. As you read this, the c.w. net will be in full swing under the able leadership of WQW. JVM reports good newspaper and TV publicity for hams in the Chattanooga Area. UWA, Ky., informs us that WJH has a brand-new XYL. TZB is moving to Johnson City but will be back in Knoxville for school. K2KML is a new Tennessee resident. FLW reports 6 meters was open on all but two July days. DMU reports the Davidson County 10-meter Net now has 39 members. WQT made 69,390 points in the CD Party. FEO, Bays Mountain RC secy., sends a nice report. PVD received a sticker from 110 countries. NLJ sends a fine report from the Smoky Mountain ARC and says 16 members operated the club station, OLB, during Hillbilly Home-Coming. He reminds us that the 2-meter net meets Thurs. at 1930 EST on 145.2 Mc. Members of the Frye Amateur Radio Club this summer arranged amateur communications to a camp for diabetic children. It was beyond telephone areas but tied in by several skeds a day from Jack Reeves, IBB, to Vern Etter, IIB. Traffic: W4HH 154, OGG 149, POP 120, UWA 61, TZD 59, WQW 52, VJ 40, BQG 35, TZB 33, ILLR 25, SCF 23, PAH 16, HUT 14, UWA 13, UVT 12, JVM 7, HXS 3, DMU 2, CLQ 1, CXY 1, DCH 1, FLW 1, FRB 1, LRO 1, PVD 1, WQT 1.

## GREAT LAKES DIVISION

**KENTUCKY** — SCM, Robert E. Fields, W4SBI — SEC: CDA, RM: KKW. Acting PAM: NIZ. In spite of the hot summer months, traffic reports show a marked increase. The latest list of nominees for KPN certificates are as follows: UNJ, UWA, ZCL, FQT, AVJ, HTB, and KBY, making a total of 58 members on the roster. July statistics are as follows: 31 sessions, 420 total call-ins, 13.54 stations per session, 72 total traffic, 2.3 messages per session. WNH is running skeds on 2 meters, but still working on the 500-watt final for 2 meters. AIT has completed construction of a DX-100. KFI/XI, not to be outdone, is handling traffic from his mobile station. JSH, Fayette County EC, reports 14 full and 1 supporting AREC members. RM KKW reports the following: 55 sessions of the KYN, 37 active stations, traffic total 204, average 3.7 messages per session. Kentucky has a combined KYN-KPN bulletin, thanks to CDA, NIZ, RPF, KKW, SUD, BAZ, SBI, and others. Please note than an official report from ARRL on Field Day activities places 4FU in third place for Class A, with a score of 18,009. He is a member of the Ohio Valley Amateur Radio Assn. Floyd County hopes to have an amateur on the air soon as SBI recently conducted a Novice Class exam for Wade Moore of Prestonsburg. Traffic: (July) W4QCD 193, KKW 166, SBI 87, CDA 66, NIZ 63, UWA 61, HOJ 56, ZDB 41, JSH 35, HSI 29, ZLK 25, BZY 20, ZDA 17, KFI/XI 14, RPF 14, SUD 10, IAY 7, K4AIT 6, W4QMW 6, KRC 5, SZB 5, JCXN 3. (June) W4NIZ 106.

**MICHIGAN** — SCM, Thomas G. Mitchell, W8RAE — Asst. SCM: Phone, Bob Cooper, 8AQA; Asst. SCM C.W.: Joe Beljan, 8SCW. SEC: GJH. You will note by the traffic totals that this month was probably the low point of the year for activity. Next month should see us back up there in the running and all fired up for traffic. DX, SS, and what have you. About the time this write-up is in your hands, the QMN will be back on the winter schedule with ELW as the new RM. Our thanks to URM for the fine RM job and our best wishes to ELW in taking over. The new schedule will start Oct. 3rd with NUL in charge of the

(Continued on page 88)

# HOW TO CONVERT YOUR RECEIVER

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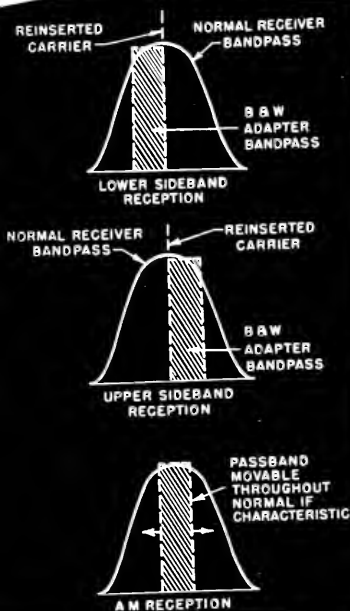
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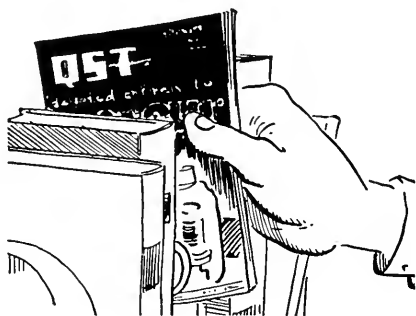
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RADIO RELAY LEAGUE  
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.30 net and ELW the 6:30 session. The THIN will continue as last year. QMN certificates were issued to the following stations for the '54/'55 season: SIB, SRK, WGU, and HSG. Some of the gang still are sending clippings and reports about the successful Field Day last June, so it still must be worth talking about. According to the latest *MOCD News Letter*, the RACES plan for Michigan has been printed and circulated to the e.d. organization. Gary will do likewise as soon as suitable meetings can be scheduled to discuss details with the Area ECs and their lower echelons. From this, it looks like this winter will see the RACES plans go into effect. Keep the AREC applications coming in to Gary or myself. Remember the Central Division ARRL Convention in South Bend on Oct. 15-16. Let's visit our neighbors and join the fun. I'll see you there. I'm sorry to have missed the picnics because of vacation and that's why this report is a bit short. Traffic: (July) W8NUL 95, NTC/8 69, QOQ 65, LLP 58, NOH 43, IJ3 38, HKT 30, RTN 29, SJF 27, FX 25, SCW 22, IV 14, RAE 12, PHM 11, HSG 10, MGQ 10, FGB 8, PDF 7, TBP 3, ZHB 3, DSE 2. (June) W8RTN 25, KID 10.

**OHIO**—SCM, John E. Siringer, W8AJW—Asst. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8JNF; and E. F. Bonnet, 8OVG. SEC: UPB. RMs: DAE and FYO. PAMs: EQN and HUX. The Buckeye Net is working in conjunction with the W8 QSL Manager, NGW, in transmitting reminder messages to W8 amateurs who have QSL cards but no envelopes at the Bureau. HOH was heard in Oklahoma on 144 Mc. MGC has a new all-band V-37 antenna. PS informs us that three new Novices are in Hubbard. W8NUJG recently suffered a severe heart attack. May he have a speedy recovery. BOJ erected new antennas for all bands, including a 20-meter beam. The Toledo group had its best Field Day with 138 registering at the site. GZ, our outstanding OO, reported 34 amateur rule infractions during the month of July. He also identified three commercials operating in the 20-meter amateur band. JHH had the misfortune of having his station struck by lightning. We're pleased to learn that LMB is doing nicely following surgery. AL reports RNL, SWB, TNK, TGZ, and UNE passed their General Class exams. QXH received his 20-w.p.m. CP sticker. DSX, SRN Manager, states that Ohio was represented 37 times during July. Correction: The NVJ mentioned in August QST should have been MVJ. Toledo's *Shack Gossip* relates that new editors will replace HUX and HWX. These gals have done a splendid job during the past several years even to the extent of publishing tempting recipes. WE and OTK (OM and XYL) are moving from Findlay to Van Buren. Hamilton's *Feedline* mentions that OUD has a new 20-meter beam; ex-UJF is now living in Lake Success, N. Y.; RZA recently was released by the Air Force; and W8CYD is the newest licensee in town. The Canton group experienced its best Field Day and plans already are being made for 1956. We regret to record the passing of UZU, past-president of the Canton Amateur Radio Club. The Hocking Valley *Key Klax* reports that the following are members of the Club's "phone net": HPP, LGR, NAJ, GXR, DCX, RRQ, CSB, and EEQ. HPP is NCS. Springfield's *Q-5* informs us that Field Day was quite successful despite a shortage of operators and heavy rain. The OVARA's *Ether Waves* lists the Club's top DX men regarding countries worked: JIN-250, BRA-248, BTI-246, FGX-239, JJW-215. Not bad for a small town! Eastern Ohio's *Ham Flashes* states that QYR's son received the call W8SCDX; HLX, of Niles, has a new 60-foot tower; JOD is attached to WFMJ's staff; EKX, MJI, and MUX are attending Valparaiso Tech.; HDC has moved from Youngstown to Leetonia; WOL, of Warren, is now on 6 meters; W8SWAN is the newest call in Ashtabula; KA2WC's home is in Damascus, Ohio; and the Youngstown-Mahoning County C.D. drills are being held Mon. evenings on 29.5 Mc. Traffic: (July) K8FCJ 353, W8DAE 298, MVJ 263, AMH 151, ARO 139, IIR 104, AL 46, AJW 45, HNP 45, RO 45, HPP 32, AJH 22, QXH 22, WLM 21, HUX 16, BEW 12, JMD 12, W8SWTO 12, W8QHW 11, LMB 9, EQN 8, ET 8, GZ 8, PBX 8, PGQ 8, PIJ 8, CTZ 7, HFE 6, OPX 5, LGR 4, RZ 3, WYL 3, SBH 2, STR 2, URN 2, VTP 2. (June) W8ZAU 9, PBX 8, ILC 6, MGC 6, QIIW 3, DG 2.

### HUDSON DIVISION

**EASTERN NEW YORK**—SCM, Stephen J. Neason, W2ILI—SEC: RTE. RMs: K2BJS and TYC. PAMs: GDD and IJG. Because of severe sun poisoning of both feet, your SCM was unable to make the June report in this column. I am now fully recovered and spending my vacation as I write this on a beautiful northern lake. K2EIU will attend R.P.I. this fall and will be active from SZ. K2JWM will be portable in Ridgefield, Conn., and with the help of IRT will keep regular skeds with OM HM. K2HVN will vacation in Maine. Bill will take along his new modulator and 25-watt rig. K2GMV will tour Europe and will try to meet some of the boys he has worked over there. K2IKH passed his General Class exam and is busy setting up shop. K2LAD recently got his General Class and driver's licenses. Put 'em together and you'll find a 10-meter mobile rig in Hank's bomb. K2EDII has a new three-element

(Continued on page 90)





## A PAIR OF EIMAC 4X250B's— the easy, modern approach to a compact one-kilowatt CW and SSB rig

You'd be amazed how easy it is to build a one-kilowatt rig using Eimac 4X250B radial-beam power tetrades. Each of these bantam tubes handles 500 watts input with only 2000 volts on the plate. A pair in the final amplifier provides a kilowatt with the power supply and transmitter combined taking only a fraction of the space required for an old-fashioned kilowatt rack.

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	Class-C CW or FM Phone	Class AB <sub>1</sub> RF Linear
D-C Plate Voltage	2000v	2000v
D-C Screen Voltage	250v	350v
D-C Grid Voltage	—90v	—50v
D-C Plate Current	250ma	250ma*
Zero Sig D-C Plate Current	—	100ma
D-C Screen Current	25ma	15ma*
Peak RF Grid Voltage	115v	50v*
Driving Power	2.8w	0w
Plate Power Input	500w	500w*
Plate Power Output	410w	325w*

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An Eimac air system socket with built-in screen by-pass condenser provides optimum amplifier circuit stability and cooling arrangements for the 4X250B.

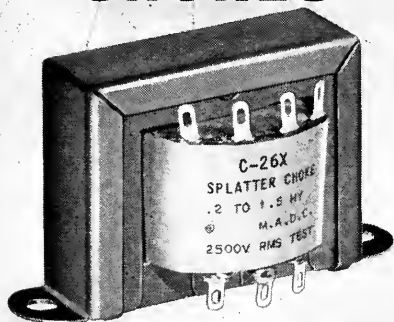
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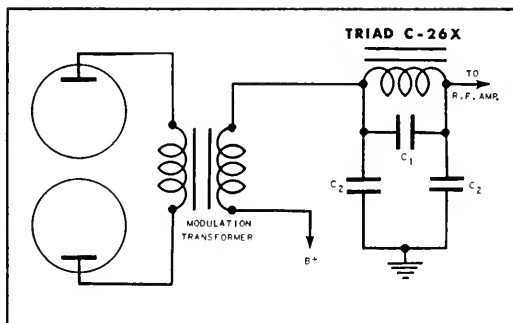


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beam on 14 Mc. Jon has credit for WAC and eighty countries. Congrats to the 2RN 'Phone Net; the gang celebrated its second birthday with a picnic. LRW will fire up his new 20A and 500-watt linear amplifier, and to make things complete Marce will include more 50-foot masts and antennas for all bands including 144 Mc. this fall. RTE has returned from his tour of Europe. We trust that Ted has enjoyed a well-earned vacation. K2EHI has a new Elnac and receiver for the mobile. Members of the Ulster County Mike and Key Club assisted the Hudson Valley Firemen's Convention during a recent parade held in Kingston. Mobile communications were furnished by VAQ, SIF, PGE, and YOK. K2DRV acted as control from C.D. Headquarters station K2JBH. K2EKE has a new 813 final. SSV and K2CJW have new Heathkits (DX-100) ready for the fall. Traffic: (July) W2LRW 34, K2EDH 31, EKE 29, JWM 29, EHI 20, BE 6. (June) K2JWM 23, EDH 19, EKE 17.

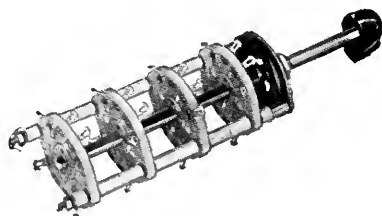
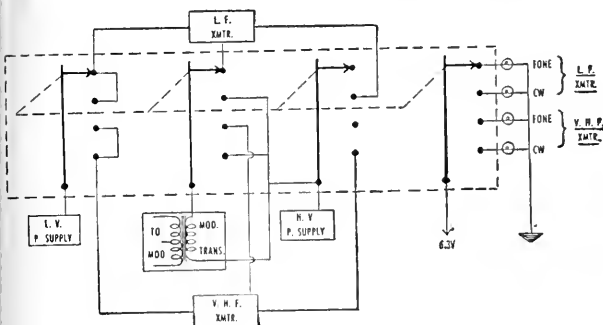
**NEW YORK CITY AND LONG ISLAND** — SCM, Carleton L. Coleman, W2YBT — Asst. SCM: Harry J. Dannals, 2TUK. SEC: ADO. PAM: NJL. RM: VNJ. It has been necessary for LPJ to resign as RM for 2RM because his job now requires more traveling. The section will miss his excellent traffic work and we hope he will be able to return to the Net soon again. ADO reports that 10-meter AREC activities were almost exclusively devoted to hidden transmitter hunts during the summer months. JOA reports that TAN (3630 kc. at 1830 EST/EDST) invites old-timers as well as teenagers to participate. NJL and his XYL, KN2JHQ, attended the NYSPETN picnic at Syracuse. K2GHS/1 kept up his Observer work while at camp in Becket, Mass. K2JEB is now pushing a big signal on the NLI Net with a 4-125A final. LGK reports that the Tu-Boro Club is planning another mobile "caravan" for early October. Despite the summer recess, AEE remained active in the NLI Net, with K2JFZ at the mike and key. IVA, PF's son, traveled in Europe on a motor scooter and visited some of the DX stations. K2DDK works 80 meters with Lysco 600S and 75A-1. He would like to know if anyone is interested in playing chess on 80-meter c.w. K2ICU now has a 300-watt rig. K2AVB completed a 6-meter transmitter for fixed or portable operation. K2EQH has broadened his bulletin work to include 2 meters as well as 20. K2GRE now is on 2 meters with an 832A rig. K2AMP has the Amityville Memorial HS station. K2GKQ, ready to participate in the Suffolk County RACES program. Ex-JXM, now 5JXM in Oklahoma, is active on the OLZ Net and sends regards to the NYC-LI gang. JGV/1 found DX-hunting good from his summer camp location in Massachusetts. ION/2, at Hicks-ville, is running 125 watts on 144 Mc. JOA and K2DDK are trying for YLCC. The section had a good turnout in the July 'phone and c.w. CD Parties. Let's see even more activity in October! GXC vacationed in W3-Land and found that his low power really gets out with a good antenna. KN2PBF is a new call in Oceanside. NIP qualified for a net certificate for his activity in NYSPETN. ADO's XYL now is active on 144 Mc. with a 2E26 rig. With this column, TUK concludes his work as Asst. SCM. It has been a pleasure assisting YBT in his work and the experience will help me to serve the section better in the future. Best wishes to Carl as he leaves office. These are his parting words to the section: "This is the last column with YBT as SCM. TUK takes over for the next two years. Many thanks and my sincere appreciation for your cooperation during my term. May I ask your assistance likewise for the new SCM. 73." Traffic: (July) W2JOA 184, JGV/1 116, WFL 96, NJL 70, K2GHS/1 54, W2IVS 41, K2JEB 29, W2LKG 16, AEE 14, TUK 10, K2AMP 7, KXZ 7, W2PF 6, VDT 6, GXC 4, K2ABW 2, DDK 2, HYK 2, ICU 2. (June) W2WFL 83, GXC 49, MUM 25, K2GHS/1 19, W2AEE 15, VDT 13, K2GRE 6. (May) W2JOA 11.

**NORTHERN NEW JERSEY** — SCM, Lloyd H. Manamon, W2VQR — SEC: IIN. PAM: CCS. RMs: NKD, EAS, and CGG. The 2nd Call Area TCPN outing was held in Middletown, N. J., with K2GTX as host. Those attending were K2BWP, BWQ, BWR, GML, EWP, JKA, CLL, IKS, W2HTD, KEB, KFV, QJO, YRW, ZOL, and SJO. Could be that in the rush we may have left someone out. If that is the case please excuse it. GUV is back with us again after a long tour of duty with the Army in different parts of the world. He is now at Ft. Monmouth and will be on the air from his quarters there. His former calls were W4GVU and KA2DX. YVQ has been QRL while on the road and on vacation. NJN operated six days a week in spite of summer vacations. EAS is doing a fine job as RM keeping up summertime interest. By the way, EAS just received an EAN certificate. K2HXP is on 50 Mc. He needs a copy of Jan. 1946 QST. Can anyone help? K2IKS is planning to operate portable in VE-2 and VE-3-Land this fall. BRC is rebuilding for the fall season but got in the July CD Party just the same. CVW now is settled in a new QTH. He has no antennas as yet but ran up 23,760 points in the CD Party with a wire strung in the attic. GVZ has been hit by the summer lull but promises to be back full strength come the fall season. EWZ has a new 33-ft. vertical. A new club in the section is St. Peter's Prep. Radio Club, with headquarters at 144 Grand Street, Jersey City. The Club was started in November of '54 with no one having any type of radio license. Presently there are 3 General Class and 8 Novice licensees as a direct result of the club activities.

(Continued on page 92)

# MALLORY HAM BULLETIN

## Switch Common Power to several RF Transmitters with Mallory "Hamband" Switches



Mallory #1600 Series Rotary Switches, better known as "Hamband" switches, were designed especially for coil switching in high frequency transmitter service. However, the heavy, wide-spaced contacts, high quality ceramic insulation, and positive indexing which make these switches so desirable for use in transmitter plate circuits, also, give them exceptional capability for many other switching functions.

For example, the diagram above shows how a #164C (4 section "Hamband" switch), connected as a circuit changer, permits operation of two separate RF chassis from common power supplies and a single modulator. VHF operators in particular, who operate separate rigs above and below 50 megacycles, will recognize the economy and convenience this arrangement adds to such a station. With contact carrying ability of several hundred milliamperes, and with 1000 volt insulation, this switch is entirely adequate for transmitter powers up to 100 watts.

The circuit shown was devised by a dyed-in-the-wool VHF man to permit the addition of a low frequency RF unit to his existing VHF transmitter, and still use only the common power supplies and single modulator shown. However, there is no reason why a dyed-in-the-wool *low frequency* man couldn't make the change the other way 'round, and let the #164C switch help him explore the possibilities of VHF operation with a minimum expenditure of funds for new gear.

When using the #164C for this application, the usual high voltage wiring precautions should be observed, even though the exact circuit arrangement may be modified to suit individual requirements. The one shown has the indicator-lamp circuit located adjacent to the panel, the low voltage supply next, then the high voltage, and last the modulator transformer shorting section for CW operation. The physical location of the switch in relation to the power supplies, modulator and RF chassis is not important, and may be placed for maximum convenience. The circuit shown has the switch located within the modulator housing. Separate input and output sockets for each piece of equipment are mounted at the rear of the modulator.

The convenience and efficiency added by this circuit has been reported by its user to be most satisfying. Why don't you investigate the money saving possibilities Mallory rotary switches offer? Your Mallory distributor will be glad to help you select the right one.

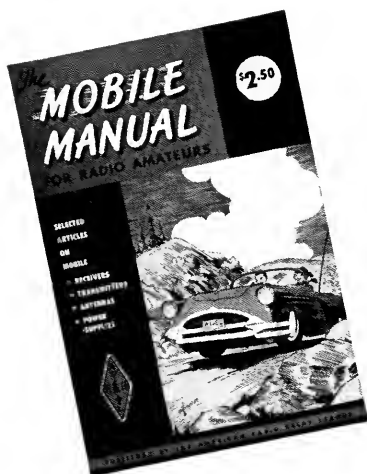
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**MALLORY**



**L**ATEST addition to the family of widely-read ARRL publications, this manual is a useful and informative guide to mobile radio. It is a collection of many articles on tried and tested equipment, presented in an orderly fashion for easy reading and reference.

**C**ONTENTS include a section on receiving, with valuable information on automotive noise suppression; a group of articles describing over 30 different mobile transmitters; sections on mobile antennas and power supplies; and excerpts from FCC's regulations governing mobile operation. The Mobile Manual for Radio Amateurs should be on the bookshelf of everyone interested in the installation, maintenance and operation of mobile stations.

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**AMERICAN RADIO**

**RELAY LEAGUE**

WEST HARTFORD 7, CONN.

The club call is K2OQJ. The big news for the month of July is that two more new General Class licenses have been obtained — K2LWX, age 14, and K2LSU, age 16. The Club desires to maintain skeds with other high school clubs during the coming fall season. Contact K2LSU, the secy., for skeds. Other officers are K2KRE, pres.; KN2KUD, vice-pres.; and K2KOS, moderator. This is a splendid example of what can be accomplished by group activity. It is suggested that readers who desire to get started in ham radio contact their local club. If you do not have the address, contact the SCM and you will be referred to the nearest club in your neighborhood. K2CHI is erecting a new three-element 20-meter beam. K2IPR is on 144 Mc. with a new Gonset final. K2ICE is QRL with seasonal business going strong and has no time for ragchewing. FCC and BRC were heard mobile on 144 Mc. from Eagle Rock. K2DHE is the chief antenna erector in Monmouth County. He specializes in swinging aloft from 100-foot towers with sixteen and thirty-two elements surrounding him. Traffic: W2EAS 137, K2GAS 109, GFN 53, W2HTD 28, CCS 26, K2IKS 21, BWQ 18, CHI 2, W2NIY 2, CVW 1.

## MIDWEST DIVISION

**IOWA** — SCM, Russell B. Marquis, W0BDR — The Cedar Rapids Club was host to the 75-meter 'phone net picnic, at which 144 licensed Iams were present with a total attendance of 255. The Waterloo and Creston Clubs also had picnics. SLC has a new KWS-1 and 75A-4. K0BZF and K0CCZ have General Class licenses. K0CCZ hopes to operate from Turkey while on duty there with the Navy. BBZ is home on leave from the Navy. BVE is on leave from the Air Force and will be stationed at Sioux City Air Base. SCA has a new Elmac mobile rig in a new Buick. CGY is on vacation in Ohio. FMX is vacationing in Colorado. UCE and SQE received ORS appointments. PZO made second high traffic score for the second month. HMM is starting code classes for General Class aspirants. LPK has returned to Cedar Rapids after several years near Chicago and has rejoined TLGN. LGG did a fine job as liaison station to TEN, substituting for BDR while he was on vacation in Wyoming. BDR attended the Fort Dodge and Fairfield Club meetings. QVA received a certificate for perfect copy of the Armed Forces Day message on May 21st. FWF is the newest member of TLGN. The Dayenport Club is building a Novice station in addition to the kw. rig. SQE spent a week in Buffalo, N. Y., at a radio and TV school. VEM has received a WAC certificate. Traffic: (July) W0SCA 1103, PZO 856, BDR 543, CZ 319, SQE 81, LJW 76, BLH 51, LGG 41, QVA 40, TGQ 25, NGS 13, IUY 5, PAM 5, SRQ 5, KJN 4, PUR 4, UTD 4, NYX 3, FDM 2, IHC 2. (June) W0SQE 45 TGQ 33.

**KANSAS** — SCM, Earl N. Johnston, W0ICV — SEC: PAH. PAM: FNS. RM: NIV. VGE received her General Class ticket July 15th. Congratulations. Becky also has the honor of being the only one sending in a bit of news for station activities this month. Traffic: (July) W0NTY 259, BLI 238, MXG 130, YFE 31, FNS 25, LOR 22, SAF 20, YVM 19, ECD 18, EOT 16, FDJ 16, TNA 15, VGE 14, RXM 9, WJB 8, WN0XJU 5, KN0BZO 1. (June) W0NFX 13, LOW 9. (May) W0QGG 47, DEL 17, WWR 9, UAT 4.

**MISSOURI** — SCM, James W. Hoover, W0GEP — SEC: VRE. PAM: BVL. RM: OUD and QXO. VTF has added a VFO to his rig. SAK appeared on KRCC-TV and discussed amateur radio. OMM's son has returned from Alaska. K9FCT wants traffic schedules on any band, 'phone or c.w. TCF is moving to Minneapolis. GCL installed a 75-meter mobile and plans to use it during a vacation to Colorado. The Southwest Missouri Amateur Radio Club had stations operating in Springfield for reporting the arrival of airplanes during the Powder Puff Derby. Participants were HUI, EBE, QWS, SPU, LQC, ICW, CZC, GBJ, and HGD. EBE is handling RACES applications in the Springfield Area. Traffic: (July) W0CPI 866, GAR 398, VTF 278, GBJ 169, SAK 164, OMM 144, HUI 104, RTW 99, K9FCT 72, W0UOD 70, MRQ 46, CKQ 34, VWZ 26, BVL 22, KIK 15, IIR 13, VPQ 8, BUL 6, FLN 6, EBE 5, KA 5, TCF 1. (June) K9FCT 148.

**NEBRASKA** — SCM, Floyd B. Campbell, W0CBH — Asst. SCM: Tom Boydston, 0VYX. SEC: JDJ. PAM: EUT. KN0AKR, AKV, AKW, BBC, BJT, and BNP, at Scottsbluff, have formed a new net with KN0AKW as NCS. It is called the S.A. Net and meets at 8 p.m. MST every Mon. and Thurs. on 3735 kc. Relaying and delivering messages to the Panhandle is its goal. HMN is listening on 2 and 6 meters and building a power pack for 6 meters and vertical ground-plane antenna. DDT is the regular Mon. NCS on TEN and NCS for the Nebraska C.W. Net 3 nights a week. UOV was mobile on his vacation in South Dakota. BZS has returned to North Platte from Salt Lake City. 7MYD, in North Platte as general foreman for the Union Pacific, has been transferred to Hinkle, Ore. KXD sure is going to have a nice shack when he gets moved into his new home. IBA can be heard operating from McCook now. CBH has just about finished his monoscope. ERM is the new EC at North Platte. More ECs are urgently needed for all parts of Nebraska. Please select one for your club and request your SCM to make the appointment. Another

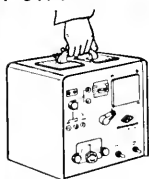
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# 6 METER

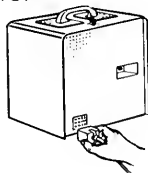
## "Communicators"

### PORTABLE..

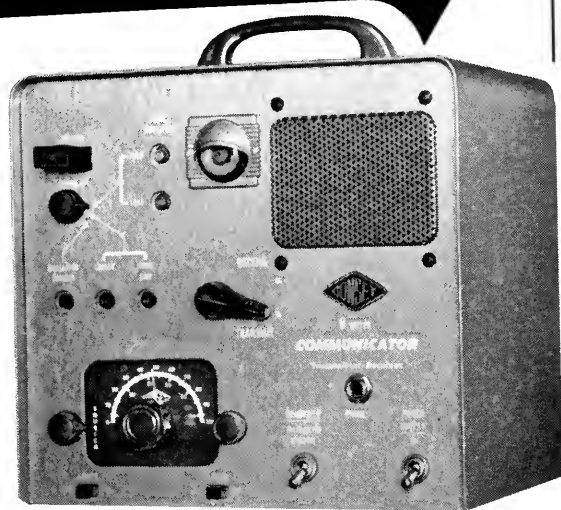


9-1/4" high,  
10-3/8" wide,  
7-3/4" deep.  
Weight approx.  
20 pounds.

### AC/BATTERY



Merely use appropriate plug-cable for AC or DC operation.

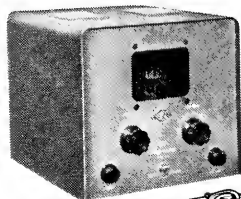


### 6 METER LINEAR RF POWER AMPLIFIER

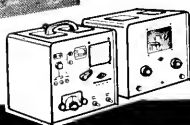
Add to your 6 meter Communicator, (or other 6 meter, 5-6 watt modulated equipment) to increase POWER OUTPUT to 50-60 watts. Simple to adjust, foolproof in operation. Uses push-pull 826 triodes, (supplied) with forced air cooling. Has heavy-duty 115V AC power supply. Antenna relay is built-in.

Models available on special order for commercial, government, aircraft frequencies from 50 to 150 mcs. Your inquiries invited.

6 METER RF LINEAR.....Net 149.50



Same size and style  
as Communicator...



Now--6 meters in the desirable, widely accepted 2 meter Communicator package. Here is a complete station, suited equally to fixed or portable operation, with performance comparable in every respect to larger sized communications equipment suitable only for fixed station use.

The excellent receiver features "Cascode" R.F. for high sensitivity, dual conversion for image rejection and added selectivity useable on 6 meters. Tuning range includes 49 meter BC band, a real assist in spotting band openings. Gonset noise limiter and adjustable squelch make worthwhile contributions to overall receiver performance.

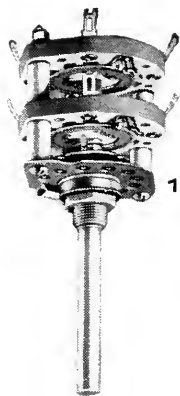
Transmitter uses 2E26 final to provide power output of 8-10 watts with high level modulation. Power supply is self contained, universal for 6 volts, (or 12V) DC and 115 volts AC.

De Luxe Model--6V DC/115V AC---No.3049---Net 229.50

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1 5/8" in diameter

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for high voltages

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Heavy Steatite spacers for high breakdown to tie rods (ground). 90° Index for greater spacing between contacts. Available 1 pole, 4 positions, up to 5 sections per switch.

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Eyelet and rivet construction cannot turn, twist, or become loose.

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Address

City  Zone  State

bang up picnic was held at Lincoln Park in Grand Island. That G.I. gang sure can put on good picnics. Traffic: W0ZJF 210, DDT 146 QHS 34 FXH 32, HTA 26, MAO 21, ERM 18, K0WBF 11, W0FRS 10, OOX 8, ORW 8, PQP 8, LZL 7, AGP 6, PNS 4, ZOU 4, AFO 3, LWK 3, NHS 3, OCU 3, AEM 2, BEA 2, DJU 2, KLB 2, HQN 1 UJK 1, VGH 1.

## NEW ENGLAND DIVISION

CONNECTICUT — SCM, Milton E. Chaffee, W1EFW — SEC: LKF, PAM; LWV, RM; KYQ, MCN and CN 3640 (0645 and 1845); CPN 3880 (1830); CTN 3640 (Sun. 0900); CEN 29,580 kc. We are now well into a new traffic season. C.w. traffic men are urged to meet CN or MCN, originate and handle traffic, and send a monthly report to the SCM by the 5th of the following month. CPN will welcome the 'phone traffic men daily or Sun. at 1000. CTN is a training net for those whose c.w. speed is below that customary on CN but who want to learn how to handle traffic. ORS and OPS appointments are available from the SCM to all who qualify. ANU is chasing DX on 20 meters with 35 watts, expects a new 3-band rhombic soon, and seeks OO appointment. A fine report was received from EJH, Bridgeport EC, on the activities of BRACES. There are four active 2-meter nets for the Fairfield County gang. UIZ now is with RCA in New Jersey but finds time for v.h.f. fun. RAN, in the Army at Fort Bragg, bemoans weak CN signals for QNI; he may soon be on K4WEE (MARS). BDI enjoyed VE1 mobile and CN QNI from northern points. NFG has

## C.W.A. EIGHTH ANNUAL CONNECTICUT QSO PARTY OCTOBER 22-23, 1955

All Connecticut amateurs are cordially invited to take part in the Eighth Annual Connecticut QSO Party to be sponsored by the Connecticut Wireless Assn., Inc.

Rules: (1) The party will begin at 5:00 P.M. EST October 22nd and end at 11:00 P.M. EST October 23rd. (2) Any and all amateur bands may be used, and either 'phone, c.w., or both. C.w.-to-'phone and cross-band contacts are permitted, but no extra credit is allowed for such QSOs. (3) The general call will be "CQ CN" on c.w. and "CQ Connecticut" on 'phone. (4) The same station may be counted but once regardless of band. Mobile, portable and home stations covered by the same station license all constitute the same station. (5) Exchange names of town areas. (6) Score one point per contact; multiply contact points by number of town areas worked for final score. (7) Reports must show times of QSO, call of stations worked, town area of station worked. All reports must be postmarked no later than November 15th and should be sent to Tony Dorbeck, W1YNC, 1650 Stanley St., New Britain, Conn. (8) Special recognition to the high scorers and to the highest-scoring Novice. All decisions of the C. W. A. Contest Committee will be final.

Here is an opportunity to see how many Connecticut stations you can work in a 30-hour period. Get on the air October 22nd and 23rd and meet the gang around your section!

been mobile on 10 meters down Florida way visiting 4FH. GIX and TD are covering all OBS skeds and GIX adds the only OO report. An FB bulletin was received from the Middlesex RA. How about other clubs? EFW mobilized on 2 meters in Maine and worked five states during the opening July 29th. Our section space in QST is mighty hard to fill without your monthly reports. How about more news of clubs? Note to ARRL appointees: Watch your certificate expirations and forward certificate to the SCM for renewal on time. Traffic: (July) W1YBH 233, NJM 90, YNC 90, AW 82, LIG 81, CUH 77, RGB 41, LV 31, TYQ 27, BDI 14, EFW 13, KV 10, RAN/4 6, UED 6, EJH 5. (June) W1RAN/4 14.

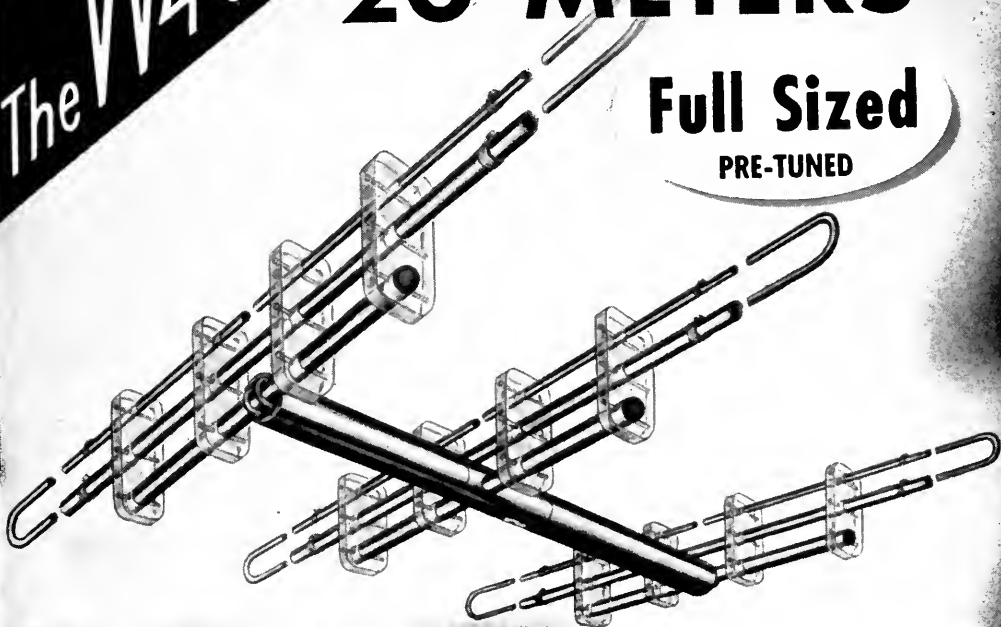
MAINE — SCM, Allan D. Duntley, W1BPI/VYA — SEC: TVB, PAM; TWR, RM; EFR. The Pine Tree Net meets on 3596 kc. at 1900. The Barnyard Net meets Mon. through Sat. at 0800-0930 on 3960 kc. YVN is the new net manager. The Maine 'Phone Net meets Mon. through Sat. 1700-1800 on 3940 kc. The Sea Gull Net will replace the Maine 'Phone Net with the return of Standard Time. We wish to thank all who have made the Maine 'Phone Net a success these summer months. Many of the boys and girls were very happy to meet the "Earl of Crow Island," ZE, and "Lady Margaret" while they were sojourning on Heartbreak Ridge. VXU and NXX have the solution to finding hidden transmitters. ZAH has a new mobile mike, won at the transmitter hunt at the annual Casco Day. Next year we hope you fellows won't keep BYK waiting so long for a

(Continued on page 96)

**The W4GL**

# All Driven Rotary Antenna **20 METERS**

**Full Sized**  
**PRE-TUNED**



**M E A S U R E D**  
**FORWARD GAIN**  
**11.8 DB**

**FRONT TO BACK RATIO**  
**40 DB OR BETTER**

- Impedance match — 52 ohms
- Element length — 33 feet max.
- Boom length — 24 feet
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- All aluminum construction
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- S W R — 1:1 at resonance  
1.3:1 at band edge 14,000—14,400
- Quick rig assembly

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Catalog No.	Height	Width	Depth	Amateur Net
C-1584	6 1/2"	7-1/16"	7-5/16"	\$3.30
C-1585	6 1/2"	9-1/16"	7-5/16"	3.75
C-1586	6 1/2"	11-1/16"	7-5/16"	4.15
C-1587	8"	8-1/16"	8"	3.99
C-1588	8"	10-1/16"	8"	4.41
C-1892	8"	13-1/16"	8 1/2"	4.99
C-1893	10"	18-1/16"	10 1/2"	6.99
C-1894	8"	14-1/16"	8"	4.79
C-1896	9"	18-1/16"	8 1/2"	6.84

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Five sizes of these sturdy racks are now available for your convenience. NOW ALL STANDARD RELAY RACKS MAY BE OBTAINED IN LIGHT GREY HAMMERED FINISH WITHOUT EXTRA CHARGE.

Catalog No.	Height	Panel Space	Amateur Net
RR-1263	35 1/2"	31 1/2" x 19"	\$18.48
RR-1363	38 1/2"	36 1/2" x 19"	18.90
RR-1264	70 1/2"	66 1/2" x 19"	21.06
RR-1364	73 1/2"	71 1/2" x 19"	22.05
RR-1366	81-7/64"	77" x 19"	26.34



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smoke. Thanks to ANI (Glastonbury, Conn.) for his assistance on that day. You guys and gals, don't forget to send in your certificates for endorsement. Also, anyone interested in new appointments, get in touch with your SCM, SEC, PAM, or RM. 7NXY showed the boys what call letter license plates look like. Now is a good time to affiliate with the radio club in your area. There are many good up-and-coming clubs in Maine. Anyone noticed a peach-colored Plymouth parked at or near 27 Canabas Ave., Waterville, Maine? Traffic: WILKP 99, SME 73, EFR 61, UDD 42, BX 21, TWR 21, YVW 21, LYR 14, QUA 12, BAD 11, BBS 9, DNV 8, NXX 4, OTQ 4, YVN 4, BDP 1.

**EASTERN MASSACHUSETTS**—SCM, Frank L. Baker, jr., W1ALP—New appointments: THO, QLT, and BPW as OOs; BPW as OBS. Appointments endorsed: RQZ Abington, LJH Plymouth, LPM Natick, MBQ Vineyard Haven, as ECs; BY and MX as ORS; PXH as OO; MX as OPS; CTW as OES; RQZ as OBS. New officers of the Middlesex Amateur Radio Club are FZG, pres.; CWH, vice-pres.; FQC secy.; COL, treas.; DLF, chief eng.; FQG act. mgr. Heard on 2 meters: RCY, RFN, and QKJ. RGR is on 75 meters. ASG has a new son and WK is now a grandpa. YHK has a new son. SRG is active in several nets. JJY is moving to Baltimore to take a job with Westinghouse. THO is busy with DX on 6 meters, also mobile. MEG is building a new 6-meter crystal converter and bought a Techcraft 2-meter crystal converter and six-element 2-meter beam. The South Shore Club held a summer meeting. The Braintree Club held a meeting. UKO has a sticker for all 67 counties of WANE and has WAM, BPW has a 6146 on 80-meter c.w. WU went to Maine for 2 weeks and took the rig with him. AKN is on 2 and 80 meters. QLT has been doing some ground-wave studies on 21 and 28 Mc. RM QMU had a vacation in New Hampshire. PIW went to Vermont. LNU is working in Maine. UG had an operation. UKA is away most of the time. SXD is back from DL4-Land. Newton gave a c.d. drill for Alderman. WN1FIL is a new YL in Dorchester. CTW has WAS for 15-meter c.w. AVY had an operation on his throat. WN1DIY worked C/Land with a 30-watt Heathkit. CDO's father supplied South Eastern Massachusetts Club's location with a black top walk. WNs FJI, FJQ and FMG all have Heathkit AT-1s. New officers of the Bedford Radio Club are YFP, pres.; YYI, vice-pres.; Geo. Kozlowski, treas.; ZSG, secy. The Club had over 75 at its annual club supper. QJB is on 10 meters. WEW is on 2 meters. The Bedford Club was out on Field Day with YYI, YWY, YFP, DTN, QJB, KJO, NAD, NDI, RSY, and ZSG operating. The Billerica C.D. 10-meter Net meets on 29.12 Mc. Mon. nights with WYY as net control. DEE has a BC-474 on 80 meters. EIQ is mobile on 10 meters. BFV wants help with his TNS. DTA has a new home in Concord. KJO has a Lyseo mobile rig. RSY, NAD, and NDI received awards from the Bedford Club for their c.d. work. WN1EIT, the XYL of ZSG, passed her Novice Class exam while in the hospital. YYI had 750 watts s.s.b. 2IVT came to the Club's supper. WN1ETX is very active on 3703 kc. AKN's boy, 4SRA, now is living in Hingham and has a sked on 80 meters with him. ALP and his XYL, CLF and his XYL, VYH, and VYI attended the outing of the Cape Cod & Island Net at West Dennis. Mr. Tennenbaum, of the Weather Bureau in Boston, spoke on hurricanes and the help that the amateurs can give. Officers were reelected for another year at this annual meeting. Traffic: (July) KIUSA 266, W1EPE 148, UO 111, WSN 107, IBE 43, BPW 19, WU 9, AVY 8, QLT 4. (June) W1AKN 3

**WESTERN MASSACHUSETTS**—SCM, Osborne R. McKeraghan, W1HRV—SEC: RRX. RM: BVR. PAM: QWJ. The WMCW Net meets on 3560 kc. Mon. through Sat. at 1900 EDST. The WM Phone Net meets on 3870 kc. Wed. at 1800 EDST. MNG has been appointed c.d. director of Agawam. Also in Agawam, OBQ is communications chief and VNH assistant. HRV is now Radio Officer for Easthampton. AJV, Webster, is a new OBS. ZUU is the new president of the Central Mass. Amateur Radio Assn. and is doing a fine job with the c.w. traffic nets. BKG, LPQ, and DPY are working on RACES plans for their towns. A well-attended meeting of Area 4 Radio Officers was held in Chicopee to talk over plans and progress. Much has been accomplished and area and sector organization is progressing rapidly under the direction of Area RO ICW, CO EVZ, and Director Newman. AZW is nearing DXCC. BYH received WANE and is now working DX on 20-meter c.w. Communications for the Powder Puff Derby, which ended at Barnes Airport, Westfield, were ably handled by amateurs. Eunice Gordon, UKR, national chairman of the radio network for the Derby, did a fine job of organizing complete coverage for the route of the fliers. At this end of the route four transmitters were in operation about 18 hours a day for 5 days, one on 20, one on 75, and two on 2 meters. Volunteer operators and owners of equipment used included the following: CLW, DGJ, YYT, KUE, KUL, CSR, TPH, MNG, VNE, VNH, QUQ, CGY, OBQ, TZV, WDK, ZIO, ULY, MSN, SRM, AJX, WDW, 2IGV/1, FFV, KEB, and 8KSM. Much credit is due these operators and the HCRA for the time and effort put in to furnish a splendid job of communications: Traffic: (July) W1ZUU 126, BVR 97, WEF 95, TAY 37, MNG 32, DVB 6, UVI 6, HRV 5, JAH 4. (June) W1ZUU 22, DPY 3.

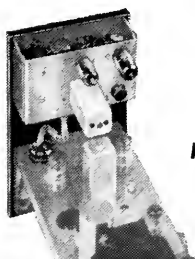
(Continued on page 98)



# NEW MULTIPHASE "Q" MULTIPLIER

- Peaks Desired Fone or CW Signal
- Nulls Out Interfering Carrier up to 50 DB.
- No Loss in Speech Intelligibility

- No Insertion Loss — New Two Tube Circuit
- Special High "Q" Pot Core Inductor



**MODEL AQ**



**MODEL DQ**



**MODEL B SLICER**

## CONVERTS MODEL A SLICER

Plugs into Model A accessory socket, converting it into a Model B. New front panel and controls provided. Enjoy all the advantages of "Q" Multiplier selectivity on CW, AM & SSB with your present Model A Slicer.

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Kit ..... \$22.50

## FOR AM, CW, SSB OPS

Desk Model "Q" Multiplier for use with any receiver having 450 to 500 KC IF. In attractive, compact case with connecting power-IF cable. Power supplied by receiver. Also provides added selectivity and BFO for mobile SSB or CW reception

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## BUILT-IN "Q" MULTIPLIER

Upper or lower sideband reception of SSB, AM, PM & CW. For use with any receiver having 450-500 KC IF.

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Same as Model B but less "Q" Multiplier  
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### BROAD BAND LINEAR AMPLIFIER

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### SINGLE KNOB BANDSWITCHING 10-160 METERS

- Single 813 in Class AB<sub>2</sub>. Approx. 2 watts effective or 4 watts peak drive for 500 watts DC input.
- New band-pass couplers provide high linear efficiency: 60-65%.
- Designed for 50-70 ohm coaxial input and output.
- Built-in power supply. Bias and screen regulation. Automatic relay protection.
- Exclusive metering circuit reads grid current,

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- Choice of grey table model (17 $\frac{3}{8}$ " W, 8 $\frac{3}{4}$ " H, 13" D) or grey or black rack model.

Wired, with tubes ..... \$349.50



**MODEL 20A**

- 20 Watts P.E.P. Output SSB, AM, PM and CW
- Bandswitched 160 — 10 Meters
- Magic Eye Carrier Null and Peak Modulation Indicator

Choice of grey table model, grey or black wrinkle finish rack model  
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### NOW IN BOTH MODELS

- Perfected Voice-Controlled Break-in on SSB, AM, PM.
- Upper or Lower Sideband at the flip of a switch, with 40 DB. suppression.
- New Carrier Level Control. Insert any amount of carrier without disturbing carrier suppression adjustments.
- Talk yourself on frequency.
- Calibrate signal level adjustable from zero to full output.
- New AF Input Jack For oscillator or phone patch.
- CW Break-in Operation
- Accessory Power Socket.



**MODEL 10B**

- 10 Watts P.E.P. Output SSB, AM, PM and CW.
- Multiband Operation using plug-in coils.

Choice of grey table model, grey or black wrinkle finish rack model. With coils for one band.  
Wired and tested ..... \$179.50  
Complete kit ..... \$129.50

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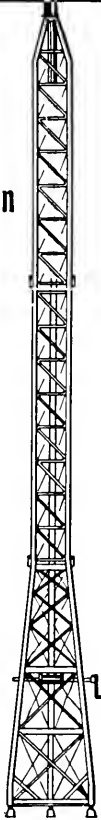
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**NEW HAMPSHIRE** — SCM, Harold J. Preble, W1HS — SEC: BXU, RMs: CRW and COC. PAM: CDX. ARR and DYE both made BPL Two in one month is unusual for New Hampshire. Those interested in a New Hampshire section 'phone net, contact CDX. ZPA is at Air Force Technical School, Biloxi, Miss., for a course in radio and radar. The Port City RC is very busy with plans for a new club house and is planning big things after the September election. JUJ is doing an FB job handling WANE certificates. 2BBR and PRL spent vacations in Portsmouth. The Nashua Mike and Key Club is planning the New Hampshire State Convention for October. Among stations operating portable in New Hampshire this summer were 7NVY, at Freedom, and 1AJT, at Littleton. WUU is very active on 'phone and is regular TCPN net control. It's good to hear JNC back on the air while recuperating from a recent operation. CCE operated part of July in Rhode Island and ZIZ was active in Connecticut. 2JOA needs Hillsboro for WNH on c.w. ARR is a freshman at U.N.H. this fall. Welcome to Novices ETJ, EVG, EVY, FBH, FCU, FDC, FGX, FIH, FJY, FKZ, FZA, FZS, GDO, GDI, and GNW. Traffic: (July) W1ARR 637, DYE 147, ZIW 90, CRW 64, QGU 35, GMH 28, COC 26, CCE 15, IP 14, CDX 8, WBM 8. (June) W1QGU 22.

**VERMONT** — SCM, Robert L. Scott, W1RNA — Nets: VTPN meets on 3860 kc. at 0930 Sun. only. GMN on 3860 kc. at 1200-1300 Mon. through Sat.; VTN on 3520 kc. Mon., Wed., and Fri. at 1900. OAK advises the following were issued net certificates for VTN: IT, BNV, VZE, DAQ, BJP, ZNM, MKM, JLZ, FPS, CBW, TAN, TXY, VTP, QJQ, ELJ, and TAG. VZE reports working W3VZE/M. I have two or three recommendations for ORS but because of their membership lapse in ARRL I am unable to issue the certificates. It is suggested that any of the gang who have any question as to their status in the League check up on the matter. If a member of your family is a ham, they may have membership for \$1.00 — just one copy of QST to the QTH, though. Traffic: W1OAK 104, CMY 101, UEQ 47, RNA 38, KJG 20, BJP 17, IT 5, UGW 2.

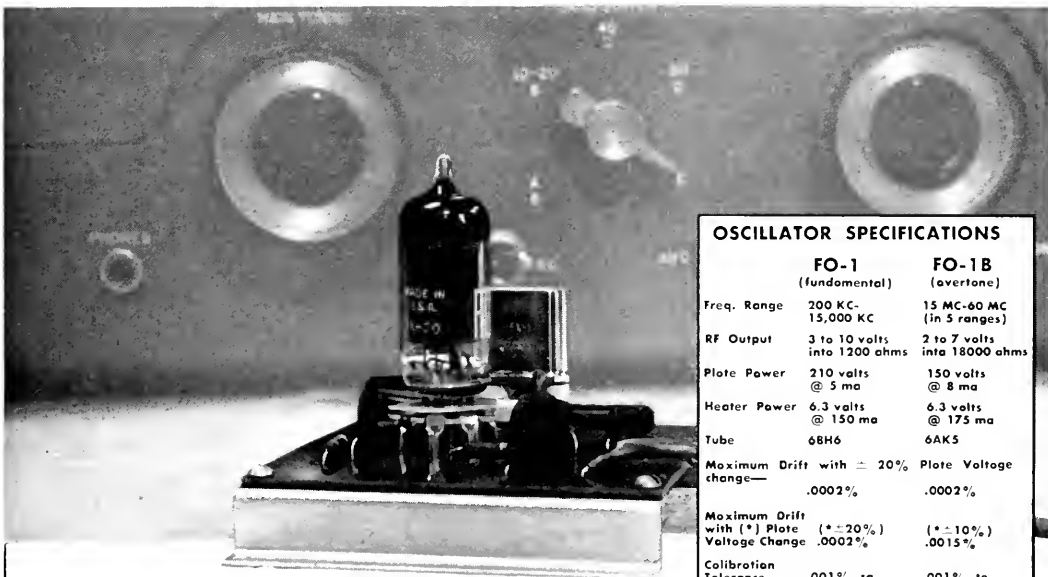
#### NORTHWESTERN DIVISION

**ALASKA** — SCM, Dave A. Fulton, K1ZAGU — The 1955 All-Alaska Ham Convention was a great success. The Hamfest was sponsored by the Anchorage Amateur Radio Club and was held in Anchorage this year. There were 120 licensed hams registered and 119 attended the banquet. AOT and ANG shared honors for the best mobiles. BJW won the hidden transmitter hunt, BK the ragchewers contest, and CC walked away with the c.w. honors (35 w.p.m. with a stick). The highlight of the affair was a visit by Northwestern Division Director E. Rex Roberts, W7CPY. Rex visited Fairbanks before attending the hamfest in Anchorage and stopped at Juneau on his way back home. This is the first time that an ARRL official has ever visited the territory and we certainly hope it won't be the last. If Rex enjoyed it here half as much as we enjoyed having him, we know it will not be the last time for him.

**IDAHO** — SCM, Alan K. Ross, W7IWU — Smelterville: WHZ is applying for OPS appointment. Bonners Ferry: KNTZGE is applying for AREC membership. His rig is a Viking Adventurer and an S-53A receiver. Gifford: VWS worked Maine for his 45th state. He also is after the WAVE award (worked all VE), and has a permanent pen and radio pal in KCNE. Lewiston: A new ham in town is ZYZ. OWA has a new all-band 150-watt rig, but is working on a new p.p. final using 4-125As. Rupert: CAF operated portable from Washington, D. C., in June. We are sorry to hear of the passing of IEX, formerly of Rupert. Idaho Falls: a nice letter was received from VK2TN, who is visiting and enjoying W-Land. BAR and others have been entertaining him. Preston: A very nice letter arrived from RKI who reports he is experimenting with transistors and building a monitor receiver for 3935 kc. A new Novice in town is WN7AOR. Meridian: MKS represented your SCM at Big Springs. Sorry I couldn't make it in person. Traffic: W7OWA 26, WHZ 11.

**MONTANA** — SCM, Leslie E. Crouter, W7CT — Capt. Albert White, ZKV, of the Great Falls Army Air Force Base, felt that their I.f. communications channels could be jammed but that they could get a fix to a particular location. ZKV thought that amateur radio (mobile with loop antennas) in those localities when alerted and with arrangements with the local sheriff could track down and make an arrest of the jamming station. The Great Falls Emergency Corps responded, as reported by net control and EC DSS. TLA, mobile, assisted by TSG, was the hidden transmitter, with 19 hams and 17 stations taking part, of which 9 were mobile doing the hunting. All used loop antennas to look for the hidden rig on 3910 kc., with GFT the only one using an FS meter. GFT found the station in about ten minutes. Capt. White wants something like this in all of four or five of these northern states but wanted it tried out to gain experience to help in organizing. The Old Faithful Radio Club operated under the club call, ZOD, at the Park/County Fair. YPN has been in the hospital and is now taking it easy. VGY is finishing a new 150-watt rig, LPL spent his vacation in Yellowstone Park. On July 3rd TPE, Wolf Point; OYP, Wolf Point; TNJ, Glasgow; and SEW, Malta, set up com-

(Continued on page 100)



## OSCILLATOR SPECIFICATIONS

	FO-1 (fundamental)	FO-1B (overtone)
Freq. Range	200 KC. 15,000 KC	15 MC-60 MC (in 5 ranges)
RF Output	3 to 10 volts into 1200 ohms	2 to 7 volts into 18000 ohms
Plate Power	210 volts @ 5 ma	150 volts @ 8 ma
Heater Power	6.3 volts @ 150 ma	6.3 volts @ 175 ma
Tube	6BH6	6AK5
Maximum Drift with $\pm 20\%$ change—	.0002%	.0002%
Maximum Drift with (+) Plate Voltage Change	( $\pm 20\%$ ) .0002%	( $\pm 10\%$ ) .0015%
Calibration Tolerance	.001% to .01% depending on FX-1 crystal used	.001% to .01%
Size	4"x4"x3" overall	4"x4"x3" overall
Mounting	4 holes (with brackets provided)	

## PRINTED CIRCUIT OSCILLATORS

for Generating Spot Frequencies with **GUARANTEED**  
Tolerance from 200 KC to 60MC

Since the operating tolerance of a crystal is greatly affected by the associated operating circuit, the use of the FO-1 Oscillator in conjunction with the FX-1 Crystal will guarantee close tolerance operation. Tolerances as close as .001 percent can be obtained.

### FO-1 for Fundamental Operation 200 KC to 15,000 KC

FO-1—Oscillator Kit (less tube and crystal) .....\$3.95

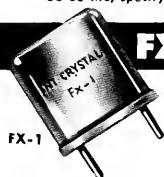
FO-1A—Oscillator, factory wired & tested with tube (less crystal) ...\$6.95

### FO-1B for Overtone Operation 15 MC to 60 MC

FO-1B—Oscillator Kit (less tube and crystal).....\$3.95\*

FO-1BA—Oscillator, factory wired & tested with tube (less crystal) \$6.95\*

\*Includes coil in one of five ranges: 15-20 MC, 20-30 MC, 30-40 MC, 40-50 MC, or 50-60 MC, specify when ordering. Extra coils 35c each.



## FX-1 CRYSTAL Companion to the FO-1 Series Oscillator

The FX-1 Crystal is designed for use only with the FO-1 Oscillator. For tolerances of .01% and .005% any FX-1 Crystal can be used with any FO-1 Oscillator.

For tolerances closer than .005% the Oscillator and Crystal must be purchased together. The Oscillator is factory wired, and the crystal custom calibrated for the specific oscillator.

For crystal prices consult table below:

TOLERANCE	200-499 KC	500-999 KC	1000-1499 KC	1500-1999 KC	2000-9999 KC	10,000-15,000 KC	15 MC-29.9 MC	30 MC-60MC
.01%	\$ 8.75	\$12.50	\$ 5.25	\$ 3.75	\$ 2.50	\$ 3.25	\$ 3.00	\$ 4.00
.005%	\$12.50	\$15.00	\$ 6.00	\$ 4.50	\$ 3.00	\$ 4.00	\$ 5.00	\$ 6.50
(.0025% and .001% tolerances are available only by purchasing the FO-1 Oscillator and Crystal together)								
.0025%	\$17.50*	\$17.50*	\$ 6.75*	\$ 5.25*	\$ 3.75*	\$ 4.75*	\$ 6.50*	\$ 8.50*
.001%	\$25.00*	\$25.00*	\$ 8.00*	\$ 6.50*	\$ 5.00*	\$ 6.00*	\$10.00*	\$15.00*
*Prices are for crystal only. To insure tolerances closer than .005% crystal must be purchased with oscillator factory wired and tested. For total price add \$6.95 to price of crystal desired.								

HOW TO ORDER: In order to give the fastest possible service, crystals and oscillators are sold direct. Where cash accompanies the order, International will prepay the postage; otherwise, shipment will be made C. O. D.

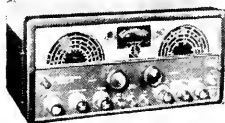
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munications for the mile-and-a-quarter boat race qualification runs at Nelson Lake near Malta. This was a practice run for the Northwest Regional Championship Races to be held at Nelson Lake this fall. Traffic: (June) W7EWR 1.

**OREGON**—SCM, Edward F. Conyngham, W7ESJ—SEC: WAT. New appointments: PRA as RM, QKU as PAM. VBF and WAT are working nights and school days. KAB has been assigned to the swing shift. ZFD has left for Formosa. BLN has taken over as net manager of the Oregon Emergency Net. APF finds things looking up with a new final and no TVI. THX is running 2-meter cheeks from Astoria to Portland. The Salem Radio Club sponsored an OEN picnic July 10th. OEV is rushing construction of mobile equipment before vacation. A new YL Club is being formed in Portland with RVM, pres.; QKU, treas.; WN7ZIN, secy. Other members are REU, SPC, TVU, WFO, ZKY, and WN7WRA. The Oregon State Net reported 19 members, with 123 check-ins in 18 sessions, the highest being 11 in one evening. The Net now connects with RN7, WSN, OEN, and CTN. The Southwestern Oregon Radio Club held a picnic on July 24th with ERC, EUG, BLN, APF, PHG, QYS, VPF, UIH, SPB, AWT, OKM, TLQ, SCY, and UMZ attending. OKM rescued a Canadian car from going over a cliff on Seven Devils Road July 31st. VBF assisted in getting a tow car. We regret to have to report the passing of IEY to Silent Keys. QWZ, QEI, and FPD have taken NCS duty on several MARS nets. SEZ, BDU, and LI are organizing a 2-meter MARS net. WAA reported from Idaho while on vacation. AJN is off for an overhaul and modernization. Traffic: (July) W7APF 332, QKU 92, BLN 50, BVH 41, LT 26, THX 25, PRA 23, UJL 22, TIR 12, ESJ 8, NFZ 6, VDG 5, VJT 1. (June) W7ZFD 224, TIR 19, BDU 2.

**WASHINGTON**—SCM, Victor S. Gish, W7FIX—Nets: WSN, 3575 kc., 1900 PST Mon. through Fri.; WARTS, 3970 kc., 1800 PST Mon. through Sat. AWG joined Silent Keys Aug. 5th. Ten EC reports were listed on the SEC report received from RCM. JHX reports tests on horizontal vs vertical polarization on 2 meters. July brought the SCM a visit from 6GGC, San Francisco SCM, his XYL, and YL. It was very nice to meet Wally, Rose, and Rae. JPH now is mobile /Ø in Minneapolis. PGY reports bad conditions and a scarcity of traffic. VAZ ditto. VE7ASR (mgr. of RN7) was a visitor on Aug. 6th. UIN reports SVMI, of Colville, did a swell job as NCS helping out in the search for lost aircraft on July 30th and 31st. APS vacationed in VE7-Land. UYL reports the new QTH is noise-free. FZB vacationed to Yellowstone in August. LVB spent his vacation fishing. UQY is on all bands with 600 watts. AVM makes a negative report—no traffic, no 2-meter work. CWN had fun in the recent CD QSO Party. BMK has the mobile reinstalled and working. IOH completed the Chamberlain all-band transmitter and then sold his QTH before he had a chance to test it. The old QTH was sold to VLY, who had his rig on the air the first day. UQY reports 5LGG now is A7AIR in Spokane. CBE is on with a transmitter built by KZP. FIX is on again with an ART-13 unmodified except for power supply. The State Department of Civil Defense is trying to sign up all net members in the State to insure immediate operation in case of emergency. A good old-fashioned traffic slump this summer reminds us of pre-KA days. OE is building a new Heathkit AR-2. CCL activity is 100 per cent TCC. LWB's s.s.b. rig voice-controlled threw your SCM on his first try at it. It's time to get ready for the traffic season coming up. Traffic: (July) W7BA 954, PGY 839, VAZ 308, CCL 234, OE 87, UIN 49, APS 27, AIB 22, RXH 22, UYL 20, RCM 16, USO 16, EHH 11, FZB 10, PQT 10, WQD 5, HDT 4, LVB 4, UZB 4. (June) W7TIQ 14, EYF 7.

### PACIFIC DIVISION

**HAWAII**—SCM, Samuel H. Lewbel, KH6AED—The convention in Hilo was the biggest and best yet. For those who missed it, EM extended the invitation from the Maui Amateur Radio Club to all hams to attend the Territorial Ham Convention next year on their island. The Honolulu Amateur Mobile Club has started a drive for 100 per cent ARRL membership as well as 100 per cent AREC. The mobile gang is moving down to 10 meters for RACES frequencies, the first real activity on that band for a year or two. The v.h.f. gang is busy building antennas and still looking for that first Hawaii-Oahu 2-meter contact. WITU/KH6, now at KH6AJF, passed his Extra Class exam. Traffic: (July) KH6AJF 2207, QU 284. (June) KH6AJF 2459, QU 78.

**NEVADA**—SCM, Ray T. Warner, W7JU—SEC: WYQ, ECs: PEW, PRM, TVF, TJY, and ZT. OPSs: JUO and UPS. ORSs: MVP, PEW, and VIU. OBS: BVZ. Nevada State frequencies: Phone 3880 and 7268 kc.; c.w. 3660 and 7110 kc. TVF, of Las Vegas, who has been plunging away on Nevada QSOs, now has over 100 QSLs acknowledging same. The following recently received their "Worked 25 Nevada" certificates: 6PCA, 6SHY, VYC, and YAI. The Southern Nevada Amateur Radio Club now meets in the Victory Village Auditorium the 2nd and 4th Fri. of each month. TVF qualified for his 25-w.p.m. Code Proficiency certificate. OLF, of Elko, is active with a new

(Continued on page 102)

*"Worked 87 foreign countries, all continents and 30 zones" with a Gotham Antenna and 35 watts.*

## READ THIS AMAZING LETTER: How an inexpensive **FULL SIZE** Gotham Rotary Beam made it possible to "work the world!"

Gotham Hobby Corp.  
107 East 126th St.  
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Gentlemen:

Florida, 1955

I'd like to express my enthusiasm and satisfaction regarding your 20-meter rotary beam antenna. I purchased one of your standard two-element units in February of this year. Prior to this time I had been using a collinear array about one wavelength above ground. The transmitter feeding this antenna had a power output of about 35 watts, and results were quite discouraging.

When my Gotham arrived, it was easily assembled in a couple hours. The same transmitter was used to excite the Gotham antenna, using the same power as before. Results have been quite gratifying, and it is interesting to note that in the three months since using the Gotham antenna, I have worked 87 foreign countries, all continents, and 30 zones.

I am able to keep schedule with amateur radio —\* in the Cape Verde I-lands every week. *It was impossible to even hear this station before using the Gotham beam.*

Extremely high winds are prevalent in this part of Florida. The Gotham beam has withstood blows in excess of 50 miles an hour without failure.

The elements bend almost double in these high winds, but readily return to their original configuration when the wind abates. I feel that this is an extremely important feature of the Gotham antenna.

I have enthusiastically recommended Gotham to all the hams who ask what type I am using (and most of them do, when I tell them the amount of power I'm using). I wish you every success with your product, and feel that it is well worth the modest price.

Yours very truly,

(Names and \*call letters upon request.)

### EVERY FULL-SIZE GOTHAM ROTARY BEAM IS ENGINEERED FOR SIMPLICITY, STRENGTH, PERFORMANCE

Your Gotham comes to you completely fabricated, made (except for the polystyrene insulator) entirely of new, rustless, first-quality mill stock aluminum. You'll find no link coupling, no complicated mounts, no tuning stubs. You get good, solid aluminum tubing—and more of it, in both length and thickness (the only true gauge of \$ value)! No flimsy wire, no wood to rot or weather-proof.

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Missouri: Henry Radio, Butler.  
New Hampshire: Evans Radio, Concord.  
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No. Carolina: Allied Electronics, 411 Hillsboro St., Raleigh.  
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N. Dakota: Fargo Radio Service, 515 Third Ave., North, Fargo.  
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Ohio: Selectronic Supplies, Inc., 1320 Madison Ave., Toledo.  
Ohio: Srecco, Inc., 135 E. 2nd St., Dayton.  
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#### 20 METER BEAMS

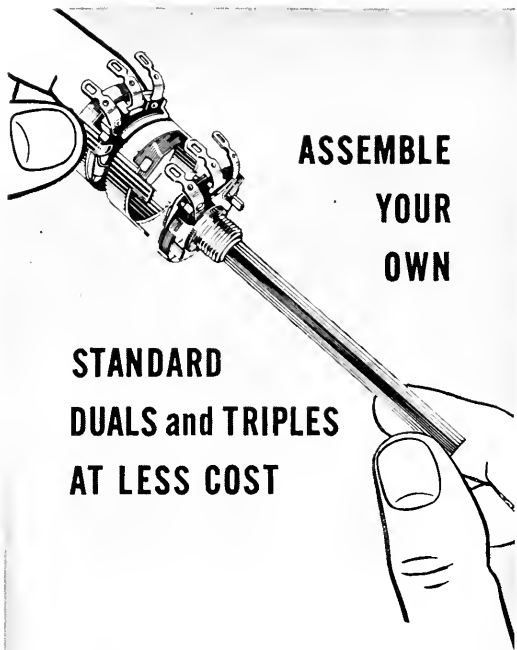
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Viking II. YRY, of Boulder City, is keeping Far East skeds in the wee hours of the A.M. with a Globe Scout. 6PWE, Peanut Whistle Eddie, has returned to Boulder City after an absence of almost 15 years. ZZE is an old-timer who has returned to the flock with a new call in Henderson. ARA, recently licensed, also is in Henderson. ZZH is the XYL of MBQ/K6BXK.

**SANTA CLARA VALLEY**—SCM, R. Paul Tibbs, W6WGO—Asst. SCM: Roy E. Pinkham, 6BPT. SEC: NVO. EXX reports that the PAARA did not hold its meeting in July. He keeps his OBS schedule on Mon., Wed., and Fri. at 1945 on 145.8 Mc. K6BBBD worked in the July CD Contest. Dick is installing mobile in the "new 47 Mercury." WLI reports a lack of 'phone stations in the CD Contest on that week end, both on 40 and 20 meters. AIT still is working traffic in NCN and RN6. ZRJ ordered a Heath VFO. FON still is active on the MTN 'Phone Net, acting at times as eastern traffic outlet. K6GID, mgr. of NCN, is calling for new members to check into the net from the East Bay, San Francisco, and Santa Clara Valley sections. This net serves as outlet at section level for the NTS. Anyone interested in traffic work can find much pleasure by spending an hour or so most any week night working in this net. HC reports that the higher nets of the NTS are doing quite well this summer in spite of QRN and skip conditions. A nice report was received from CUB with this dope. Dave runs a Viking Ranger working the following DX: SM, OH, OE, FY, G, DL, JA, VK, and more. Power was about fifty watts using a long-wire antenna. He reports CLS is moving back to Hillsborough setting up a KW-1 in the tool shed before starting his house. GCG climbed pine trees to string CLS's sky wire. Traffic: W6ZRJ 215, HC 94, FON 93, K6GID 76, W6AIT 22, BPT 22, CUB 19, K6BBBD 12.

**SAN FRANCISCO**—SCM, Walter A. Buckley, W6GGC—At the July meeting of the San Francisco Radio Club ATO gave a demonstration and exhibit of new commercially-built amateur radio equipment. BIP reported that Field Day was very successful; more than 100 contacts were tallied. With Dad's new call, KN6JUK, the Harlan boys now have a complete "ham family." Sons Harry and John are K6AES and W6OST. W6IKO and club treasurer Harry Witzke had a nice mobile vacation to Idaho. BSO, Father Bose, now is back on mobile operation. K6HYW sports installation on 6-meter mobile. KN6HIW and W6QMO represented the local ladies' club at the ARRL National Convention in Santa Monica. The HAMS (Red Cross group) and the Hi-50 Club say there have been lots of band openings on 6 meters lately. The 29ers invite all amateurs locally who have 10-meter installation in mobile to join them in monthly transmitter hunts. The 29ers held its annual breakfast July 24th at Fosters Restaurant with a good turnout. PKI is operating at Devenshire Uranium Supplies in San Carlos. PCN was hostess for the ladies' club at the July meeting and it served two purposes. The OMs also were invited and all enjoyed a housewarming at PCN's and GCV's new QTH. The Tamalpais Radio Club held its first after-summer session meeting on Sept. 9th. The Humboldt Radio Club had an ARRL membership drive with good results. GDV, YXQZ, K6CNV, W6BBW, K6CXB, KN6KGI, W6JSY, K6DVV, W6BJO, and JUH manned the c.d. headquarters station for the June drill. K6CNV now is a resident of Eureka. Congratulations to BIP, QMO, and GQA in coming in tops for the San Francisco Section in the July CD Party. OPL has a new QTH in Terra Linda. He requested more activity in ham radio for this section so will act as the new Asst. SCM along with Asst. GHI. JWF finished the new 100-watt Heathkit and expects to be on the air soon. CBE has the new pair of 4-125As final finished and working swell. He received MARS appointment and has been keeping daily skeds with mobile PKH on his Eastern trip. SWP, Pat Ryan, has been critically ill and will not be heard on the air for some time. He is in Ward 74-A, Oak Knoll Hospital, Oakland, Calif. His XYL reports that Pat may never be active in radio again. His many friends will be sorry to hear this as Pat was very active on the nets and a faithful worker. WB has accepted the assignment as chairman of the National ARRL Convention which will be held in San Francisco in '56. With Bud as top man the Convention is expected to be a huge success. Your SCM had a wonderful time meeting the boys of the "Grandpappy's Net" at the roundup in July at KUP's QTH in Ruth, Calif., and attended the Humboldt Radio Club meeting in Eureka and then on to the Oregon Emergency Net Picnic at Salem, Ore. A wonderful time was had and I enjoyed meeting 7SY (at the Salem OEN Picnic) and many of the other fellows I had talked to over the air. I also met that swell fellow, 7FLX, who does such a grand job editing the PAN News and enjoyed a steak dinner and dandy pie at K6AKF's and his XYL Madge's QTH. PHT now is busy doing remote-control radio broadcasting. Traffic: (July) W6QMO 93, GGC 32, BIP 8, GQA 5. (June) W6QMO 85, PHT 8, GQA 6.

**SACRAMENTO VALLEY**—SCM, Harold L. Lucero, W6JDN—With the coming of the cooler weather, also the end of most vacations, I believe the Official Appointments should be listed so that all will know who is who in the Sacramento Valley section. SEC: JEQ. Asst. SCMs: ZF, K6BMU, and TMP. ECs: K6AKF, BYS, CFZ, RXN, IVD, FKI, ULC, and KTB. OBSs: SBN, MWR, FNS, ILZ, (Continued on page 104)

*The Original*

# TILT OVER TOWERS

(Patent applied for.)

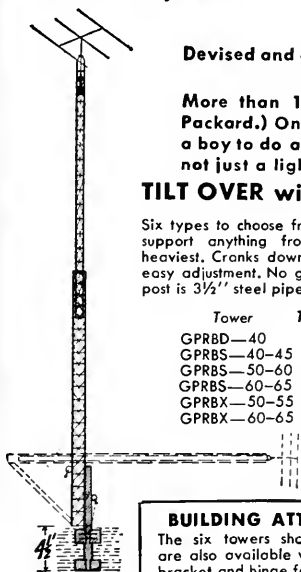
Devised and created by E-Z Way over 5 years ago. Often copied but never equalled.  
**TESTED AND PROVEN**

More than 15,000 satisfied users. "Ask the Ham who owns one." (Courtesy, Packard.) One of the sturdiest and most versatile towers in the industry. Don't send a boy to do a man's job. E-Z Way Towers are designed to support Rotary Beams—not just a lightweight TV antenna. We invite comparison.

## TILT OVER with Ground Post

Six types to choose from—40 to 65 ft. Built to support anything from a Mini-Beam to the heaviest. Cranks down and tilts over for quick, easy adjustment. No guy wires needed. Ground post is 3 1/2" steel pipe or larger.

Tower	Tower Hgt.	Price
GPRBD—40	38 ft.	<b>\$120.00</b>
GPRBS—40—45	38 ft.	<b>\$160.00</b>
GPRBS—50—60	48 ft.	<b>\$210.00</b>
GPRBS—60—65	58 ft.	<b>\$260.00</b>
GPRBX—50—55	48 ft.	<b>\$325.00</b>
GPRBX—60—65	58 ft.	<b>\$385.00</b>



## BUILDING ATTACHED

The six towers shown above are also available with a wall bracket and hinge for the base for attaching tower to the side of a building. Crank up and down.

BARBD—40.....	<b>\$ 95.00</b>
BARBS—40—45.....	<b>\$130.00</b>
BARBS—50—60.....	<b>\$170.00</b>
BARBS—60—65.....	<b>\$210.00</b>
BARBX—50—55.....	<b>\$265.00</b>
BARBX—60—65.....	<b>\$325.00</b>



Provisions to mount rotor inside top of tower. Bearings at A and B relieve all strain from rotor.

## BUILD IT YOURSELF

Go as high as you like with 20 ft. sections. 320 ft.?



### C-10

Width 10"  
Max. Height 120 ft.  
Guy Spacing 27 ft.  
Weight per ft. 4 1/2 lbs.  
Price (approx.) \$2 per ft.



### C-15

Width 14"  
Max. Height 200 ft.  
Guy Spacing 40 ft.  
Weight per ft. 8 lbs.  
Price (approx.) \$3.50 per ft.



### C-25

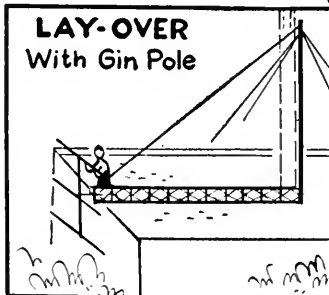
Width 25"  
Max. Height 320 ft.  
Guy Spacing 60 ft.  
Weight per ft. 20 lbs.  
Price (approx.) \$9 per ft.

Used extensively for VHF and UHF communication antennas. Two other sizes available. When maximum height and guy spacing are not exceeded, these towers will withstand a 60 lb. wind load.

Three types to choose from—40 to 60 ft. Ideal one-man installation for flat roofs or porches. Cranks up and down and lays over for easy antenna adjustment. No guy wires needed. Tower is locked in a V-bracket at top of gin pole.

GINRBD—40	<b>\$125.00</b>
GINRBS—40—45	<b>\$165.00</b>
GINRBS—50—60	<b>\$215.00</b>

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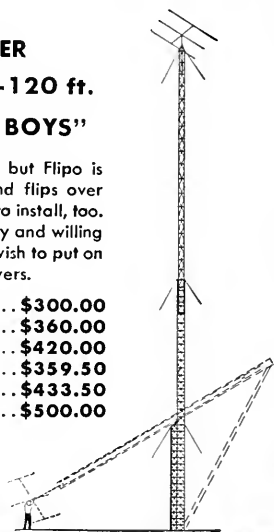
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80-100-120 ft.

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FORBX—100.....	<b>\$433.50</b>
FORBX—120.....	<b>\$500.00</b>



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**Model 587**

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no insertion loss  
no controls  
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RESPONSE		
Down	Low CPS	High CPS
3db	at 415	to 3100
20db	at 187	to 6700

- Effectively limits audio range to keep your signal confined to the proper channel.
- Better side band suppression on SSB.
- On SSB phasing transmitters, it enables the use of smaller capacitors in the power supply.
- Only 4" long x 1 1/4" diameter.
- No wiring. Fitted with mike connectors and 5 1/2" cable.
- Reduces acoustic feedback in PA systems.

See page 64 - July '55 QST



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of your present receiver:

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Provides either a sharp peaked IF curve or deep rejection notch. Easily attached. For 455 kc. IF.

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Also available for 915, 500 and 262 kc. IF.

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and K6AKE, OPSs: MWR and FNS. ORSs: CMA (who is now our RM), FYK, K6GL, ASX, W6SYY, and KTB. PAM: TYC. OESs: W6LSB and QAC. OOs: K6ER, W6ILZ, FNS, FYK, BIL, KTB, and K6EHT. The recent boat race from Stockton to Redding, Calif., was well supported using mobile and fixed equipments . . . notes sent QST. Hats off to all who participated and did a grand job. The Feather River Amateur Radio Club is now 100 per cent ARRL; also the Tehama County Amateur Radio Club boasts the same. This is wonderful and it looks like our section is growing. K6ER is back from a fine vacation. TYC is going to resign as PAM because of his work. Sorry to hear this, Jack, but thanks for your hard work and we will see you on from time to time. JRY is attending PT&T Radio School. IMH moved to Berkley, K6BCW is now ruled by his XYL. Congratulations. QJD has a new mobile. HNL has a new sky wire. JDN was made Alt. NCS on MARS. I would like to have all clubs send me news of their activities so that I can be more fair in the reporting each month. Thanks, fellows. CU next month with more news. Traffic: W6CMA 114.

**SAN JOAQUIN VALLEY** — SCM, Ralph Saroyan, W6JPU — PSQ has a 10-A. KN6LLF has an RME-45 and is on 80-meter c.w. K6GBS is with Western Electric as a field engineer. QOS has a new harmonic, a girl. Congrats! LOS is heard on 75-meter s.s.b. NAS and NCG are on 2 meters with model 26 teletypes. JXY is sporting a 20-meter beam. UJU is rebuilding his SX-88. OWL is on 20 meters with a new beam. K6GTI is building a ham shack with house attached. PPO has a new Phasemaster and likes it. K6CBQ is on mobile with Carter modulator. The Fresno Radio Club gang did a bang up job on the Cerebral Palsy Telethon. The Club received a trophy "for magnificent help on 'celebrity parade' united Cerebral Palsy." JUK has an FB patio at the new home. SNF is heard on 75 meters with a wicked signal. NBP is with Uncle Sam in the Air Force. K6BGK has a loop for 75-meter hunts. ONK is chief in charge of 2-meter repeater for the Fresno Area and reports very good progress. TTX won a \$800 scholarship. PIQ is now in Alabama. KN6MQV is a new ham in Rosamond. K6GMQ now is Technician Class in Mojave. How about a report from down south and from up north, fellows? We received only one report this month. Traffic: W6TTX 496.

## ROANOKE DIVISION

**NORTH CAROLINA** — SCM, Charles H. Brydges, W4WXX — SEC: ZG, RM; VHH, PAM; ONM. Congrats to LEV on making BPL in June. VFK received his Globe King and is burning up 75 meters. GNF, the Greensboro Club, is looking at new club locations. NIHW, in Greensboro, has been busy with the RACES program. TAJ has worked over 100 European stations. KN4DXI is a new Novice in Greensboro. CVX received cards for WAC and is busy on 75 meters with the teen-age net and on 20 meters with DX. The Confederate Teen-age Net has over 30 members and covers six states. You older fellows are invited to call in anytime. BUA and CZR had a good time operating CZR/4 at Cherry Grove Beach. Nearly 200 attended the Charlotte Swap-Fest held in the Army Reserve Training Center. Welcoming speeches were presented by the Army, the SEC, and the SCM. GHS is busy working on YLCC. Since most of us are emergency-minded and engaged in emergency planning, publicity is one of our most important problems. If you will give the city editor of your local paper the basic material on club activities and the like he will be more than glad to put the information in the paper, and this will go a long way in getting the public to know you and your purposes much better. The Winston-Salem gang still meets on 3805 kc. every Sat. If any of you are in the Winston Area, don't fail to call in on 3805 kc. If you want call letter plates for your car send your application with a money order for one dollar to the Motor Vehicles Division, State Capitol, Raleigh, N. C., by Nov. 1st. Please include your name, address, and call on the return address portion of the envelope. ZQB is now high power mobile using an ART-13. MDA is on 2 meters. KN4ADT is really working the DX on 15 meters. EOU has a new Viking II. K4EAR is ex-5ETV from New Orleans. EJP has a new 150-ft. long wire and is working 'phone and c.w. on all bands. WN4HPJ is back in Blowing Rock and working on exams. BUW is trying to get a BC-454 installed in the car. ZH is on 40-meter 'phone with a new 40-meter beam. NIHW has a new 200-watt 2-meter rig with 24Gs in the final. Traffic: (July) W4RRH 50, GHS 30, BUA 14, CVX 12, AGI 8, ACY 6, GJD 4, EJP 2. (June) W4LEV 794, BUW 20.

**SOUTH CAROLINA** — SCM, T. Hunter Wood, W4ANK — ZIZ reports that much of his traffic is relayed by MARS. IMG reports that the Columbia paper carried a new story about ham radio in which was featured HDR, who has earned and has received the BPL medallion for handling enough traffic to make BPL three times. The following are members of the South Carolina MARS C.W. Net: ANK, ET, FFH, DYP, IMG, PLX, YOII, LSD, AWY, CHD, WSA, and UOQ. Many South Carolina hams attended the Augusta-Camp Gordon Hamfest on July 23rd. It was necessary to prepare this report early this month, therefore few activity reports were received in time.

(Continued on page 106)

# 2 DX Bands!

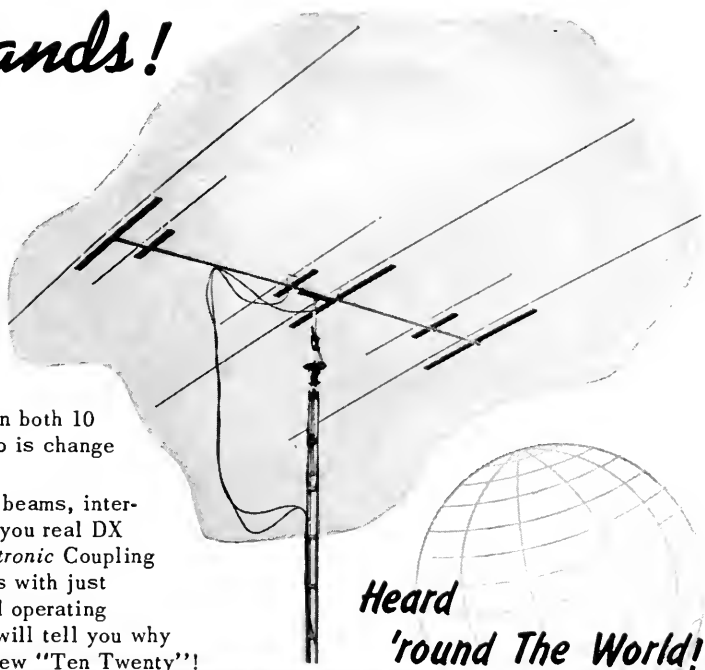
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#### SPECIFICATIONS and DATA — Model VPA-1020

Forward Gain (over full size dipole): 7.5db.

Front-to-Back Ratio: 28db.

S W R: 1.5/1, or better, at resonant frequencies.

(Performance data essentially the same for both ten and twenty meter operation.)

Elements: 61ST6 Tubular Aluminum. Maximum length, 22½'.

Boom: 1½" OD 61ST6 Aluminum. 12' long.

Wind Surface Area: 11.4 sq. ft.

Wind Load: 228 lbs.

Weight (Assembled): 57 lbs.

Tuning: FACTORY PRETUNED to three resonant frequencies in each band. Drilled and color coded element sections.

Model VPA-1020, complete with "V-P" Coils, Auto-Electronic Coupling Yoke, all necessary hardware and full instructions. Less mast, rotor and coax line.

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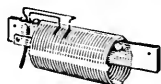
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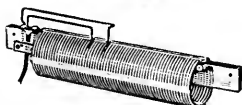
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40 Meter Coil  
Net Price \$7.95



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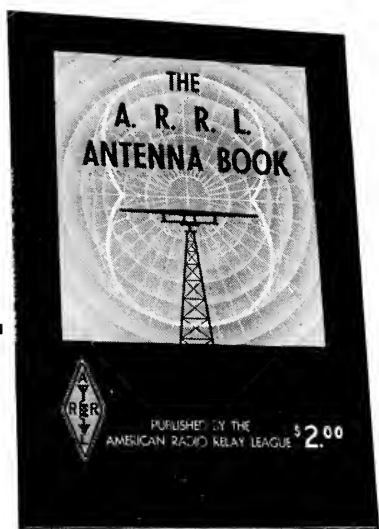
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WEST HARTFORD 7 CONNECTICUT

Late reports will be included next month. Traffic: W4FFH 99, ZIZ 97, ANK 5.

**VIRGINIA** — SCM, John Carl Morgan, W4KX — This report was written in August when usually there is little to tell about because of summer doldrums. But in spite of very persistent QRN, record high temperatures, etc., the nets have been perking nicely and there has been lots of other activity. VFN and VN members cooperated in the AREC "Hurricane Drill," which is designed to prevent the haphazard operation which obtained last year. Following the drill, the Tidewater Mobile Club had an FB picnic. VFN also furnished communications for the Old Dominion Motorcycle Road Run. The Rappahannock Club furnished communications for the Fredericksburg Soap Box Derby. The Shenandoah Valley Club played host to some 180 hams and families at the 4th Annual Dickey Ridge "Fest." BLR reports on a fine YLRL picnic on Skyline Drive. TFZ says ODN has added a Saturday session, and YKB reports formation of the new Late Evening Net on 3820 kc. K4ASU earned a BPL medallion by the "originations" route, and has issued the first edition of the VN Directory. NQV is off to England and Cambridge on a National Science Foundation Fellowship. There are new harmonics at TVO/SIE and also at OWV, who reports the first words were "CQ" off frequency but 5 by 9. IA and TFX are ensconced in the new QTH at Warrenton, and KFC is trying to improve his notoriously puny signal by moving to a 20-acre antenna farm at Clifton, Va. YE, YZC, and KN4CAX also are about to break in a new wigwam in Fairfax County. 3WDP and K2KNN are taking turns chasing traffic and DX from K4MC. KX is off the air rebuilding. Dampness in the basement blew the final, so we have a new dehumidifier. LW now is in the new QTH with a Lyseo 600 rig and linear final. EBH now is trying a new 37V all-band vertical, and first reports were very FB. RTV is trying to outdo HQN with a "plumber's nightmare" mobile antenna. Traffic: W4PFC 685, K4ASU 266, W4CGE 232, K4MC 108, W4BLR 37, YKB 37, YZC 26, WBC 14, KN4CNP 8, W4APM 4, OWV 3, KFC 2, IA 1.

**WEST VIRGINIA** — SCM, Albert H. Hix, W8PQQ — SEC: GEP. PAM: GCZ. RMs: GBF, DFC, HZA, and JWX. It is with sorrow that I announce the passing away of Ed Lockhart, sr., NAM. New Novices in Princeton are CXV, BFG, BIK, ADG, AGK, and DSK. Recent Novices in the St. Albans-Nitro-Dunbar Area are UQP, TVK, VBD, ADD, TVO, BOZ, and CUK. I would greatly appreciate receiving more activities information. For those who desire reporting forms, please request same by dropping me a post card. The Princeton Club has resumed regular meetings on the 1st Fri. of each month at 8:00 P.M. at the City Hall. LSG has a new B&W 5100. NLT has a new 20-meter beam operating. The W. Va. C.W. Net maintained excellent activity participation during summer months. CLX has an s.s.b. rig now. Traffic: (July) W8KXD 89, HZA 40, JWX 35, NYH 21, PZT 12, BWK 9. (June) W8JWX 31, BWK 22, NYH 9.

## ROCKY MOUNTAIN DIVISION

**COLORADO** — Acting SCM, Carl L. Smith, W0BWJ — The value of AREC preparedness and training was emphasized to Colorado during the flood of last May. Special thanks are due NVU and his wife for going on emergency stand-by before the disaster struck, and for operation during the entire period. Mac, Milt, and Dave of K0WBB were at the scene with emergency equipment. Excellent work was done by KQD, SUP, IUF, ICR, PGN, OIQ, WIR, and K0ANZ in handling traffic coming out of the area. Congratulations to all for a job well done. The Sky High Radio Club held a picnic at Monte Vista and all attending had a fine time. MYX had BDR and his wife, from Iowa, as guests. A picnic was enjoyed by the families of KQD, BDR, and MYX with traffic the subject of a big ragchew. LZY is on 7094 kc. at noon on Tue., Wed., and Fri. with the latest Official Bulletins. SGG has 15 watts 'phone and c.w. on 6 meters; he and SWS are hoping to get some activity going. Anyone interested? CSSN (slow-speed net) meets Mon., Wed., and Fri. at 1715 MST, resuming operations on 3570 kc. Oct. 3rd. Former members and newcomers invited. In the meantime, all c.w. operators are urged to check in to the High Noon Net — there's plenty of activity for you. During July the High Noon Net handled 191 messages in 19 sessions. Late BPL credits: K0WBB March, April, and May; KQD April; TVI April, ANZ April; NVU May, and LO/0 May. Amateurs in Colorado, New Mexico, Wyoming, and western portions of Kansas, Nebraska, and South Dakota are invited to take part in a QSL card contest being held until Nov. 30th. Full details are available from Rapsco, 1237 16th Street, Denver. Traffic: (July) K0WBB 639, W0KQD 414, IUF 52, OGO 29, BWJ 21, HOP 17, NVU 16, UNAL 14, YMP 14, PGN 12, SWK 12, W5WDK/0 11, W0AGU 9, SKK 9, NWJ 7, YNC 6. (May) K0WBB 997, W0LO/0 302, NVU 194. (Apr.) W0KQD 765, K0WBB 728, ANZ 712, W0TVI 240. (Mar.) K0WBB 695.

**UTAH** — SCM, Floyd L. Hinchaw, W7UTM — Vacation time still is with us, judging by the lack of activity this

(Continued on page 108)

# Quality, Style and Beauty



**TE GPR 90**

## THE *ALL NEW* COMMUNICATIONS RECEIVER

- FEATURING:**
- Six bands covering .54 to 31 Mc.—AM, CW, MCW, and FS with appropriate FS converter.
  - Accurately calibrated main tuning dial plus auxiliary dial with full Electrical bandspread.
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- Specially designed Audio Selectivity control with variable bandwidth.
- Diversity operation is available with the GPR-D. Provisions for external control for HFO, BFO, IFO.
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- Cabinet or rack mounting . . . 52 lbs. . . 20" w. x 10" h. x 15" d. (Cabinet.)

### Tube complement:

- 6AB4 Grounded grid input RF amp.
- 6CB6 2nd RF
- 6AU6 1st converter
- 6AG5 Oscillator
- 6BE6 2nd Converter and Oscil.
- 6BA6 IF Buffer Amp.

- 3-6BA6 IF Amplifiers
- 6AL5 Det./Noise Itr.
- 6AG5 BFO
- 12AX7 Avc and Audio Amp.
- 6V6 Output
- OA2 Regulator
- 5U4G Rectifier

Bulletin 179B for complete details.

Complete receiver—Amateur Net **\$395<sup>00</sup>**  
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The Millen 90672 Antenna Bridge is an accurate and sensitive bridge for measuring impedances in the range of 5 to 500 ohms at radio frequencies up to 200 mc. It is entirely different in basic design from previous devices offered for this type service inasmuch as it employs no variable resistors of any sort. The variable element is an especially designed differential variable capacitor capable of high accuracy and permanency of calibration over a wide range of frequencies. A grid dip meter such as the Millen 90651 may be used as the source of RF signal. The bridge may be used to measure antenna radiation resistance, antenna resonance, transmission line impedance, standing wave ratio, receiver input impedance and many other radio frequency impedances. By means of the antenna bridge, an antenna matching unit may be adjusted so as to provide the minimum standing wave ratio on the radiation system at all frequencies.

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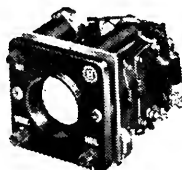
300 mc plus an arbitrary scale for use with the 4 additional inductors available to extend the range to 220 kc. . . . . **\$61.50**

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month. Even 2 meters seems deserted when compared with the winter months. SAZ has his receiving gear for 2 meters complete and will have his transmitter by fall. STC is busy servicing commercial communications equipment, and is heard only occasionally mobile in the southern part of the State. LQP has a new Buick and now must change to 12-volt gear. MWR has a good signal on 75 meters again, after having had a siege of transmitter trouble with his big rig. LQE is faithfully NCSing the Utah MARS weekly drills; but thunderstorm QRN has given him plenty of trouble.

**WYOMING**—SCM, Wallace J. Ritter, W7PKX—The Annual Wyoming Hamfest was a big success with a record attendance from six states. The Casper Club will sponsor the 1956 Hamfest. HDS is going strong on the Wyoming Weather Net at 0700 MST on 3925 kc. getting much-needed information for the U. S. Weather Bureau. NII is checking in regularly with Jackson weather. Welcome ZUC, at Encampment, to the Wyoming nets and 75 meters. ACG has been appointed as SEC. All ECs, please cooperate. TZK and PAV reported a plane crash, fatal to two, at Alva, Wyo., via amateur radio to CAA. The Cheyenne Club held a picnic. PKX received a Public Service Award for assistance in the Belt Creek, Mont., Flood. JFN is moving all over Wyoming getting 59 reports with a fishpole antenna. AXG and NII attended the Big Springs Annual Hamfest. ØBDR, the SCM of Iowa, walked away with the c.w. speed prize at the Wyoming Hamfest. NVI is handling the Pony Express Net on Sun. mornings in fine shape while the regular NCS takes a rest. NVI was heard to break the WX Net one morning and frantically inquire how to milk a goat. YSF is running higher power and has a much better signal. Your SCM wants more news from local clubs, etc., and is looking for QO applications. Traffic: W7HDS 104, PKX 97, YSF 74, PAV 59, TZK 43, NII 37, MNW 31, AXG 29, AEC 23, NVI 10.

## SOUTHEASTERN DIVISION

**ALABAMA**—SCM, Joe A. Shannon, W4MI—SEC: TKL, PAM; WOG, RM; KIX. Several clubs have announced election of new officers: Montgomery: IWX, pres.; AZX, vice-pres.; K4AJZ, secy.-treas. Huntsville: GEQ, pres.; NKX, vice-pres.; K4BFT, secy.-treas.; HHU, act.; KPD, training. Tuscaloosa: HFK, pres.; KN4DSR, vice-pres.; KN4CFD, secy.-treas. Birmingham: UEI, pres.; HVH, 1st vice-pres.; BMV, 2nd vice-pres.; KNW, secy.-treas.; YEP, rec. secy. USM reports that UJJ is back on the air at Auburn. ZSH has had a bucketful of rig troubles, all of which apparently are all smoothed out now. WOG continues to snatch some good DX on occasions and he, DFE, HKK, and MI are suffering through reinstalling mobile gear in new cars. DTT has joined the mobile ranks while CJA and K4AYR are busy getting Vikings (mobiles) installed. K4AOZ, W4TWK, and HFK are now mobile. DXB says that after all these years he now is VFO and can slide around. HPZ, in Cullman, now is General Class. K4BSV operated portable from NG summer camp at Camp Shelby, Miss., with good results. TXO reports that he gradually is converting the BC-669 to all-band operation. Traffic: (July) W4COU 426, UHA 149, HKK 115, KIX 62, WOG 53, YRO 44, ZSQ 37, DTT 33, DXB 31, EJZ 24, YAI 18, TWK 14, RLG 13, K4BSV 12, TXO 6, USM 6, K4AOZ 4, W4CRY 4, ZSH 4, TKL 2, RTQ 1. (June) W4COU 434, UHA 431, ZRZ 65, WAZ 16, RLG 14, YAI 13, YDU 2. (May) W4YAI 32. (Apr.) W4YAI 61.

**EASTERN FLORIDA**—SCM, Arthur H. Benzee, W4FE—Thanks to everyone who voted in this election. The large number of ballots cast indicates a healthy interest in League affairs. Your responsibility does not stop there; it is only by concerted effort, everyone pulling together, that we can maintain the high rating this section has enjoyed for some time. Get your reports into the mail promptly. If you do not have cards, ask for them. Do not hesitate to call on me for any assistance. I shall be only too glad to help where I can. PJU is touring the West and will return in October. FWZ reports lightning damaged his station and antenna but they now are back in service. Lake County: LARA 1955 officers are SXJ, pres.; FE, vice-pres.; VDY, secy.; YUT, treas.; YAN, act. mgr. The club auxiliary power unit is in operation. K4ABV and W4HZU are now General Class. VDY has a second call at his store, K4ECF. New Novices are KN4s EAD, EMB, and EJW. Another class is under way. 29,560 kc. is monitored daily. Miami: The Florida Hurricane Net began operation July 24th. The net call is HN and the net manager is YJE. The Net meets Sun. at 0700 EST on 3695-kc. c.w. alternate frequency 7125 kc.; also 3975- and 7270-kc. phone. Jacksonville: The YLs and XYLs had a half page in the July 21st issue of *Times-Union* with pictures, courtesy of YNY. The Coastal Emergency Net has been set up covering Key West, Fla., to Norfolk, Va. Net Control is VSX-HHO. The Net will be activated in the event of disaster in that coastal area. DES passed away Aug. 3rd. Traffic: (July) W4PUJ 326, WS 64, IM 47, ZIR 38, FE 28, FJE 26, FWZ 12, FSS 10. (June) W4ZBA 145, FJE 20, EHW 7, AHZ 4.

(Continued on page 110)

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**WESTERN FLORIDA** — SCM, Edward J. Collins, W4MS/RE — SEC: PLE, ECs: MFY and H1Z. K4AKP is proudly exhibiting a BPL medallion. WN4HBK passed his General Class exam. KN4CLJ has a new transmitter. KN4CLK received a direct hit on the rig by lightning. AXP is sporting a new Lancer car. MUX is home again and building a beam. PAA is operating all bands. QK has an FB VFO perking for net work. KN4EEG is the newest ham in Pensy. CRK is heard calling DX. CCY is tuning the beam to the last watt for DX. BGG is doing antenna work. KN4ADY is looking at a new trailer for beam location. GMS has a new beam on 15 meters and is becoming a DX hound. HJA has the finest mobile set-up in the area. EAR has improved the audio 100 per cent. UCY is really enjoying 10 meters now that it opens regularly. PQW is working on the mobile gear. BIJ has a new v.t.v.m. Ex-PN promises to get a new ticket after a 20-year layoff. FHQ spends his operating time on c.w. K4ABI is going West soon. ZFL still is mobile bicycle. KN4AEP is going after General Class. YRF is looking for contacts with his brother in DL-Land. MS is enjoying s.s.b. and is dusting off the 50-Mc. gear. JPD still prefers 40 meters. DDD went up for General Class. YES is giving the DX-100 won at the Pensy Hamfest a workout. How about some reports from the rest of the section?

**GEORGIA** — SCM, George W. Parker, W4NS — SEC: CFJ. PAMs: ACH and LXK. RMs: MTS and OCG. It is with much regret that we accept the resignation of OPE as SEC. Abbott has done an outstanding job in this office, and we are very sorry that his job will make it impossible for him to continue. However, we were fortunate in securing the services of CFJ, of Atlanta, to fill the vacancy. We have every confidence that Bill will carry on with the work Abbott has so well begun. DX-100s are sprouting all over Atlanta. They can be found in the shacks of NS, NQO, FII, SWZ, and TJS. The Atlanta Radio Club's classes, under ZD, MTS, and KOR, graduated a group of Novices last month. Those receiving calls were KN4s DHN, DNI, DNL, DNS, DMX, DMY, DNR, and DOI. FZO is putting up a quad for 20 meters. BWD attended the Pittsburgh Hamfest while on vacation. BYJ, UJM, YWP, and MNJ are back on the air after a siege in the hospital. KN4ANZ has a new Globe Scout. KN4DKM has an AT-1 on 80 meters. LNG still is in the Army and is not too active. IPL has two new 75-foot poles, and is putting up a 10-15 beam. WKP has a new 15-meter beam above his 10-20 array. A new club is being formed in North Georgia. If you live in the vicinity of Rossville, contact BGB. FZO has an 813 rig on 80 and 40 meters. With the return of cooler weather your SCM hopes you will include a little more news with your reports. Traffic: W4OCG 234, PIM 183, HYV 44, NS 36, HYW 28, ZD 20, MTS 18, FZO 12, BWD 4, BYJ 4, BXV 2.

**WEST INDIES** — SCM, William Werner, KP4DJ — SEC: JM. JM, our new SEC, requests cooperation in making a bigger and better AREC organization. The first hurricane alert of the season found the Net ready with one station in each town with an available source of emergency power. WT acted as NCS of the 3925-kc. Net several times in the past month. ZC moved to Caguas. W4HZ, operating /KP4 while awaiting a new call, uses 32V-1 and SX-28. PW is on active duty with the National Guard. CG, DO, DV, JZ, and ZC were heard operating mobile. ACZ received his license July 20th and is on s.s.b. Please note the s.s.b. frequency for KP4 is 3850 kc. W2NIJ is the outlet for KP4 traffic on 14,280 kc. FI has completed his kw. transmitter and a three-element 20-meter beam. PZ built a two-element 20-meter beam. KP4ID/KP4, at the c.d. office in Rio Piedras, boasts a new Onan emergency power plant because of the efforts of MP. Police headquarters at Arecibo, Aguadilla, Mayaguez, Ponce, Guayama, and Ilumacao have made their 5-kw. emergency power plants available to amateurs. The power company at Mayaguez offered 11G the use of its 3-kw. emergency power plant. The Antilles Net on 3815 kc., KP4YX NCS, was activated each two hours during the hurricane alert. UII, at Sabana Seca, has Navy emergency power. GP, Arecibo, has his own 500-watt power plant. DV operated on his own 1½-kw. power plant when the main power failed. The Cuban Emergency Net has announced it will contact the P.R. Emergency Net on 3925 kc. during the present hurricane season as well as on 20 meters during the daytime. EE promises more activity on 75 when he gets the antenna up. ZW reports zero traffic since the ban on DL4 traffic. DV is MARS. Traffic: KP4WT 174, DJ 3.

**CANAL ZONE** — SCM, Roger M. Howe, KZ5RM — SEC: WA. ECs: JD, RV, and QA. RM: DE, PAM: DG. A farewell party was given for KZ5JD at the July meeting of the CZARA. He will make his new home in Venezuela. GF, our QSL Manager, is leaving for a vacation in the Catskills. While he is away RM will take over the files. Organization plans are under way by the ECs to register as many stations as possible for participation in civil defense exercises as members of the Canal Zone AREC. Already 21 operators in the Central and Pacific Areas and 5 from the Atlantic Area have indicated willingness to participate. The traffic circuits between Corpus Christi and the Canal Zone carried news recently of the successful arrival of the eighth baby since Squadron 45 has been

(Continued on page 112)



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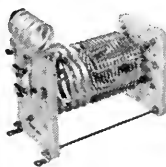
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### SOUTHWESTERN DIVISION

**LOS ANGELES** — SCM, William J. Schuch, W6CMN — SEC: QJW. RMs: BHG and K6DQA. PAM: PIB and YVJ. Summer vacation took its toll, with the gang scattering from here to breakfast. K6BEQ is questing W8AWM about town. NTN put up a 7-Mc. vertical and is DXing. AM vacationed in KL7-Land and worked 5 countries from there. K6ELX vacationed in Mexico as XE1PAC. K6IQF joined the traffic boys. K6KCI assisted with the radio class at summer school. K6HOV has an AF67 and an Adventurer. K6COP now is 144 Mc. TDO is dividing time between 3.5- and 144-Mc. traffic. K6EA still is painting and polishing the shack. K6DQA is looking for help at the County Fair booth. K6EJT is going East for three months. GJP is moving to Oroville. USY has a new 14-Mc. beam and is looking for long-haul traffic. LYG furnished contact for a boys' camp. GYH snagged VP8BD on 14 Mc. LDR is trying to crawl out from under accumulated work after vacation. The Tri-County Amateur Radio Assn. will have a booth at the County Fair. K6JHR is working 21-Mc. c.w. K6HBA has a long wire on 3.5 Mc. NJU is putting up a 60-foot tower and 14-Mc. beam. K6IYF is busy on the Mission Trail Net. HBT has a parakeet that calls CQ. K6IOX and KN6IAV handled traffic for summer camps. K6HMB was on a ranch for the summer. BUK has 21- and 28-Mc. beams. Why not attend the many hamfests this year and meet some of the gang? New officers of the Rio Hondo Club are TTN, vice-pres.; and K6GJU, secy. K6IRY is on 50-Mc. K6HSN is putting up a beam for 50 Mc. K6IMF is mobile with a Globe Scout. K6CHN is 4-Mc. mobile now. The July 24th "assist" given the D.A.C. Sports Car Club "Ken Farrar Rallye" by the ARA of Long Beach was a success with 14 mobiles and four fixed stations at strategic locations doing a great job, as noted on appropriate plaques given in appreciation. Participating were DQD, OZS, UPK, GAU, QPB, GKM, PZV, KTS, CUG, GUD, TTX, KMJ, RUC, UPL, ROP, 9MDS/6, K6CPX, AVQ, CBN, KNP, and ABG. Traffic: W6GYH 304, LYG 118, USY 105, K6EJT 96, W6BHG 86, K6DQA 85, EA 74, HOV 68, W6TDO 56, K6COP 46, KCI 25, W6CMN 14, CAK 12, K6IQF 12, W6ORS 12, K6ELX 9, W6CBO 6, AM 4, NTN 2, K6BEQ 1. (June) W6TDO 69, MLZ 19.

**ARIZONA** — SCM, Albert H. Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZLH, and Dr. John A. Stewart, 78X. SEC: VRB. PAM: KOY. Arizona 'Phone Net: Tue. and Thurs. 7 P.M. MST 3865 kc. Arizona C.W. Net: Tue. and Thurs. 8 P.M. MST 3690 kc. The outstanding event of July was the Powder Puff Derby. While we do not have a complete list of all Arizona participating stations, we know that a great number of messages were handled by Arizona operators. In Tucson, UVR was located at the Municipal Airport as a 75-meter outlet, and was assisted by LAD, MQE, and QHD. Of interest to Novices and Technicians around the State, there now is an organization called the National Novice-Technician Association (NNTA). The appointed head of the W7s is WN7ZSE, Barry Joseph, 4542 East 20th St., Tucson. This organization will maintain a QSL Bureau for Novices; and self-addressed stamped envelopes should be sent to the above address. Write to Barry for further information. HUV received his WAT (Worked All Tucson) certificate. LOC was issued the first WACA (Worked All Central America) certificate to any W Station, and LVR received his WBE (Worked the British Empire) certificate. Traffic: W7UVR 20, LVR 7.

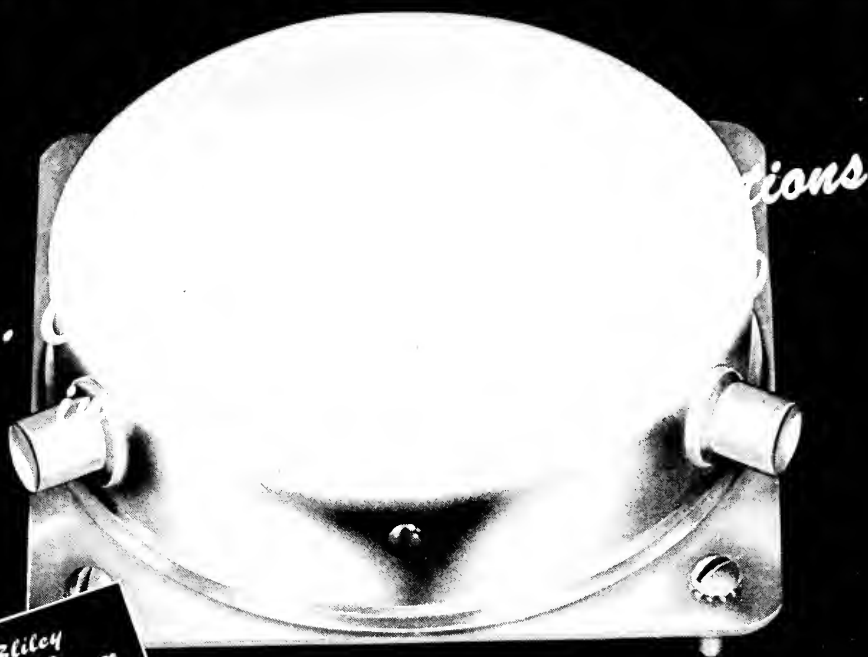
**SAN DIEGO** — SCM, Don Stansifer, W6LRU — The fourth edition of the *San Diego County Amateur Directory*, a project sponsored by the Coronado Radio Club, is off the press and available. More than 1600 amateurs in the county are listed in this fine book. YDK is building an 18 half-wave Sterba curtain directed on the Far East. New officers for the Convair Club are UKU, pres.; K6GIX, vice-pres.; K6AIF, secy.; and K6CZF, treas. GVK has a new jr. operator. The Fullerton Radio Club has an active station, ULI, located at the Fullerton American Legion Hall. Newcomers to North Orange County are 5UPZ/6, IEP, and EVU. JTV, 75 years young, is active in Orange County. KDN is now in Germany. HDT enjoyed fishing in the High Sierras. GCA vacationed in Hawaii and has returned to college. ODR and his XYL flew to Europe this past summer. SEG and BZE have 75A-4 receivers. KSE wrote a book during the summer. K6DAM, W6KNR, LRU, and YVU attended college at San Diego State the past summer. K6DAM and W6LRU received their Masters Degrees. HZN is back in town after a short trip to Africa. SEG is heard on 20-meter c.w. and 'phone working DX with a new Johnston Kilowatt and three-element beam. CHV added VQ6LQ and XW8AB for two new ones. A "well done" to SK for coordinating the many breakfasts at the Division Convention. CUZ fired up on 7 Mc. with an ARC-5 and worked LU, JA, and VK when band conditions were poor. With summer now over your SCM hopes more operators and clubs will report activities regularly

(Continued on page 114)

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or this column. I hope to be more active visiting the clubs in the section this fall, and wish to apologize for the past summer when my paper work got the best of me. Traffic: W6LAB 2175, YDK 1161, K6DBG 36, W6CRT 2.

**SANTA BARBARA**—SCM, William B. Farwell, W6QIW—The Santa Barbara Hamfest held in July was a roaring success, as was Ventura's held in August. K6BVZ is the first RTTY station in Santa Barbara. Sorry to see SBN, the c.w. traffic net, fold up for lack of interest. The Tri County (3820 kc.) and the Peanut Whistle (3860 kc. 'phone) Nets still cover the section for traffic at noon, and ALN (3975 kc.) is a good representation at night. The Ventura Field Day group got its activities "taped" and released over a broadcast station with a swell plug for the hams and their emergency activities. KN6LFQ also was interviewed at KTMS, Santa Barbara, at a later date, giving amateurs another big boost. Tri-County newspapers are opening up with articles and interviews with hams. Public reaction is very favorable. We have good c.d. and AREC groups now with K6KPU, as SEC, ready for any emergency. I am very pleased with the progress made by all clubs in the South Barbara section. There will be a full traffic report next month.

## WEST GULF DIVISION

**NORTHERN TEXAS**—SCM, T. Bruce Craig, W5JQD—SEC: RRM, PAMs: PAK and IWQ. RMs: PCN and QHI. GNE is building the August QST rig. The MOBIL-EARS of Wichita Falls hold drills on 29.1 Mc. each Tue. night and have hidden transmitter hunts each Sun. P.M. Within the last three months K5BIQ, K5BIV, and W5s AGE, DWS, GNE, GVA, KLM, PZS, QJY, QJZ, TLW, and ZAU have installed, principally all-band, mobile rigs. Thanks to MQW for the above news. AHC reports the following heard on the air: IQJ has a new DX-100. ANL is mobile in Colorado. NTC is mobile in New Mexico. AUJ reports the following: SZQ has the B&W 5100 complete with s.s.b. PXI has a new Elmac mobile receiver. TEP is getting an Elmac AF-67 and putting a Fort Worth variable inductor on his mobile. The Blue Ridge Net, on 160 meters, reports 80 per cent attendance for July. AHC went to the track meet at Houston July 24-27. He also participated in the CD C.W. Contest. NVH has his overseas orders. We are glad to get your traffic reports, but please just send a line or two of happenings. KN5BCV broke his collar bone and shoulder blade the day he received his call. DTA is going mobile in August. AWT is finishing a modulator but must build a beam yet. ACK took 3 weeks to build but has an FB Viking Ranger. TTU reports on the activity of the Texas YL Roundup Net each Thurs. on 3880 kc. 0830 to 0930 hours. K5FFB is net control of the Yankee Net, which meets daily on 7290 kc. at 0900 hours. The Dixie Net meets daily at 0800 on 3970 kc. Traffic: K5FFB 620, W5CVA 306, DTA/5 266, KPB 178, AHC 123, BKH 118, PAK 75, BTH 37, ASA 21, CF 20, FJB 16, ACK 11, OCV 8, TFP 7, AWT 5, LTY 4.

**OKLAHOMA**—SCM, Dr. Will G. Crandall, W5RST—Asst. SCM: Ewing Canady, 5G1Q. SEC: KY, RM: GVS, PAMs: PML, SVR, and ROZ. A look at the traffic totals shows clearly the results of hot weather and unfavorable band conditions. Increased openings on the 10-meter band have had a definite effect on the 75-meter band and there have been some indications, such as skip and dead areas, that the 75-meter band will become increasingly poor for daytime operation. The Novice crop has been picking up, as quite a number have been reported around the State, including KN5BXZ and KN5BFX. Also the three ten-year-old licensees in McAlester have gotten their General Class tickets and are heard on the air quite frequently. Several DX-100s are in operation around the State and are putting out good signals. Many hams are reporting from vacation trips and to military and National Guard camps. There was some excellent newspaper publicity from Holdenville on ADC, NVD, PGN, TKI, and WN5BXZ; also publicity on OQT and YL and XYL operators in Oklahoma City, all with pictures. All Asst. Directors got a fine letter from our grand West Gulf Division Director, CF, and he certainly should get the help and cooperation he is requesting. Dad promises a letter at intervals on West Gulf Division doings and in return wants to know of ham needs in the Division. Traffic: (July) W5GWS 132, RST 40, QAC 24, PML 21, TBN 20, ADC 17, PNG 17, EHC 16, GXH 16, MFX 14, BBB 12, MGK 5, CFG 4, UCT 4. (June) W5JXM 50, MFX 19. (May) W5ITF 112.

**SOUTHERN TEXAS**—SCM, Morley Bartholomew, W5QDX—SEC: QEM. AQK is OBS and transmits the latest ARRL bulletins each Mon., Wed., and Fri. at 1800 on 3900 kc. ORG and his XYL and jr. operator visited in Austin the first week of August. Blake is sporting a new Olds Super 88, mobile too. New officers of SARCEN are: THU, ncs; LVE, 1st. alt.; and JHH, 2nd alt. EJT, LVE, and KQG are new members of the Tumble Bug Net. OIK is on 2 meters. YXH has moved to Milwaukee. QEM is rebuilding his 813 rig. WVV has returned from a tour of duty in Germany. The CCARC held Field Day on Padre Island. Those participating were CRO, PPC, INN, LOW.

(Continued on page 116)

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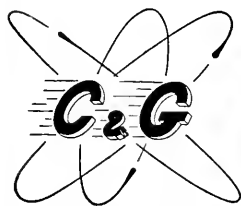


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# QUICK QUIZ

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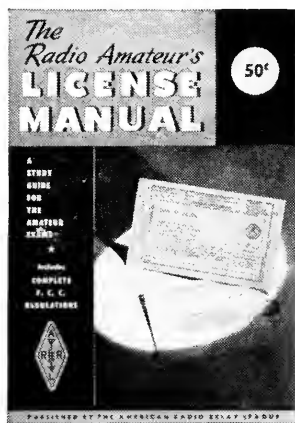
**Q.** What are the procedures to be followed in obtaining an amateur station and operator license?

**Q.** What are the requirements for portable and mobile operation?

**Q.** How do U.S. amateurs obtain authorization to operate in Canada?

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GQN, and 6PWG/5. PPC, DQQ, QEM, and 6PWG/5 all have new 15-meter beams. PAIT is back from Illinois. HQR is c.d. radio officer for Corpus Christi. YJB is attending Texas University this fall. Bill runs 2 watts mobile and really gets out; ask MSA if you doubt it. PC has his mobile in a new Mercury. Zone 1, of STEN, held a picnic in Victoria attended by ONG, TVK, RLZ, EV, MSA, BOY, YJB, MXV, and QEM. GI is now EC for El Paso. ZBK mobile and JN directed the highway patrol and ambulances to a major accident outside Houston. XE2CL visited DTJ. BLA is chasing 20-meter DX on c.w. KSY passed the General Class exam and got married before recovering from the shock. JBY also passed the General Class exam. CTZ, DFA, EPZ, WN5HTE, WN5HTJ, and W5UNZ attended camp with the 49th Armored Division, Texas National Guard, and operated K5WCQ, getting messages to home stations in various parts of Texas. Traffic: W5MN 29, TTY 39, DTJ 10, RKI 4.

**NEW MEXICO** — SCM, Einar H. Morterud, W5FPB — RM: JZT. The NMIEPN meets on 3838 kc. Tue, and Thurs. at 1800 MST, Sun. at 0730. The NM Breakfast Club meets on 3838 kc. daily except Sun. at 0700-0830 MST. The NM C.W. Net meets on 3633 kc. daily at 1900 MST. BJQ joined the Navy and is attending NOCS. WNU received an Armed Forces Day Message certificate. MSG averaged 1.1 p.p.m. in the May Frequency Measuring Test. The Pecos Valley ARC held an outdoor meeting in Carlsbad July 10th. RFF suffered extensive shack damage from rains. RVZ is building a 100-watt rig. MYQ, ZMN, VDY, and GXU demonstrated mobile equipment to the c.d. UFO Patrol activities are being coordinated by CA; amateurs interested in UFO (unidentified flying objects) phenomena are invited to participate in on-the-air UFO Patrol discussions on the low end of 20- and 40-meter c.w. Listen for the call "UFP." If this report seems to be mostly Albuquerque activity each month it is because no one sends in any items and it is necessary to use information that we know about locally. This report is on YOUR activities. Traffic: K5FEF 218, FHU 37, W5BZB 20, CEE 17, RVZ 4, WNU 2.

## CANADIAN DIVISION

**MARITIME** — SCM, Douglas C. Johnson, VE1OM — Asst. SCMs: FRIT, A. Webb, 1DB; Aaron D. Solomon, 1OC. SEC: R.R. Bouquets to the LCARC of Saint John and the NBARA for jointly sponsoring the ARRL Canadian Division Convention held at Saint John on July 30th and 31st. It was attended by 152 amateurs and XYLS (YLs). Outside visitors included VE2NJ, VE2OS, VE1KN, W2VDS, W2EWO, and W7RVN. Guests of honor were W1BDI, VE2BE, the mayor of Saint John, the C.D. Director, and the R.I. Activities included a meeting of the NBARA, an ARRL meeting, banquet, speeches, presentation of cups, guessing contests, a c.w. speed contest, initiation into the Royal Order of the Wouff Hong, hidden transmitter hunts, a tour of the city, and a picnic. Over 20 mobile set-ups were in attendance, which is a record. W1BDI gave an excellent demonstration of his 75- and 2-meter mobile equipment. Personally, the Hamfest was one of the best I have ever attended, and all hats are off to the LCARC and NBARA! OC and his XYL made a trip to VE7-Land. XK is doing FB with a new Ranger transmitter. WL is having success with his new mobile set-up. WB has been reelected president of the NBARA. Musician ER did a fine job at the hamfest sing-song. Traffic: VE1FQ 236, UT 83, WK 31, ME 28, OM 4, BN 1.

**ONTARIO** — SCM, G. Eric Farquhar, VE3IA — YJ/3 operated at Queen's Park, London, during that city's Centennial. Personnel located at Civil Defense Headquarters were AJH, QC, BVM, AOO, and YJ. BHK visited old haunts and CAB. AAS now is mobile. AOE now is located in Kirkland Lake. At the Ontario Phone Club picnic, held at Collingwood recently, the following were elected: TX, pres.; RII, vice-pres.; DMI, secy. AML is recuperating from a hospital session. BRI, who did much work in forest-fire fighting service as a pilot, was hospitalized because of a car accident. The newly-appointed QSL Manager for this section, QE, has many cards awaiting self-addressed envelopes. Please assist him by sending yours in today. The Algoma Amateur Radio Club held a ham family picnic on St. Joseph's Island near the Soo. Being a definite success it is likely to become an annual affair. DUY and ANH did a yeoman job with its arrangements. AWR was heard on two meters from Port Dover. AVS completed WAC and reports on the tremendous forest fires and drought. OMs and XYLS of the Hamilton District paid tribute to BIK at a gathering on the shore of Lake Ontario. BIK has moved to Peterboro, a true loss to Hamilton. Good luck, OM. Traffic: VE3NG 140, AJR 76, VZ 51, DQX 50, GI 48, NO 45, DPO 31, KM 27, AUU 22, BUR 19, PH 16, DH 6.

**QUEBEC** — SCM, Gordon A. Lynn, VE2GL — DR continues to hold forth with others on PQN thrice weekly despite the summer fall-off. DR has a new SX-96 receiver which he likes better the more he becomes familiar with

(Continued on page 118)

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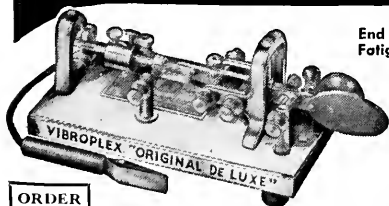
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all it will do. FL reports the Northland Net continues to meet on 3755 kc. at 1915 Wed.; also that a meeting was held at the shack of AMY to celebrate the opening of his newly-built 160-watt transmitter on 10, 20, 40, and 80 meters and to bid adieu to OB, who was leaving that district. BR spent July at his summer place with portable and mobile from that location. BK also was at his summer place getting the odd QSO, which is usually interrupted by children who want to play! LM also is operating from his summer place at Vale Perkins and manages to get in a bit of traffic. OP participated in the recent Frequency Measuring Test with gratifying results. Traffic: (July) VE2LM 48, DR 46, FL 16, (June) VE2DR 54.

**ALBERTA — SCM,** Sydney T. Jones, VE6MJ — PAM: OD, RM: XG. Congratulations to the Southern Alberta Radio Club on the well-planned hamfest. While the attendance was down from the usual it was most enjoyable for all who attended. OD has gone for 8-mm. movies. PS, JP, PV, and YE are new Official Phone Stations. YE and his NYL are back after an extensive trip to British Columbia and Saskatchewan. JP is QRL working over his modulator. YN swept the gremlins out of the rig when MJ visited the shack. EH and his NYL are on a trip to California. YD is working on the organization of the Central Alberta Mutual Aid Net. HM has had VE8YO visiting him. IIX was a recent visitor to Calgary. LQ is making progress on his new rig. LS is ready to go mobile. Monthly reports to your SCM for publication in this column are urgently needed, gang. Please send your news in, otherwise I am unable to find the dope to fill the necessary space. Traffic: VE6HM 143, OD 38, VE7HD 12, VE6MJ 8.

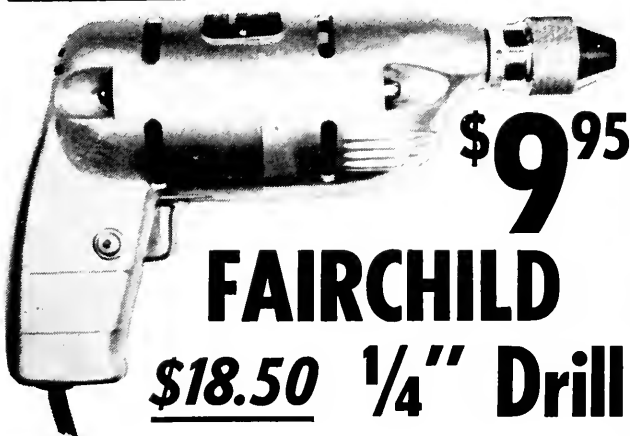
**MANITOBA — SCM,** John Polmark, VE4HL — OO: RB. JW's new signals show what an antenna can do. NW portable is doing well again this year. Thanks to the few who kept the noon and evening nets going throughout the summer months. Now is the time to make application for an appointment. Inquire as to the one you can qualify for and can handle. RA has a brand-new jr. operator, born July 10th. We haven't heard that big signal from DS yet. TQ was a recent visitor to the southern parts. When do we hear that kw. Ed? CX must have left television alone lately as he has heard on 75-meter mobile quite a lot. LOO, our tractor mobile, still is having trouble with the transmitter. Traffic: VE4AI 26, GE 22, QD 6, GB 5, AY 4, CB 4, KG 4, EF 3, VE5DS 3, VE4HC 2, JW 2, RC 2, YR 2, VE5GO 2.

## Silent Keys

It is with deep regret that we record the passing of these amateurs:

WN1EIM, Raymond Cox, Middlebury, Vt.  
W1KK, Thomas P. Chapman, West Springfield, Mass.  
W1LFF, John N. Stanley, North Wilmington, Mass.  
W2EHD, Warren C. Brady, Brushton, N. Y.  
W2QGQ, Martin Peterson, Butler, N. J.  
W2WPD, Robert Lewis, Islip, L. I., N. Y.  
W2ZKB, Albert Gottlieb, Pleasant Valley, N. Y.  
W3CSQ, Laurence W. Harry, Chevy Chase, Md.  
W3EQ, Walter J. Deery, Havertown, Penna.  
W4NYD, Dallas E. Vaughn, Middlesboro, Ky.  
W5GWA, Wade Smith Luckett, Springfield, Ark.  
W6ANT, Hullett H. Honeywell, Chatsworth, Calif.  
K6DVA, George P. Willner, San Leandro, Calif.  
W6DZH, ex-W1CCZ, Edward C. Crosssett, Pasadena, Calif.  
W6EUI, Roy S. Skaggs, Bakersfield, Calif.  
W6YYG, Frank Leake, Glendale, Calif.  
W7AWG, Claude E. Boden, Bellevue, Wash.  
W7IEY, Louis Dspain, Empire, Ore.  
W7TQ, Evert Rodenhouse, Seattle, Wash.  
W7UM, Gerald F. Alcorn, Longview, Wash.  
W8BKQ, Earl A. Shulenberger, sr., Fremont, Ohio  
W8NAM, Edward Lockhart, sr., Princeton, Ohio  
W9BII, Roy Baskett, Rushville, Ill.  
W9UIM, Murray Bingham, Sturgeon Bay, Wis.  
W9DJT, Melvyn R. Wright, Fergus Falls, Minn.  
W9PPZ, Walter A. Haeussinger, Winona, Minn.  
W8SWC, Arne F. Rova, Janestown, N. Dak.  
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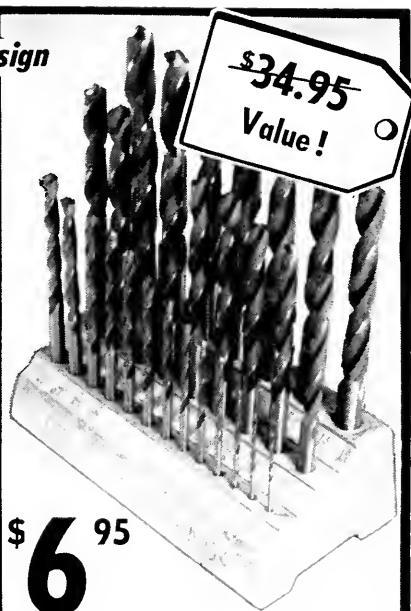
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- 3 1/2" extension bar for above
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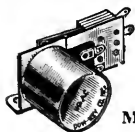
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## MIDGET ALL-PURPOSE POWER

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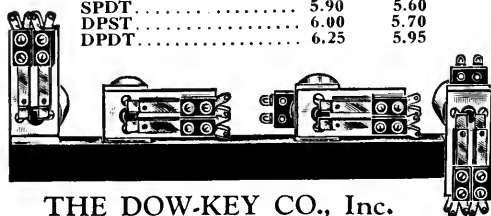
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DPST.....		6.00	5.70
DPDT.....		6.25	5.95



THE DOW-KEY CO., Inc.  
WARREN, MINNESOTA

## Medium-Power Transmitter

(Continued from page 19)

chart and parts list were calculated to provide a Q of about 12 in the plate tank circuit, for a plate-voltage/plate-current ratio of about 13:1 (2000 volts, 150 ma.). Departure from this ratio will make it necessary to change some of the values of the tank components if a Q of 12 is to be maintained.<sup>6</sup> Ideally, the transmitter should work into a 50-ohm antenna or an antenna coupler that will present 50 ohms to the transmitter, but reasonable variations can be compensated for nicely by juggling the loading capacitors and the value of L<sub>14</sub>. A little time invested in getting the transmitter adjusted to a particular antenna will pay off in signal reports.

TABLE II  
Tune-Up Chart

(Values are approximate)

Band	C <sub>14</sub> (Dial)	C <sub>15</sub> (Dial)	L <sub>14</sub> (μh.)	Output (μf.)
80	95	90	26.0	600
40	23	50	14.5	300
20	82	25	8.2	200
15	15	15	6.0	100
10	5	10	2.3	100

As mentioned earlier, the rig described here has been in use for over a year, on 80, 40, and 20 for the most part, and has been a pleasure to operate. Changing bands is a simple process, and is done very quickly—a great help in the SS contest. Living in a relatively strong TV-signal area, with a TV antenna about every 50 feet in all directions as far as the eye can see, not a single TVI complaint has been received to date. This includes our own TV set, the antenna for which is about 10 feet from the 20-meter ground plane, the mast of which also serves to hold up one end of the 80/40-meter horizontal antenna.

Many complimentary reports have been received on the keying and no clicks can be heard off frequency, even by the nearest locals. Operation is full break-in, and since a TVG unit<sup>7</sup> has been installed in the station receiver, switching from receive to transmit involves only the movement of the hand to and from the bug.

Application of Tekni-Cals to the front panel, plus careful layout has resulted in what we feel is a "finished" look.

The author would like to acknowledge with gratitude the contributions made by W2RDK, W2HSZ, and K2EOC during the design and construction of this rig, and the patience of my XYL, who puts up with this sort of thing.

<sup>6</sup> A 100-μf. tank capacitor is sufficient over the plate-voltage range of 600 to 3000 (assuming a plate current of 150 ma., and a 50-ohm load in each case) for all bands except 80 meters. On 80 meters, 100 μf. is adequate for 2000 volts or more. A 150-μf. capacitor is recommended for plate voltages down to 1000, while a 200-μf. unit should be provided if operation down to 600 volts is contemplated. Also, for 80-meter operation into a 50-ohm line, an output capacitance adjustable up to 900 or 1000 μf. would provide greater assurance of obtaining a proper match.—Ed.

<sup>7</sup> Miller and Meichner, "TVG—An Aid to Break-In," QST, March, 1953.

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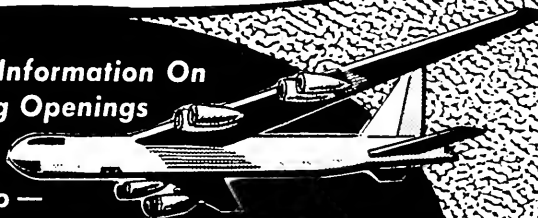
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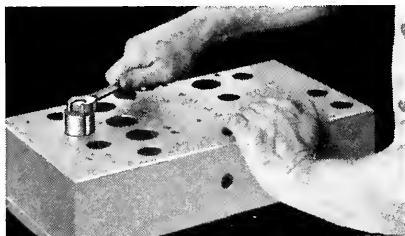
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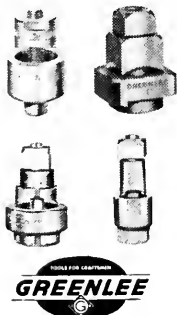
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Readers are sure to ask, "Why didn't you put in an r.f. stage?" (or an i.f. amplifier, or make provision for plug-in coils, or build a voltage-regulated power supply, or install a panel, or — or — or). To this we reply that for once we tried to make a usable converter that would be devoid of any feature not absolutely necessary to provide reception on the bands to be covered. This is "the simplest"; if you want de luxe features you can take it from here.

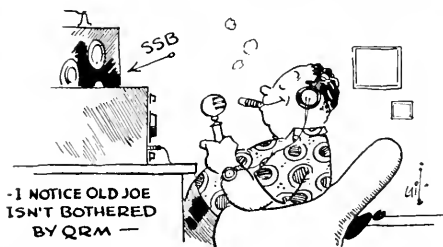
## Wait and See

(Continued from page 31)

getting. "Yeah," he says, with a sour look, "I've been listening to you lately but if I have to have a note like a bunch of sparrows just to get to talk with some guy a little farther away than I can get normally I'll be dogged if I don't jest lock up the shack and take up photography." If I had been set up with store teeth then I sure would have dropped my uppers. The guy meant it! I know he did because a year later he was off the air and so help me he has never returned.

It makes me sad to think about Old Bill. He had one of the best fists on the air and more fun with his hamming than any three hams are entitled to have. But he had an opinion and he defended it even to the point of dropping his hobby. I have always thought he just couldn't endure the thought of learning a new set of techniques in order to hold his own with the rest of the gang. After all, spark operation was simple and the new c.w. method was much more complicated by comparison. Oh well, I've seen many Old Bills in other fields and I guess there's nothing I can do about them even if they do make me sad.

Along about last year Old Joe went single sideband. Now the whole gang of locals are saying mean things about him and his "rubber-voiced" 'phone communications. They say he is taking up too much of the band and I'm kinda inclined to agree with them when I'm listening to a.m. on my receiver. But you know, I notice he doesn't have the least bit of trouble with QRM



when the rest of the band is so cluttered with a.m. signals there isn't a place to light.

(Continued on page 126)



# Please Rush

COMPLETE INFORMATION ON ITEMS CHECKED!

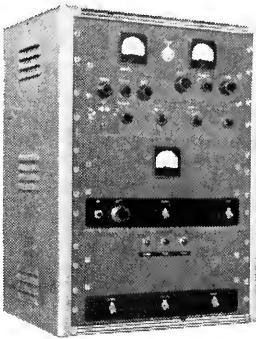
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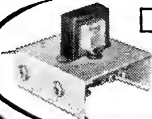
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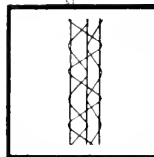
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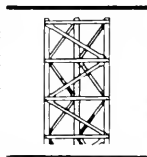
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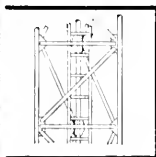
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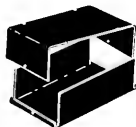
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Progress is necessary and it must come. The s.s.b. boys tell some fantastic stories about the wonders of their 'phone method. Their stories are almost too good to be true and I can't help but be suspicious of them. If what they say is even partially true, s.s.b. does represent progress. It looks to me as though all this fuss about s.s.b. is because the new method is gumming up the old. When c.w. came along, it was the old method which interfered with the new. But the new method was the better method. It represented progress and it did win out, but it took several years to win the boys over.

It seems to me as though both sides in this s.s.b.-a.m. row have a few new tricks to learn. It seems the s.s.b. boys need to be very sure their rigs are clean and the a.m. boys have a few more things to learn about their receivers. It'll take time for the row to be decided, but all concerned should wait and see. Many on-the-air friendships will be broken up by the a.m. vs. s.s.b. row. Many of the voices which are now so familiar as I tune across the band will no longer be heard. It makes me sad to see this history repeating itself. Seems it is just my bounden duty to ask both sides to be patient if the urge to spout off about opinions comes along. Seems I've just got to ask all the boys to say as little as possible to hurt the other fellow until time gives us the answer. Wait until time does give that answer, please!

You know, since QRM is so heavy, it would be foolish to get into this subject on the air. I believe I'll just give Old Joe a call on the land line so I can go and sit with him and really look into this s.s.b. business first hand. It might need a lot of looking into.

## Mobile Antenna Tuning

(Continued from page 33)

as far back against the front seat as possible. This location keeps the control within easy reach, although nothing of the cable is in sight. The hole in the car-body floor is also hidden and is easily covered when the installation is removed. No fastener or adapter could be found for the cable at the tuner end, so it was merely clamped to the car body about a foot from the tuner.

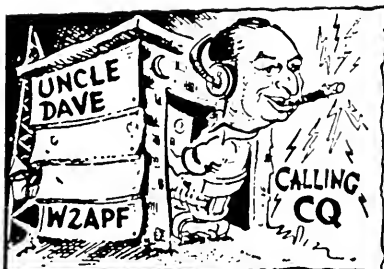
In connecting the line that runs between the thermocouple on the unit and the r.f. ammeter on the dash board, be sure to observe the polarity markings on both the thermocouple and the meter.

## Adjustment

Operation of this unit is so simple and straightforward that little explanation is necessary. However, a few pointers may be helpful in getting best results on the first trial. Mount the unit as close as possible to the receptacle at the base of the antenna. Prune the loading coil so that about five turns of the rotocoil are in the circuit at the high-frequency end of the band. This will mean about seven turns less on the Hi-Q type Master-Mount coil, or slightly more on coils of

(Continued on page 128)





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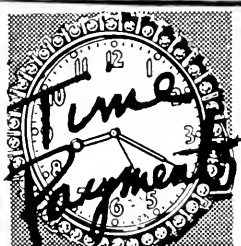
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smaller diameter. Here is where a grid-dip meter comes in handy, although the job is by no means impossible using just the transmitter tuning indicator and the antenna-current indicator. Now try tuning the antenna to the low end of the band by means of the tuner. You will be surprised at how few more turns of coil are necessary. It is advisable to mark each end of the band on the dial of the tuner with paint or white ink. After these adjustments are made, operation consists only of tuning the transmitter and then tuning the antenna for maximum indication of the r.f. ammeter. It may be found that with very low-power transmitters (10 watts or less) there is only a slight indication of current at exact resonance. Meter deflection can be increased by adjusting the leads to the meter transformer so that slightly more than one turn surrounds the core.

As might be expected, the entire system works equally well for receiving. The antenna change-over relay should be placed in or near the transmitter.

**"Little Oskey"**

(Continued from page 35)

the unit becomes inoperative.

With  $S_2$  closed, everything is ready. When the key is up the receiver is heard; when the key is down a sidetone is heard and the transmitter is keyed. The oscillator tone level can be adjusted with the gain control on the unit, while the receiver level is controlled at the receiver. If the station being worked wishes to break in, his signals can be heard between the characters being transmitted.

Since the receiver is actually on during key-down conditions (even though it appears to be off in the headphones), care should be taken not to damage the receiver by r.f. overloading. The monitor has been used successfully at WICUT with a cathode-keyed transmitter running as high as 200 watts input. For simplicity, separate transmitting and receiving antennas are used. The unit cannot be used with grid-block keyed transmitters — it is designed for cathode-keyed rigs only.

If the transmitter and receiver are turned off the monitor can be keyed and used as a code-practice oscillator. The sidetone will appear in the headphones as the unit is keyed.

**Strays**

K2KTX tells us that during an operation, K2IWT was reported to have been tapping out code while unconscious from the effects of the anesthesia. Evidently K2IWT is one fellow who does not have to worry about learning the code subconsciously.

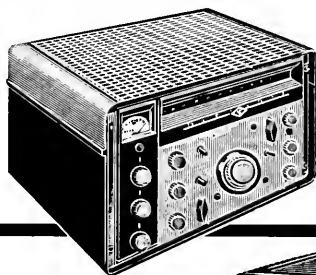
— . . . —

With the election of W4FE as SCM of Eastern Florida, all elected officials in the Southeastern District have two-letter calls.



**"Butta, I Donta Know Anybody In Australia. Cana We Go, Now?"**

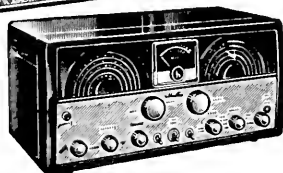
There is only one source you need to know when it comes to super trades on used (factory-built) test and communication equipment and that's Walter Ashe, the House of "Surprise" Trade-Ins. So for real money saving and satisfaction, get your trade-in deal working right now. Wire, write, phone or use the handy coupon below. Do it today!



**ANNOUNCING  
NATIONAL'S  
NEW DREAM  
RECEIVER—  
THE GREAT NC-300**  
Less speaker.  
Net \$349.95

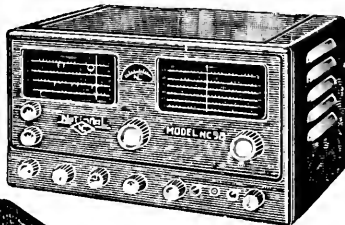


**HALLICRAFTERS  
SX-100.**  
Less speaker.  
Net \$295.00

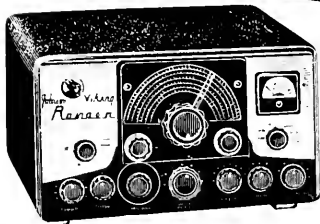


**HALLICRAFTERS  
SX-99.**  
Less speaker.  
Net \$149.95

**NATIONAL NC-98.**  
Less speaker.  
Net \$149.95



**JOHNSON VIKING  
RANGER TRANSMITTER-  
EXCITER KIT.**  
Net \$214.50. Wired and  
tested. Net \$293.00



**WELLER MODEL 8100K SOLDERING KIT.**



Includes soldering gun,  
wire soldering brush,  
soldering aid, and a  
supply of Kester  
solder. Packed in heavy  
cardboard case.  
Net \$5.83

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**Walter Ashe  
RADIO CO.**  
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**FREE CATALOG!**

WALTER ASHE RADIO COMPANY  
1125 Pine Street, St. Louis 1, Missouri Q-10-55  
☐ Rush "Surprise" Trade-In Offer on my \_\_\_\_\_  
for \_\_\_\_\_  
(show make and model number of new equipment desired)  
☐ Rush New 1956 Catalog.  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

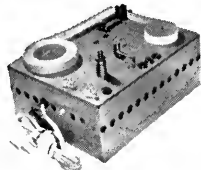
**Send  
for  
your  
copy  
today**

**W1BFT**  
**CALLING ALL**  
**HAMS**  
*offers you!*  
**HYDRO-AIRE**  
**TRANSISTORS, DIODES, ETC.**  
 We stock the CQ-1 featured in the August edition of QST. "Little Gem", page 16.  
**YOUR COST—\$2.50**  
 For the latest in equipment,  
**CONTACT US FIRST!!!**  
**YOUR FRIENDLY SUPPLIER**

**Evans RADIO**  
 P.O. BOX 312 • CONCORD, N. H.

## What Is This Thing Called the "Hump" in CODE?

**T**HE *hump* (around 8 words) is the thing that tells you you have wasted your time by starting out wrong. Thirty years ago when we started teaching Code our students too ran head-on into the *hump*. We went to work to find out why. TWO-PHASE, STEP BY STEP instruction is the perfect answer. In this method dotdash is not A. The SOUND resulting from dotdash is A. There is also the important factor of correct timing. If the signals are not timed correctly the resulting sound will not be correct. There are many, many things connected with proper Code instruction, many of them so small they seem inconsequential. Others are so technical that many so-called experts fail to understand them. It's a long story but I have it all written up and will be glad to send it to you. A postcard will bring you the full story.



**TELEPLEX CO. 415 G. St., MODESTO, CALIFORNIA**

**MAIL THIS COUPON for** Q-5  
**FREE INFORMATION about the**  
**FINEST IN MOBILE ANTENNA EQUIPMENT**

VAARO DIV., DAVIS ELECTRONICS  
 BOX 1247, Burbank, California

SIRS: RUSH INFORMATION TO ME AS CHECKED:

☐ Send CATALOG INFORMATION and DATA on VAARO MOBILE ANTENNA EQUIPMENT.

☐ Send Address of NEAREST AMATEUR JOBBER.

Name.....

Street.....

City..... State.....

## AT-1 Modifications

(Continued from page 39)

while holding the key down. If the amplifier is neutralized, the grid current will drop to zero and the lamp bulb will go out. Hold the key down only for a second or two when making these tests, because the amplifier tube draws excessive current when it has no grid excitation.

If grid current is present with the crystal removed it indicates that the amplifier is oscillating and must be neutralized. Hold the key down and adjust  $C_N$ , the neutralizing capacitor, to a setting that shows no grid current on the meter. Use a small insulated screw driver to adjust the neutralizing capacitor.

When the amplifier is neutralized on 80 meters, reinsert a 40-meter crystal and tune the rig up on 15. Make the same tests and follow the procedure as on 80. If the amplifier is not already neutralized on 15, the setting of  $C_N$  should not have to be changed very much to stabilize the amplifier. When the amplifier is neutralized on 15, it should be stable on all bands. It is not necessary to neutralize on 10 meters because the amplifier works as a frequency doubler.

## Additional Information

In its modified condition, the transmitter can be used with 80-meter crystals for 80, 40, and 20. A 40-meter crystal will take care of 40, 20, 15, and 10. In the 15-10-meter position, the oscillator tuning is near minimum capacitance for 15 and near maximum for 10 (20-meter drive to the amplifier on this band).

A very noticeable keying chirp was present both before and after modification, most of it being caused by the change in oscillator screen voltage between the key-up and key-down conditions. The change was minimized by connecting a 68,000-ohm 1-watt resistor from Pin 6 of the oscillator tube socket to chassis ground.

To convince yourself that the modifications described here are worth while, try this test: Before making any changes, connect a 40-watt lamp bulb to the output terminal and tune the rig up on each band, observing the brilliance of the lamp. After the modification, go through the same procedure. You won't need dark glasses, but you should be pleasantly surprised by the difference in output. And don't forget — transmitters may be rated by input, but it's the output that works 'em!

## COMING A.R.R.L. CONVENTIONS

October 15th-16th — Central Division, South Bend, Ind.

October 22nd-23rd — Midwest Division, Omaha, Neb.

(Details on page 10)

# Use Your Military Training

**The time was never more opportune than now for becoming associated with the field of advanced electronics. Because of military emphasis this is the most rapidly growing and promising sphere of endeavor for the young electrical engineer or physicist.**

*E.E. or PHYSICS GRADUATES  
with experience in  
RADAR or ELECTRONICS  
or those desiring to enter these areas . . .*

Since 1948 Hughes Research and Development Laboratories have been engaged in an expanding program for design, development and manufacture of highly complex radar fire control systems for fighter and interceptor aircraft. This requires Hughes technical advisors in the field to serve companies and military agencies employing the equipment.

As one of these field engineers *you will become familiar with the entire systems involved*, including the most advanced electronic computers. With this advantage you will be ideally situated to broaden your experience and learning more quickly for future application to advanced electronics activity in either the military or the commercial field.

Positions are available in the continental United States for married and single men under 35 years of age. Overseas assignments are open to single men only.

Hughes-equipped  
Convair F-102  
all-weather  
interceptor.

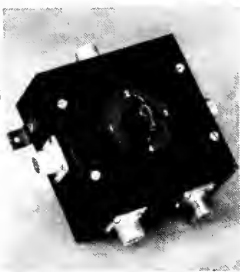
*Scientific  
Staff  
Relations*

## Hughes

**RESEARCH  
AND DEVELOPMENT  
LABORATORIES**

*Culver City,  
Los Angeles County,  
California*





Four position rotary switch for co-axial cables.

Switch to any of four antennas or three antennas and dummy load.

Low SWR 1.75 to 30 Mc. 5  
amps of RF in any fixed  
position. 1000 volt ins.

Amateur net \$5.50 kit form  
\$7.50 wired & tested

Available in Little Gem: Model BLG-1 trans-  
istorized "Little Gem" (See Aug. QST cover)

MYRON ANTHONY BOB VIRKUS  
W9TPU W9MRW

If not yet at your distributor's, order  
directly from

**BLACKSTONE ELECTRIC CO Inc.**  
561 HILLGROVE LA GRANGE, ILLINOIS

## LEARN CODE!

SPEED UP Your  
RECEIVING  
with G-C

Automatic Sender

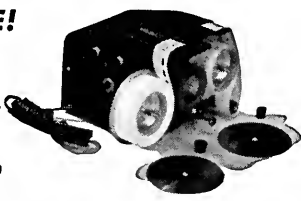
Type S  
\$28.00 Postpaid in  
U. S. A.

Housed in Aluminum Case Black Instrument Finished. Small—  
Compact—Quiet induction type motor. 110 Volts—60 Cycle A.C.

Adjustable speed control, maintains constant speed at any Set-  
ting. Complete with ten rolls of double perforated tape. A wide  
variety of other practice tapes available at 50c per roll.

**GARDINER & COMPANY**

STRATFORD NEW JERSEY



check this feature  
on the new **SX-100**



\$295.00

See Your Hallicrafter Jobber Today

"TEE-NOTCH"  
FILTER

**hallicrafters**

CHICAGO 24,  
ILLINOIS

## World Above 50 Mc.

(Continued from page 71)

over a 3-year period. Signals have been recorded from several  
other outlying stations on vertical, and checks will be made  
on these when their horizontal installations are completed.

**W7JRG, Billings, Mont.**—Double-hop 6-meter DX  
scarce this summer, but plenty of single-hop heard and  
worked. Provided 50-Mc. WAS for W0DZM. Two-meter  
beam severely damaged by hailstorm; will be replaced  
when new tower is erected.

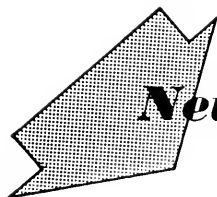
**W7YJE, Seattle, Wash.**—Six-meter mobile activity  
increasing. W7s PRW UFE TMM VIC LUF and YJE  
now all mobile.

**W8NOH, Grand Rapids, Mich.**—Acquiring a supply of  
crystals between 7600 and 7900 kc. brought need for sure-  
fire way to shift them to above 8000 kc. At suggestion of  
W8DX, tried saturated solution of ammonium bifluoride  
in water. This is available in flake form at low cost. Mix in  
plastic container, and handle with care, as the water solution  
will cause burning of the skin. Etching at the rate of one-half

(Continued on page 134)

## 2-METER STANDINGS

Call			Call		
States	Areas	Miles	States	Areas	Miles
W1RFU...	19	7 1150	W6WSQ...	5	3 1380
W1HDQ...	7	1020	W6DNG...	4	3 350
W1CHH...	17	5 670	W6ZLN...	3	3 1400
W1IZY...	16	6 750	W6BAZ...	3	2 320
W1UIZ...	16	6 680	W6NLZ...	3	2 360
W1LEO...	16	5 475	W6MMU...	3	2 240
W1KCS...	16	5 600	W7LEE...	5	3 1020
W1AZK...	14	5 650	W7VMP...	3	417
W1MNF...	14	5 600	W7JUL...	4	2 353
W1BCN...	14	5 650	W7YZU...	3	2 240
W1DJK...	13	5 520	W7JUC...	3	2 140
W1MMN...	10	5 520	W7RAP...	2	1 165
W2ORI...	23	8 1000	W8WXX...	28	8 1200
W2NLY...	23	7 1050	W8LPD...	23	8 —
W2AZL...	21	7 1050	W8SVI...	22	8 725
W2QED...	21	7 1020	W8RMH...	22	8 690
W2BLV...	20	7 910	W8IDX...	22	7 675
W2OPQ...	19	6 —	W8SRW...	20	8 850
W2DWJ...	18	6 632	W8WRN...	20	8 670
W2AOC...	18	6 660	W8BAX...	20	8 685
W2UTH...	17	8 800	W8JWV...	19	8 710
W2PAU...	16	6 740	W8PCP...	18	7 800
W2PCQ...	16	5 650	W8ZCV...	17	7 970
W2LHI...	16	5 550	W8RWV...	17	7 630
W2CFT...	15	5 525	W8WSE...	16	7 800
W2DFV...	15	5 550	W9EHN...	24	7 725
W2AMJ...	15	5 550	W9FVJ...	23	8 850
W2BRV...	15	5 550	W9BPV...	23	7 1000
W3RUE...	23	8 950	W9EQC...	22	8 820
W3KCA...	21	7 —	W9KLR...	21	7 090
W3NKM...	19	7 660	W9UCB...	21	7 750
W3IBH...	19	7 650	W9ZHL...	21	7 —
W3RBC...	18	7 750	W9KPS...	19	7 660
W3EPH...	18	7 —	W9MUD...	19	7 640
W3TDF...	18	6 720	W9REM...	19	6 —
W3GKP...	17	6 800	W9LF...	19	7 800
W3KWL...	16	7 720	W9ALU...	18	7 750
W3LNA...	16	7 720	W9GAB...	18	7 750
W4HHK...	28	9 1280	W9JGA...	18	6 720
W4AO...	23	7 950	W9WOK...	17	6 600
W4PCT...	20	8 —	W9MBI...	16	7 660
W4JFV...	18	7 830	W9BOV...	15	6 —
W4MKJ...	16	7 665	W9LEE...	15	6 780
W4UMF...	15	6 600	W9DSP...	15	6 760
W4OLK...	15	6 720	W9JNZ...	15	6 560
W4OXC...	14	7 500	W9DDG...	14	6 700
W4JHC...	14	5 720	W9FAN...	14	7 680
W4WCB...	14	5 740	W9QKM...	14	6 620
W4TCR...	14	5 720	W9JY...	13	6 560
W4UBY...	14	5 435	W9ULA...	12	7 540
W4IKZ...	13	5 720	W9ZAD...	11	5 700
W4JFU...	13	5 720	W9GTA...	11	5 540
W4TLV...	13	5 700	W9JBF...	10	5 760
W4UDQ...	11	5 850	W9EMS...	26	8 1175
W4ZBU...	10	5 800	W9HDP...	24	7 870
W4WNL...	10	5 500	W9GUD...	22	7 1065
W4LIQ...	10	4 500	W9ONQ...	17	6 1090
W4MDA...	10	4 680	W9INT...	14	6 830
W5RCI...	21	7 925	W9OAC...	14	5 725
W5JTL...	19	7 1000	W9TJE...	13	4 —
W5AJG...	13	4 1260	W9ZJB...	12	7 1097
W5CAN...	10	5 1400	W9WCZ...	11	5 760
W5CVW...	10	5 1180	VE3DIR...	22	7 700
W5ABN...	10	3 780	VE3AIB...	21	8 890
W5MWW...	9	4 570	VE3DER...	15	7 800
W5ML...	9	3 700	VE3BON...	14	7 790
W5ERD...	8	3 570	VE3BPH...	13	6 715
W5EEK...	8	2 580	VE2AOK...	12	5 550
W5VX...	7	4 —	VE3AQC...	11	7 800
W5VY...	7	3 1200	VE1QY...	11	4 900
W5ONS...	7	2 950	VE7FJ...	2	1 365
W5FSC...	7	2 500			



## New gear you're looking for?

... you're sure to find it at Burghardt's!

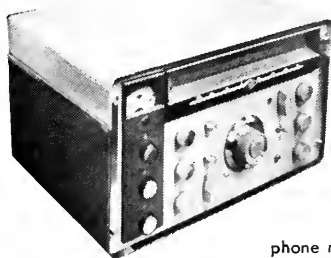
**Terrific Trade-Ins**—As liberal as anyone in the country ... and yours may be worth more at Burghardt's. Trade-ins usually cover down payment on your new gear.

### 10% Down—Easy Terms

—10% down lets you "take it away." Up to 18 months to pay on balances over \$200. Burghardt's financing saves you money—adjusts terms to your budget. All time payments based on local bank rates. Full payment within 90 days cancels interest.

### Speedy Delivery—Personal Attention

—No order too large or small for personal attention. All inquiries acknowledged and orders processed day received.



### N—E—W

**NATIONAL NC-300**—Brand new from top to bottom, here is National's new "dream receiver", the NC-300. Dual conversion with better than 50 db primary rejection on all amateur bands—more than 60 db secondary image rejection. 10 dial scales for 160 to 1 1/4 meter coverage—extra long slide rule dial easily readable to 2 kc without interpolation up to 21.5 mc. Super selectivity—optimum bandwidth for CW, phone, phone net, or VHF operation. Separate linear detector for single sideband. Giant, easy-to-read "S" meter.

Massive in appearance. Finished in attractive two-tone grey enamel. May be used as a rack or table model unit. Complete with all tubes.....

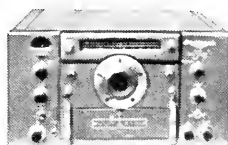
**\$19.07** per month for 18 months.

ONLY  
**\$34.95**  
DOWN

**NATIONAL 183-D**—Outstanding in design—top performance even under most severe receiving conditions. Calibrated electrical bandspread for 80-75, 40, 20, 15, 11-10 and 6 meters. 3 IF stages; 16 tuned circuits. Better than 1.5 microvolt sensitivity for 6 db signal-to-noise ratio throughout the entire range.

With tubes, less speaker.....  
**\$21.77** per month for 18 months.  
Matching 10" speaker. Housed in metal cabinet.....

ONLY  
**\$39.95**  
DOWN



**NATIONAL HRO-60**—One of finest, most up-to-the-minute receivers available. Dual conversion above 7 mc; 2 RF stages. Sensitivity is 1. microvolt or better at 6 db signal-to-noise ratio. 1.7 to 30 mcs. Bandspread on 80, 40, 20, 11-10 meters. Excellent selectivity and high sensitivity. Complete with all coils and tubes.....

**\$29.15** per month for 18 months.

ONLY  
**\$53.35**  
DOWN

**NATIONAL NC-98**—Complete with crystal filter and an "S" meter! Two models available—electrical bandspread calibrated for SWL or amateur bands. Edge-lighted dial scales—noise limiter—separate high frequency oscillator. A quality unit at a real budget price. Covers 550 kc to 40 mc.....

**\$8.12** per month for 18 months—Matching speaker.....

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**\$14.95**  
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### TOP TRADE-INS!

Write for our latest bulletin. We have hundreds of standard brand pieces of equipment in our trade-in department—used equipment made by Johnson, National, Collins, Hallcrafters, Gonset, Elmac, Harvey-Wells, Morrow, Central Electronics, and other leading names.

Our prices on trade-ins are realistic and down to earth. In addition where purchase is for cash with no trade-in, an additional 10% discount is allowed on used equipment only. Burghardt's financing plan tailored to your budget can be used for the purchase of new as well as used equipment.

73,

Stan Burghardt W0BJV

"Your confidence is our most valuable asset!"

# Burghardt RADIO SUPPLY

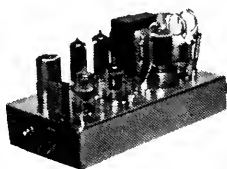
P. O. Box 746, Watertown, South Dakota • Phone 749



## TWO METER TRANSMITTER • CONVERTER

Area of the Base is  
58% of the size of  
this Page

Area of Base is  
68% of the size of  
this Ad.



LW-50—

- Crystal Controlled Converter
  - 7-11, 14-18 Mc or BC output
  - BC IF for Mobile or Nets
  - Only 5 ma total B+ drain
- Completely wired and tested with tubes, crystal and coax plugs.

**\$18.50**  
Postpaid



See QST May '54, pp. 47-48  
or write for literature.

Fixed or Mobile  
• 15 Watt Transmitter  
• Crystal controlled  
• Speech for Crystal or Carbon Microphone  
• Push-pull Modulators with Speech Clipping  
Pre-assembled Kit  
LW-50K \$34.50  
Wired and tested  
LW-50 \$54.50  
Crystals \$2.00  
6 Tubes \$10.50  
AC Power Supply \$29.95

**ELECTRONIC LABORATORY**  
ROUTE 2, JACKSON, MICHIGAN

check this feature  
on the new  
**SX-100**



\$295.00

NOTCH DEPTH  
CONTROL

See Your  
Hallierafter Jobber Today

**hallicrafters** CHICAGO 24,  
ILLINOIS

**WANTED**

**MEN TRAINED IN ELECTRONICS, inter-  
ested in career with established company  
furnishing offshore electronic surveying  
service in Gulf Coast area. First or Second  
Class radiotelephone license required.**

For further information write

**LORAC SERVICE CORPORATION**  
P. O. Box 6842, Houston, Texas

kilocycle per minute in cold solution can be accelerated to two kc. per minute by heating. Remove crystals from solution and rinse in clear water to stop etching process. Few crystals lose activity in the amount of etching required.

**W8UZ, Columbus, Ohio**—Opening of 50-Mc. band to Technicians brought about 25 new stations to the band in Columbus area, with more coming.

**W9EET, Chicago, Ill.**—Ten days of operating on 50 Mc. in Lincoln, Nebr., beginning July 4th, netted 116 contacts in 26 states.

### Another Communicator Hint

In June QST we described a method for using the Gonset Communicator as a converter with a communications receiver as the i.f. This involved retuning of the i.f. system slightly, so it might scare off a potential user. (The i.f. is broad and the adjustment is in no way critical.) W1EOI goes us one better by wrapping an insulated wire around the leads to the noise-clipper switch, poking this through the back screen on the Communicator so that it protrudes about one inch. A piece of coax is connected between this wire and the communications receiver, in the usual manner. Enough i.f. energy on 6 Mc. is thus made available to give a reading, on noise alone, of S6 on W1EOI's NC-183 S-meter. No readjustment of the i.f.s is needed, and the wire may be pulled out, leaving the unit in exactly its original condition.

### DX Contest Results

(Continued from page 68)

#### DELTA DIVISION

Louisiana		N.Y.C.-L.I.	
W5JUF.....	23,287- 73-108-C-	W2WZ.....	173,160-156-370-C-6
W5KC.....	6930- 42- 55-B-11	K2CJN.....	10,212- 46- 74-A-22
W5CEW.....	6765- 41- 55-C-	W2BRV.....	4200- 35- 40-B-10
W5BVD.....	1320- 20- 22-B-12	W2SGK.....	1474- 22- 23-C-
W5INL.....	675- 15- 15-A-	K2DEM.....	297- 9- 11-B- 4
		W2GSN.....	27- 3- 3-B- 1
		K2CMV.....	3- 1- 1-B- 2

#### Tennessee

W4DQH.....	119,915-145-277-C-57	Northern New Jersey	
W4FKA.....	25,718- 77-112-B-41	W2SKE/2....	439,356-228-650-C-96
		W2GLF.....	19,032- 61-104-C-25
		W2BOK.....	960- 16- 20-B- 4
		K2IKS.....	3- 1- 1-A- 1

#### GREAT LAKES DIVISION

Kentucky		MIDWEST DIVISION	
W4KZF.....	2673-27- 33-B-10	Iowa	
Michigan		W0DIB.....	264- 8- 11-B- -
W8RLT.....	89,916-127-236- B-45	W0QVZ.....	27- 3- 3-B- 1
W8DUS.....	67,041-117-191- C-	W0NWX (W0s FNR NWX PKH	
W8PRY.....	144- 6- 8- -	VDQ).....	18,207- 63- 90-B- -
W8QIT.....	27- 3- 3- C- 6	Kansas	
W8DLZ.....	12- 2- 2- B- 2	W0QFQ.....	10,665- 45- 79-B-34
W8NGO (W8s CLR NGO)	91,432-129-236- -80	W0MVO.....	5076- 36- 47-B-15
W8NWO (W8s HMI NWO)	74,466-126-197-AB-95	W0VBQ.....	2511- 27- 31-C-14
Ohio		W0IUB.....	648- 12- 18- -
W8NXF.....	101,178-146-231- B-67	W0GAX.....	6- 1- 2-A- -
W8LKH.....	88,832-128-232- C-54	W0EIB (W0s EIB OCP)	23,079- 49-157-C-72
W8ZOK.....	40,860- 90-152- B- -	Missouri	
W8YHO.....	32,766- 86-127- B-32	W0CEK.....	15,698- 47-112-B-39
W8PUD.....	20,700- 60-115-BC-53	W0MCX.....	7488- 39- 64-C-28
W8AJW.....	17,670- 62- 95- A- -	W0QDF.....	1080- 18- 20-C- -
W8BF.....	16,302- 66- 83- C- -	W0ANF.....	168- 7- 8-C- 2
W8BTI.....	12,654- 57- 74- C-35	W0LLU.....	126- 6- 7-A- 4
W8FGX.....	10,260- 45- 76- C- -	Nebraska	
W8KZT.....	5580- 30- 62- -	W0GKL.....	9636- 44- 73-C-30
W8HQK.....	3556- 28- 43- B- -	W0BBS.....	6090- 35- 58-C-13
W8LOF.....	390- 10- 13- A- 5	NEW ENGLAND DIVISION	
W8HFE.....	144- 6- 8- -	Connecticut	
W8PM.....	75- 5- 5- 2	W1ATE.....	492,184-238-690-C-94
W8GDO.....	45- 3- 5- B- 7	W1ODW.....	12,879- 53- 81-A- -
W8OMK.....	27- 3- 3- -	W1CJL.....	2304- 24- 32- -20
W8BKP (W8s BKP WFB)	133,569-153-291- C-75	W1APA.....	360- 10- 12-C-10
		W1YYP.....	108- 6- 6-A-10
		W1YWU.....	27- 3- 3-B- -
		W1ZMB.....	8- 2- 2-B-15

#### HUDSON DIVISION

Eastern New York	
W2VRE.....	12,012- 52- 77-BC-30

(Continued on page 136)

# LAFAYETTE'S SPECTACULAR MONEY SAVERS

*Argonne*

## TRANSISTOR TRANSFORMERS

AT LAST A COMPLETE LINE OF QUALITY TRANSFORMERS FOR EVERY TRANSISTOR APPLICATION AT A PRACTICAL PRICE!

**2.75 each**  
Lots of 10 Assorted  
**2.95** Singly, each

Nickel-Steel and Silicon Steel Laminations • Wound on Nylon Bobbins • Mylar Outer Wrap Color Coded Leads Have you been experimenting with transistor circuits? And have you been forced to make-do with compromise transformers or improvised units? And have you had to pay from \$6.00 to \$12.00 for them? The Argonne line brings you a wide variety for experimentation as well as for replacement. Efficiently designed to meet the needs of miniaturization and engineered to provide more power handling capacity and improved frequency response with minimum distortion. All nickel-steel laminations except asterisk which are silicon steel. Average net weight 1 1/2 oz., average shipping wt. 4 ozs.

Argonne Number	Type	Impedance Primary Ohms	Second- ary Ohms	Unbal- anced Current Pri. D.C. MA	D.C. Resistance Pri. Ohms	Sec. Ohms	Overall Size
AR-100	Input	200,000	1,000	0	3600	90	1 1/2" x 3/4" x 1/2"
AR-101	Input	100,000	5,000 CT	.5	3600	60	1 1/2" x 3/4" x 1/2"
AR-102	Input	100,000	1,500 CT	.5	3600	40	1 1/2" x 3/4" x 1/2"
AR-103	Driver	20,000	2,000 CT	1	400	50	1 1/2" x 3/4" x 1/2"
AR-104	Driver	20,000	1,000	.6	400	50	3/4" x 3/4" x 1/2"
AR-105	Driver	20,000	400	1	600	30	1 1/2" x 3/4" x 1/2"
AR-106	Driver	15,000	4,000	1	620	350	3/4" x 3/4" x 1/2"
AR-107	Driver	15,000	200	1.5	1000	20	1 1/2" x 3/4" x 1/2"
AR-108	Driver	10,000	3,000 CT	0	200	100	3/4" x 3/4" x 1/2"
AR-109	Driver	10,000	2,000 CT	0	500	50	3/4" x 3/4" x 1/2"
AR-110	Output	10,000	25	2	600	2.5	3/4" x 3/4" x 1/2"
AR-111	Output	5,000	100	1	600	10	3/4" x 3/4" x 1/2"
AR-112	Output	3,500	200	1	120	25	1 1/2" x 3/4" x 1/2"
AR-113	Driver	3,000 CT	1,000	9	100	60	3/4" x 3/4" x 1/2"
AR-114	Output	2,500	11	10	30	1	3/4" x 3/4" x 1/2"
AR-115	Input	2,000 CT	8,000 CT	0	150	650	1 1/2" x 3/4" x 1/2"
AR-116	Output	2,000	200	1	120	20	1 1/2" x 3/4" x 1/2"
AR-117	Output	500 CT	30	.6	20	1.5	3/4" x 3/4" x 1/2"
AR-118	Output	500 CT	16	0	20	1.5	3/4" x 3/4" x 1/2"
AR-119	Output	500 CT	3.2	0	20	.3	3/4" x 3/4" x 1/2"
AR-120*	Output	400 CT	11	1	20	.9	3/4" x 3/4" x 1/2"
AR-121*	Output	300 CT	3.2	.6	20	.25	3/4" x 3/4" x 1/2"
AR-122*	Output	250 CT	3.2	0	11	.3	1 1/2" x 3/4" x 1/2"
AR-123	Input	200	2,000 CT	2	11	50	1 1/2" x 3/4" x 1/2"
AR-124*	Output	200 CT	16	0	20	1.3	3/4" x 3/4" x 1/2"
AR-125	Input	3	4,000	.0	.11	50	3/4" x 3/4" x 1/2"

**NEW**



**TRANSISTOR  
TYPE 2N107  
P-N-P**



**\$1.25**

**RAYTHEON TRANSISTORS**

**SALE!**

**CK-722  
RAYTHEON**

CK-722—Singly, each..... 2.10  
—In lots of 10, each..... 1.95  
CK-721—Singly, each..... 2.40  
—In lots of 10, each..... 2.25

**High Output  
Dynamic  
Microphone**



List Price  
**\$47.00**  
**\$12.95**  
High quality Dynamic microphone exceptionally fine for Public address recording, etc. Flat response 60-10,000 cps. Impedance 40,000  $\pm 15\%$  at 1,000 cps output level —55 db. Die cast metal case equipped with 6 ft. of shielded cable. Shpg. wt. 3 lbs.  
PA-19—in lots of 3 ..... 12.45  
singly, ea. .... 12.95

**TOP QUALITY  
CRYSTAL  
MICROPHONE**



COMPARE IT WITH  
ANY MIKE AT 2 to 3  
TIMES THE PRICE  
A quality crystal Microphone for A-A systems, house recorders, etc. Frequency response 30 to 10,000 cycles Output level —52 db. Provides ample output for use with low gain amplifiers. Complete with 5 ft. of shielded cable. Shpg. wt. 3 1/2 lbs.  
PA-24—in lots of 3 ..... **\$3.95**  
singly, each ..... 4.25

**LAPEL  
MICROPHONE**



• REGULAR \$16.00 VALUE!  
• FULL —55 db.  
OUTPUT LEVEL!  
• IDEAL GENERAL  
PURPOSE WIRE!  
**2.95**  
Specially engineered crystal Microphone Attaches to lapel. Only 1 1/8" in diameter. Exceptional frequency response. Output level —55 db. chrome plated case and clip for attaching to lapel. Includes 5 ft. of shielded cable. Shpg. wt. 1 lb.  
PA-18 ..... 2.95

**MAKE YOUR OWN  
PRINTED CIRCUIT  
NOTHING ELSE TO BUY!**

Our Inexpensive Etched-Wire Kits Contain: Laminated Copper Boards (XX-P); Printed Circuit Tube Sockets; Copper Etching Material and Instructions; Etch-resistant material for Circuit layouts; Eyelets and drill for connections; Sealed layout sheets for making your own or standard Printed Circuits. All Kits Are

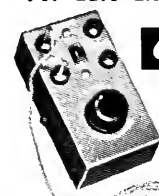


Supplied with Plastic Case  
**5001P—BASIC KIT** ..... **3.95**  
Contains a complete assortment of materials needed to make a variety of different Printed Circuits. Circuit Diagrams include Multimeter and 1-tube Receiver.  
**5003P—SERVICEMAN & TECHNICIANS' KIT** ..... **9.75**  
Contains three times the material of Kit 5001P with special sockets, connectors and double-faced Copper Boards.  
**5004P—PRODUCT DESIGNERS' KIT** ..... **25.00**  
This special Kit enables the Manufacturer and Laboratory to make a pilot run of etched wire Printed Circuits with his own staff and facilities. Contains all the latest information, materials and methods for adapting your product to mass production techniques.

**REMOTE CONTROL FOR  
SILENT TV VIEWING**

The hard-of-hearing can listen to radio or TV without turning the volume so high that others can't stand the noise. They can listen with loud speaker cut off, or if others want to listen, with normal speaker volume. Excellent for noisy programs. Let the Kids listen and view with speaker cut off. Comes complete with miniature phone, fits snugly in ear, 20 feet of cable and instructions.  
MS-125 ..... 6.50  
TWO CAN LISTEN WITH ADDITIONAL EAR PHONE ..... 1.95

• For Hard-of-Hearing  
• For Late Listening



**6.50**

**TRANSISTOR 455KC I.F. 1/2"x1/2"x3/4" H**

This tiny I.F. is the same as used in the transistorized sets of the leading manufacturers. Ideal for building miniature equipment.  
MS-126—Single, each..... 89c  
In lots of 10, each..... 79c

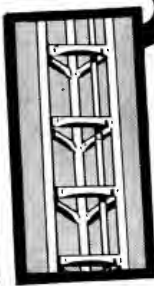
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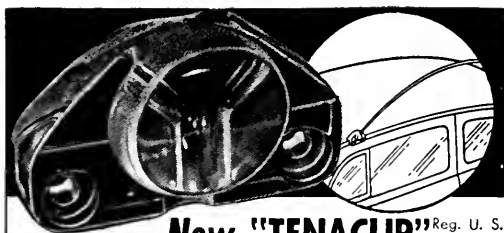


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**attaches to car... stops antenna whipping**

Clear plastic clip quickly fastens to rain molding... holds right or left antennas. Prevents damage to antenna from low hanging limbs or driving into garage. See your dealer or order direct. No C.O.D.'s please.

**\$198**

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postpaid

### Maine

W1DLC..... 35,076- 74-160- -60

### Eastern Massachusetts

W1PST..... 42,581- 77-186-C- -  
W1ONK..... 23,925- 55-145-B- 8  
W1MKW..... 216- 6- 12- - 4  
W1MX(W1s VUW YFM, W4YHD,  
W5ZID, VE2ALP).....  
8512- 38- 76-C-27

### Western Massachusetts

W1ZD..... 6660- 37- 60-C-11  
W1CLX..... 5310- 30- 59-B-10  
W1YQC..... 1674- 18- 31-B-22  
W1KfV..... 270- 9- 10-B- -

### Vermont

W1SPK..... 216- 8- 9-B- 4

### SOUTHWESTERN DIVISION

#### Alabama

W4HA..... 15,028- 52- 97-C-23

#### Eastern Florida

W4EEO..... 1587- 23- 23-B-10  
W4APY..... 1296- 17- 24- -12  
W4LQN..... 495- 11- 15-A-15

#### Western Florida

W4AFS..... 7560- 36- 70-A-38

#### Georgia

W4EEE..... 100,602-138-243-C-62  
W4PGZ..... 2688- 28- 32-B- 7

### SOUTHWESTERN DIVISION

#### Los Angeles

W6YY..... 233,444-148-526-C-81  
W6VSS..... 99,231- 97-341-C-36  
W6HJK..... 4524- 26- 58-A-25  
W6NJU..... 3528- 24- 49-A-15  
K6AUZ..... 60- 4- 5- - 2  
W6AM (W6s AM BXL KPC  
QMC)..... 124,413-113-367-C- -  
W6BJU (W6s BJU CUF).....  
9660- 35- 92-C-16  
K6BFC (K6s BFC EAP).....  
3510- 26- 45-A-40  
W6BAB (W6s OKJ VEB, K6s  
CJT CVL GPJ GPK).....  
1134- 14- 27-C-48  
W6UYW (W6UYW, K6DUH).....  
3- 1- 1-A- 1

#### Arizona

W7VMP..... 13,005- 51- 85-C-28  
W7PZ..... 1404- 18- 26-B-15  
W7ENA..... 18- 2- 3-A- 4

#### San Diego

W6CHV..... 31,275- 75-139-B-40  
W6CTP..... 15,600- 52-100-C-35  
K6BEC..... 150- 6- 9-B-40  
W6GBG..... 126- 6- 7-B- 5  
K6CUZ/6..... 3- 1- 1-A- 1  
K6DNO/6..... 3- 1- 1- 1

### PACIFIC DIVISION

#### Nevada

W7VIU..... 405- 9- 15-B-10  
W7JUO..... 270- 9- 10-C- 3

#### East Bay

W6IDY..... 59,040- 93-205-C-64  
W6LDD..... 1098- 18- 21-C- 6  
W6KEK..... 540- 9- 20-B- -

#### San Francisco

W6CBE..... 7215- 37- 65-B-21  
W6ATO..... 1302- 14- 31-C-10

#### Sacramento Valley

W6GVM..... 5490- 30- 61-C- -  
W6GHG..... 1248- 13- 32-C- -  
W6HIR..... 900- 15- 20- -13  
W6WZD (W6s WYR WZD).....  
66,848- 78-287-C-63

#### San Joaquin Valley

W6EFV..... 1215- 15- 27-B- 4

### ROANOKE DIVISION

#### North Carolina

W4CVX..... 5168- 38- 46-B-10  
W4UXI..... 108- 6- 6- - 2

#### South Carolina

W4TWW..... 36,288- 84-144-B-62

#### Virginia

W4KWY..... 282,540-204-463-C- -  
W4OM..... 214,884-188-381-C- -  
W4CBQ..... 55,872- 97-192-C-54  
W4NQM..... 14,766- 46-107-C- -

#### West Virginia

W8UMR..... 810- 15- 18-B- 6

### ROCKY MOUNTAIN DIVISION

#### Colorado

W8SBE..... 6726- 38- 59-C-32

#### Utah

W7QDJ..... 2584- 19- 46- -25

#### Wyoming

W7PSO..... 1008- 12- 28-B-20

### WEST GULF DIVISION

#### Northern Texas

W5KUJ..... 7920- 44- 60-C-80  
W5QF..... 2706- 22- 41- -11  
W5ZUL..... 1817- 23- 27-B-30  
W5BJA..... 390- 10- 13-A- 5  
W5DXW..... 390- 10- 13- -13  
W5VNW..... 3- 1- 1- 1

#### Oklahoma

W5ALB..... 29,187- 69-141-B-43

#### Southern Texas

W5KBP..... 62,496-112-186-C-56  
W5SU..... 5760- 32- 60-B-40

#### New Mexico

W5FTP..... 742- 14- 19- B-10  
W5DWT..... 216- 8- 9-AB- 4

### CANADIAN DIVISION

#### Maritime

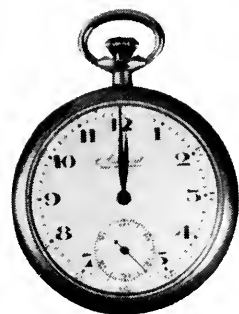
VO6N..... 4455- 27- 55-B-35  
VO6U..... 2310- 22- 37-B-15  
VE1CU..... 429- 11- 13-A-12  
VO1D..... 351- 9- 13-A- 8  
VE1HG..... 75- 5- 5-B-10

#### Ontario

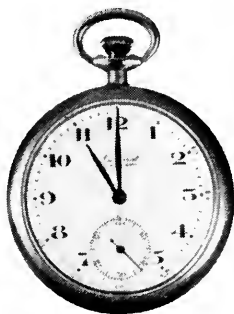
VE3ARS..... 22,425- 65-115-B-31  
VE3BDB..... 15,600- 52-100-B-29  
VE3IR..... 1716- 22- 26-B-36  
VE3DKH..... 1386- 21- 22-A-14  
VE3DNE..... 147- 7- 7-A- 5  
VE3RCS (VE3s ATU CWB DTM).....  
56,158- 86-218-B-96

(Continued on page 138)

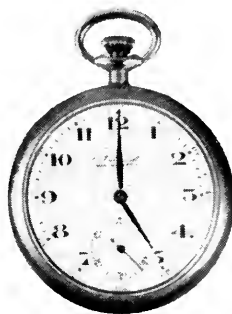
**WORK 'EM ACROSS THE TIME ZONES**



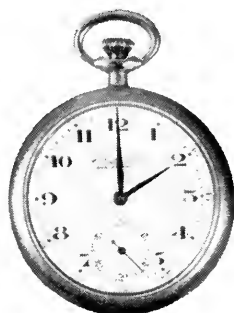
W6



VQ4



VP8



T19

*with the newest*

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W6NKI  
K6DPH  
W6YML  
W6YPA

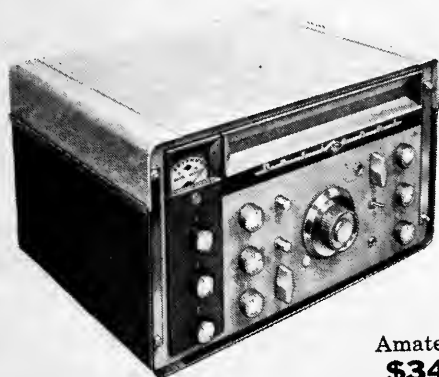
W6VBY  
W6VCR  
W6LD  
K6CRD  
KN6JMM

W60YD



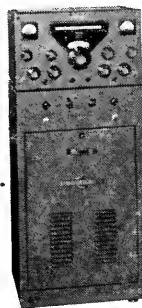
**Hallicrafters SX-96 Receiver** AM • CW • SSB  
Standard bdest and 3 SW bands (1720 KC to 34 MC). Dual conversion. Selectable sideband. Temp. compensated.  
Amateur net: complete with tubes, wired and tested (less speaker) **\$249.95**.  
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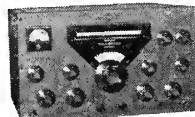


Amateur Net:  
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Order now for immediate delivery



**Collins KWS-1 Xmt**  
1 KW peak power. CW, AM, SSB all at the flick of a switch. VFO exciter. VOX and push-talk control. Grid block keying. Amateur net: complete with tubes, wired and tested **\$1,995**.



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AM • CW • SSB  
160, 80, 40, 20, 15; 11 & 10 meters Dual conversion.  
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Amateur net: **\$20**.

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with a

# GENERAL CRYSTAL 5 BAND DOUBLET ANTENNA

● Designed for use with all multi-band transmitters of 1 Kilowatt or less.

● Complete with 80 feet of KW lead-in and instructions.

**NET**

No. 5BA-F Complete phoneband antenna **\$24.95\***

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No. 5BC-F Coils only for phone bands **\$14.95\***

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**MONEY BACK GUARANTEE**

**GENERAL CRYSTAL CO., INC.**

**Antenna Division**

**434 Wilmot Ave. Burlington, Wis.**

Manufacturers of quartz crystals for all applications from 6 KC to 150 MC.

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With both gold border and lettering, and with black enamel background, is available in either pin (with safety clasp) or screw-back button type. In addition, there are special colors for Communications Department appointees.

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**RADIO OPERATOR'S LICENSE  
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VE2APC.....	23,562- 63-126-B-18	OH1PN.....	135- 5- 9-A- -
VE2JR.....	9360- 45- 70-B-36	OH6NR.....	105- 5- 7-A- -
<i>Alberta</i>		OH3RA.....	3- 1- 1-A- 1
VE6NX.....	4316- 26- 56-B-37	<i>France</i>	
<i>British Columbia</i>		F8SK.....	12,012- 14-286-A-34
VE7ZM.....	462- 11- 14-A- 3	F9RM.....	567- 7- 27-A- -
VE7APV.....	99- 3- 11- -21	F8UM.....	378- 7- 18-A- -
<i>Manitoba</i>		F3NG.....	120- 5- 8-A- 5
VE4RO.....	49,128- 92-178-C-56	F9DW.....	3- 1- 1-A- 1
<i>Saskatchewan</i>		<i>Germany</i>	
VE5GF.....	2142- 21- 34-B-20	DL1KB.....	8211- 17-161-B-34
VE5VZ.....	420- 10- 14-B-15	DL4DX.....	1107- 9- 41-B-18
<i>AFRICA</i>		DL6XZ.....	644- 7- 32-A-15
<i>Canary Islands</i>		DL5TW.....	120- 4- 10-A- -
EA8AX.....	546- 13- 14-A- -	<i>Gibraltar</i>	
<i>French Morocco</i>		ZB2A (G3s DBT GFM, BRS	20,186).....
CN8EB.....	357- 7- 17-A- 2		12,213- 23-183-B-19
<i>Liberia</i>		<i>Italy</i>	
EL2X.....	81,405- 45-603-B-45	I1BDV.....	12,483- 19-219-B- -
<i>Madeira</i>		I1TDJ.....	2136- 12- 60-A-10
CT3AE.....	6831- 23- 99-A-24	<i>Liechtenstein</i>	
<i>Mozambique</i>		HB1MX.....	3388- 11-103-B- 7
CR7AF.....	105- 5- 7-A- -	<i>Malta</i>	
<i>Southern Rhodesia</i>		ZB1DK.....	1014- 13- 26-A-10
ZE2KR.....	9675- 25-129-A-20	<i>Netherlands</i>	
<i>Spanish Morocco</i>		PA0ULA.....	2457- 13- 63-B-13
EA9AR.....	13,524- 23-196-A-16	PA0XD.....	2301- 13- 59-A- 8
<i>Tangier Zone</i>		PA0VB.....	990- 10- 33-B- -
KT1UX.....	357- 7- 17-B- 1	PH1RRS.....	891- 11- 27-B-16
<i>Union of South Africa</i>		PA0UV.....	520- 8- 22-B- -
ZS6DW.....	41,140- 44-313-A- -	PA0OTC.....	54- 3- 6-A- -
ZS6FN.....	1050- 10- 35-A- 4	PA0ZGD.....	3- 1- 1-A- 1
ZS6AIY.....	459- 9- 17-A- -	<i>Norway</i>	
ZS6AFE.....	384- 8- 16-A- 7	LA5YE.....	1632- 17- 32-B-12
<i>ASIA</i>		LA4KD.....	582- 6- 34-A- 9
<i>Japan</i>		<i>Portugal</i>	
KA20J.....	3531- 11-107-B-16	CT1SQ.....	46,440- 40-389-B-44
JA1VP.....	450- 3- 50-A-12	CT1PK.....	10,890- 22-165-B- 9
JA4BB.....	450- 5- 31-B- 4	<i>Scotland</i>	
JA1AGU.....	141- 3- 16-B- -	GM3GCH.....	13,248- 6- 10-B- -
JA3MD.....	52- 2- 9-A- -	<i>Spain</i>	
JA1GV.....	45- 3- 5-B- 2	EA4DL.....	27,552- 28-328-B-06
JA3BU.....	18- 6- 1-B- 1	EA4DR.....	13,248- 23-194-B- -
JA2AH.....	3- 1- 1-A- 1	<i>Sweden</i>	
JA3BB (JA3s BB DM)	162- 3- 18-B- 3	SM5FA.....	2844- 12- 79-B- -
<i>Lebanon</i>		SM2VP.....	168- 4- 14-A- 2
OD5AB.....	336- 7- 16- - -	<i>Trieste</i>	
<i>Saudi Arabia</i>		I1BNU.....	1290- 10- 43-A-16
HZ1AB.....	234- 6- 13-B-20	<i>NORTH AMERICA</i>	

## EUROPE

<i>Austria</i>		<i>Barbados</i>	
OE13USA.....	16,548- 21-263-B-34	VP6WR.....	127,098- 69-625-A-40
<i>Belgium</i>		<i>Bermuda</i>	
ON4OC.....	7140- 14-173-A-23	VP9L.....	66,317- 47-471-B-41
ON4LJ.....	528- 8- 22-B-10	<i>British Honduras</i>	
<i>Czechoslovakia</i>		VP1GG.....	22,932- 28-273-A-14
OK1NB.....	2377- 13- 61-A- -	<i>Canal Zone</i>	
<i>Denmark</i>		KZ5DJ.....	16,302- 26-209-B- -
OZ5KP.....	3648- 16- 76-A-18	KZ5WZ.....	696- 8- 29-B- -
OZ7BG.....	1254- 11- 38-A- 7	<i>Cocos Island</i>	
OZ7G.....	567- 9- 21-A- 8	TI9MHB.....	14,580- 30-162-B- 6
<i>Eire</i>		<i>Cuba</i>	
EI5I.....	14,560- 20-243-B-24	CO2BM.....	13,338- 26-171-A- -
<i>England</i>		CO2EC.....	3828- 22- 58-B- -
G2PU.....	9774- 18-181-B- 9	<i>Guantanamo Bay</i>	
G3DO.....	5831- 17-115-B-17	KG4AJ.....	55,044- 44-117-B-48
G3HJJ.....	432- 9- 16-B- -	<i>(Continued on page 140)</i>	

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### MILLEN GRID DIP OSCILLATOR

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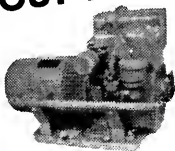
## RENT IT!

by the week at moderate rate.

Stop wasting your valuable RF power! Order now, or ask for rental application. (CLUBS! Split the cost, with a "TUNE-UP PARTY".)

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IR's type B2M.  
(See pg. 11, Sept. QST)  
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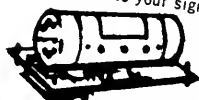
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XE1PJ ..... 270- 6- 15-B- 1

### Nicaragua

YN4CB ..... 49,545- 45-367-A -

### Panama

HP3FL ..... 73,017- 57-429-B-15

### St. Pierre and Miquelon

FPSAP ..... 9620- 20-161-A -

### Turks and Caicos

VP5AE ..... 47,880- 38-421-A-26

### OCEANIA

#### Australia

VK2GW ..... 6240- 24- 87-A-25  
VK5XN ..... 795- 5- 53-A  
VK5WO ..... 18- 1- 6-A- 1

#### Hawaii

KH6LJ ..... 162,486- 59-918-C-64  
KH6PM ..... 90,576- 48-629-B-54  
KH6AXH ..... 59,040- 40-492-A-60  
KH6MG ..... 35,100- 35-325-C-22  
KH6SP ..... 25,248- 32-263-B -  
KH6ANK ..... 609- 7- 29-A -

#### New Zealand

ZL1BY ..... 32,289- 47-229-A-29  
ZL1MQ ..... 17,427- 37-157-A-23

#### Philippine Islands

DU7SV ..... 2460- 10- 82-B -

#### Western Caroline Islands

KC6CG ..... 18- 2- 3-A-16

### SOUTH AMERICA

#### Antarctica

VP8BD ..... 1368- 12- 38-B -

### Archipelago of San Andres and Providencia

HK0AI ..... 15,433- 23-229-A

### Argentina

LU1EQ ..... 63,300- 50-432-B-43  
LU7BQ ..... 17,496- 36-162-A-22  
LU9AV ..... 6318- 26- 81-A -  
LU4DMG ..... 315- 5- 21-B -

### Brazil

PY2CK ..... 10,413- 39- 89-C- 6  
PY4OF ..... 1920- 10- 64-A -

### British Guiana

VP3HAG ..... 15,930- 30-177-A-15

### Chile

CE2GG ..... 5478- 22- 83-B-24  
CE6AB ..... 3081- 13- 79-B -

### Ecuador

HC1PJ ..... 3942- 18- 73-B-11

### Netherlands West Indies

PJ2AF ..... 101,475- 55-621-A-42

### Paraguay

ZP5CF ..... 2592- 12- 72-A -

### Trinidad

VP4BN ..... 28,700- 35-274-B-22

### Uruguay

CX2CN ..... 4692- 23- 68-A-21  
CX2BP ..... 378- 7- 18-C -

### Venezuela

YV5DE ..... 2159- 17- 43-B -  
YV5BJ ..... 495- 9- 19-B- 3

<sup>1</sup> Hq. staff — not eligible for award. <sup>2</sup> W6VUW, opr. <sup>3</sup> W7VMQ,  
opr. <sup>4</sup> W6CRV, opr. <sup>5</sup> F9AINE, opr.

ARRL thanks these amateurs for submitting their logs for checking  
purposes: C.F. — W1s GDY KFY MAN MTG, W2s FE FMP  
GYQ NOY, K2s EQD JZT, W3s AAL AIV HTK PEV, W4s FSA  
LYV VE, W5HDS, W6s JYN WZD, W7s CRC EWR MO, W8s  
PNE TKR, W9PRM, VE3DGX, VE5CX, VE6SX, VE7FC,  
KL7BBV, SM5VN, SM6BDS; Phone — W1KSK, W2s FE FMP  
VUM, K4AHW, W3s GAH ZWR, W9UKG, W9BUR, VE6FI,  
VE7EB CX2CF, EI6G, VP7NG.

## Strays

The Civil Aeronautics Administration an-  
nounces openings for electronic engineers in their  
New York and Washington headquarters. Those  
employees working out of New York will be in-  
volved in the engineering, installation, and mod-  
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directional ranges, instrument landing systems,  
airport surveillance radar, precision approach  
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clusion of design and specification writing, and  
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The New York openings involve considerable  
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moderate travel. Per diem of \$12.00 a day will be  
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ployees assigned outside the headquarters city.

Salaries are from \$4345 to \$6390. For specific  
information regarding qualifications, contact per-  
sonnel officer, Civil Aeronautics Administration,  
Federal Building, N. Y., International Airport,  
Jamaica, N. Y., or Civil Aeronautics Administra-  
tion, Washington 25, D. C.



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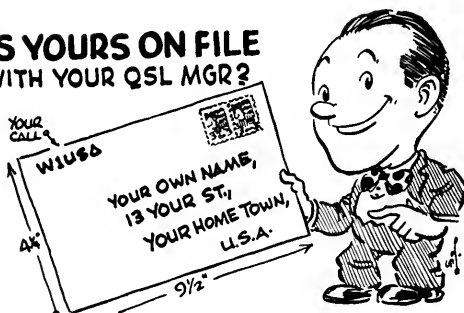
## How's DX?

(Continued from page 59)

plenty good for the last three months, ten good off and on, 20 and 40 always good, and sometimes 75 is good but lots of static on the lower frequencies. I had a couple of schedules on 160 but didn't break through." George is taking back a gallon's worth of new gear, so next time he tries Top Band, watch out! OA5G had eight operators all told, has a 90/40 DX record, and is located atop a bluff overlooking San Juan Bay and the broad Pacific. Antenna space is unlimited and so is good copper wire courtesy Marconi Mining Co. facilities. . . . W1ZDP finds that FM7WTF seeks Idaho, Me., Neb., N. Dak., Nev. and Wyoming for WAS. . . . CX7CO continues to put through a fine 7-Mc. signal with his homebrew c.c. 6V6-807 rig, receiving with a 12-tube double-con super. Prior to CX7CO activation in March of '55, Dan operated a bit at CX31K. One of his most regular QSOers continues to be W2BVS who also likes to "roll his own." . . . W6YY, keeping a sharp ear peeled for Easter Island, reports that CE0AD regularly appears at 0400 GMT of a Friday on 14,098-kc. c.w. and 'phone. . . . On October 15th-17th RCP (Peru) invites the 21 republics of the Americas, plus KL7 and KZ5, to participate in a contest commemorating the 25th anniversary of Radio Club Peruano. Stations in these countries will work each other (no contacts between stations in the same country) once per band during the period 1700 GMT October 15th to 0500 October 17th, exchanging five-digit ('phone) and/or six-digit (c.w.) serials consisting of RS or RST plus a three-digit figure selected at random for the initial contact. (Hereafter one sends the three-digit figure received from the previous station worked.) Multiply total contacts by the total number of band-countries worked, adding to the band-country total the number of different bands used for contacts. (E.g., 30 QSOs times 14 band-countries plus 3 bands equals a final score of 510 points.) As discerned from logs submitted to RCP, Control de Concursos, Casilla No. 538, Lima, Peru, which entries must be in the hands of RCP within 30 days after completion of the test, diplomas and/or medallions will be available to high scorers in each of the Americas, U. S. and Canadian call areas. Separate 'phone and c.w. entries are specified. Note: Entrants are obliged to contact at least 10 Peruvian stations on 'phone, or 3 on c.w., to be eligible for awards.

Hereabouts — W1ZZK has one of those rare HO1EH (HP1EH) QSLs mentioned in a previous column. . . . With 150 countries worked at 150 watts input, K2BZT wonders if any of the kw. boys can match his country-per-watt-average. . . . W6AM made a hit in flashing his Alaskan vacation before the SCDXC boys in the form of 350 color slides. Don divided his time up north between KL7 flora, fauna and bam radio. . . . Ex-TA3AA, now W6OME, entertained W6EAY and a recent San Diego DX Club gathering. Andy could make a kingsized shortsnorter from his XYL's collection of beauteous Turkish rugger. . . . W4VNE's recent DXCC award was his fourth. Mac previously turned the trick thrice as W8LZK, NY4CM and KP4HU. . . . W7CWN, who works his share of 50-watt DX on 20, admits that his BC-348 is aging a bit. Come to think of it, those receivers are at least ten years old now and many of 'em have DXCCs under their belts — still going strong. . . . K2MJG, ex-W8KFY, was aghast to see our 160-meter boldface heading disappear during a summer month or two. Needless to say, if and when 1.8-Mc. DX news transpires you'll find it in "How's". . . . The ARRL DX Century Club Countries List now has been adopted by the Newark News Radio Club, a DX-savoring organization of long standing, as its official DX-performance yardstick.

## IS YOURS ON FILE WITH YOUR QSL MGR?



(See page 54)

# new SELF-SUPPORTING LAY-OVER TOWER

ONE MAN INSTALLATION  
USE NO CONCRETE

## Tele-Vue

**TOWERS, INC.**

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These two towers  
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Change beam from ground level. Telescope to 20 ft. with ratchet reel then crank over with second reel. Tower is re-inforced  $\frac{3}{4}$  in. aircraft tubular steel—husky but light. Base post heavy 3 in. steel pipe with fins.  $\frac{1}{8}$  in. — 1200 lb. test aircraft cable on layover reel. Tower finished 2 coats plus asphalt protective coating supplied for base section.

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## OUR REGULAR TELESCOPING TOWER USED BY HUNDREDS OF HAMS

Stop it any height 20 to 40 ft. Lower for storms. Hinged bottom. Install it yourself. SPRING LOADED RATCHET WINCH CAN BE PADLOCKED. Good looking, husky yet light.  $\frac{3}{4}$  in. aircraft steel. Hoist cable tested for 920 lbs.

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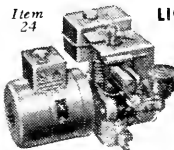
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700-800 Watt Plant (Item 44) same as above but with larger engine and greater capacity. . . . . \$169.95  
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W0LXA

W0ILB

"RED ROOM" DISPLAY COACH K0AST



The XYL of W6JP, the mother of W6MD, and a grandmother besides, is K6DEN, Evelyn Roediger, of Redwood City, Calif. Evelyn uses her Viking and NC 183 on 75 and 20.

## YL News & Views

(Continued from page 52)

W2QHH, Howard Bradley. (Score two for the OMs — it's time for the distaff side to enter the race!)

— ... —

Mrs. George Allinger, XYL of W9MYI, and Mrs. Dewey Darling, XYL of W9WBA, are co-chairmen of women's activities for the ARRL Central Division Convention, South Bend, Ind., Oct. 15th and 16th. The ladies program includes: Sat. morning — coffee get-together; afternoon — entertainment, cards, prizes, and shopping; Sunday — tour of Notre Dame University. There will be a special meeting of all licensed YLs from 1:30 to 3:30 p.m. Saturday. Write Box 351, South Bend, for further information.

### Keeping Up with the Girls

Members who attended the YLRL Wed. morning 'phone net meeting conducted by W4HLF at Skyline Drive, Va.,

(Continued on page 146)



Making it easier to log a Maine YL contact, W1UZR, Rita Slater, of Waterville, is on 75 and 80 daily. With some brawn supplied by local ham friends, Rita puts up her own antennas and enjoys working out technical problems on her own. An OPS and member of six N.E. traffic nets, Rita spends her working hours on 'phone too — at the local telephone office.

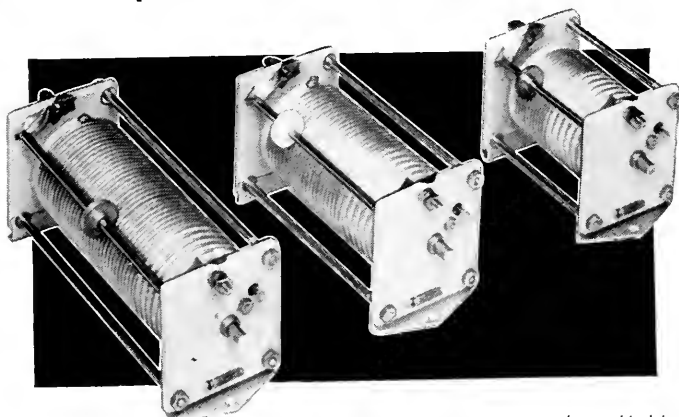


## PROFESSIONAL ROTARY INDUCTORS

...adjust that L/C ratio for top performance at any frequency!

Now, for peak efficiency from pi-networks and other tank circuits choose one of these popular Johnson variable inductors for your equipment. Two new models now available, both variable pitch wound with heavy No. 12 wire—for AM transmitters operating up to 500 watts or for SSB transmitters up to a full kilowatt. Windings mounted on grooved steatite form—contact wheel is spring loaded to provide smooth, reliable inductance variation throughout the entire range. Time-tested by amateurs the country over, these dependable Johnson inductors are your best buy.

Available at Electronic Parts Distributors everywhere.



New 25 uh unit wound with #12 tinned copper wire.  
229-203.....\$11.50  
Amateur Net

New 15 uh unit wound with #12 tinned copper wire.  
229-202.....\$9.75  
Amateur Net

10 uh unit (as used in Johnson Viking II) wound with #14 tinned copper wire.  
229-201.....\$8.85  
Amateur Net



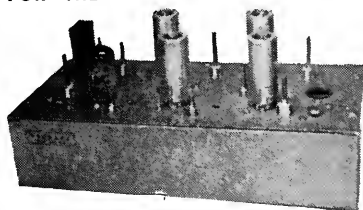
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## Tecraft

**Get Going on 6 QUICKLY!—or on 10-11, 15, 2 or 220**  
YOUR present receiver and one of these Tecraft crystal controlled converters will do the job—ably and economically! During the past 3 years, operators have learned to rely on Tecraft for good, consistent performance on 2 meters. You will find the 6 meter model just as reliable.

FOR THE ULTIMATE IN PERFORMANCE!



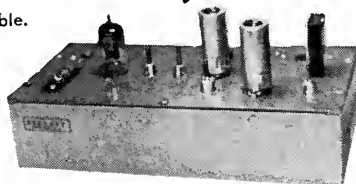
Model  
CC5

Any Model,  
any I.F.  
Complete  
\$42.50

Model  
CC5-50,  
144 and  
148 in kit  
form.  
\$29.75

CC5-50.....50-54 Mc.  
CC5-120.....CAP intercom.  
CC5-144.....144-148 Mc.  
CC5-148.....CAP intercom.  
CC5-220.....220-225 Mc.

Choose I.F. frequency—6-10, 7-11, 8-12, 10-14, 12-16, 14-18 or for COLLINS, 26-30 Mc. Model CC5-220 with I.F. 14 to 19 Mc. only. This is a Cascade model—4db noise figure. (144 Mc) Tube line up: 6BZ7, 2 6CB6, 2 6J6. New-SWR bridge.....\$8.95



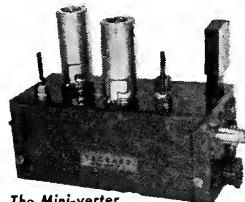
Models C3  
and CC3

Any Model,  
any I.F.  
Complete  
\$34.95

C3-21.....(1-6DC6	6CB6	6J6).....15 meters
C3-26.....(1-6DC6	6CB6	6J6).....10-11 meters
CC3-50.....(1-6BK7	6CB6	6J6).....6 meters
CC3-144.....(1-6BZ7	2-6J6)	.....2 meters
CC3-220.....(1-6BZ7	2-6J6)	.....1 1/4 meters

A natural for MOBILE use. Designed to use the broadcast band of any car radio for tuning. Compact enough to tuck away anywhere. For 15 or 10-11 meters, \$23.95

For 6 or 2 or CAP.....\$25.95  
Tubes, crystal, power and antenna plugs included with all models.  
Other I.F. frequencies on special order.



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# Portable TRANSMITTER/RECEIVER



## For CD, Emergency Units, Clubs and Hams

Measuring only 4" x 6" x 12" and weighing less than 10 lbs., the ECCO HT-2 is specifically designed to meet the demand for an efficient, economical portable transmitter/receiver for 10-meter operation.

Controls are reduced to a minimum; it's inexpensive to operate. Base loaded whip provides maximum flexibility and portability with minimum loss in radiation. Construction and materials of highest quality.

RECEIVER uses 1T4 R.F. amplifier and 3A5 regenerative detector and audio output. TRANSMITTER uses 3A5 oscillator and speech amplifier, 3A4 final amplifier and 3A4 modulator. Carbon microphone input; high level plate modulation. Entire unit operates on one 1½ volt and two 45-volt batteries.

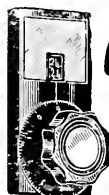
6-meter model available shortly.

MODEL HT-2  
(10-meters) with tubes

**\$74.50**

(Batteries, xtal, headset and microphone not included)

**ELECTRO-COMM CO., Inc.**  
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Registers Fractions to 99.9 Turns

FOR roller inductances, INDUCERS, fine tuning gear reducers, vacuum and other multitar variable condensers. One hole mounting. Handy logging space. Case: 2" x 4". Shaft: ¼" x 3". TC 2 has 2½" dial — 1½" knob. TC 3 has 3" dial — 2½" knob. Black bakelite.

TC 2 \$3.90 — TC 3 \$4.20 — Spinner Handle 75¢ extra  
Parcel Post orders: Add 8¢ for dial

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550-1620 Kc. 3 s/w bands-1.62-32 Mc. FM 27-109 Mc. Temp. comm., Vclt. reg. Six pos. selectivity. Ham net SX-62A **\$349.95**



SX-62A

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**BURSTEIN-APPLEBEE CO., 1012 McGEE ST., KANSAS CITY, MO.**



SCM K2BG sent this photo of K2INQ, Peggy Bergin, of Moorestown, N. J. Using her Dad's rig (W2UA) on the lower frequencies, Peggy operates two-meter mobile with her own call. She takes an active part in the local RACES program, when not on duty as a registered nurse.

presented their NCS with an embroidered picture done by W4SGD, Katherine, and a cake baked by K4BNG, Janie, in appreciation of Arlie's service. Members present were K2IWO, W2OWL, W3s CZT MSU OQF PVH UTR YTM, WN3CEA, K4BNG, W4s AHN BLR BQI DWP HLF SGD. . . . SPARCYLs of St. Petersburg have welcomed four more YLs to membership — KN4EBQ, W4s GXZ HRC, KN4CUY. . . . Eight-year-old KN6MTQ, Elizabeth, and ten-year-old KN6GXQ, Patty, are new members of the San Francisco YLRL club. . . . Minnesota has 40 YLs, according to a count by YLRL chairman for the tenth district, W0KJZ, Lydia. . . . W6PCN, Peggy, and OM W6GCV, are building their house on the highest inhabited ridge on the highest of San Francisco's hills. When they figure out how to set a 70-foot antenna pole into solid rock, the Detschs think they'll have a choice spot for their 20-meter DXing. . . . KZ5VR, Virginia, is a new Canal Zone YL. . . . YLRL Publicity Chairman WITRE announces that the YLRL Photograph Album and Scrapbook are available upon request. Barbara will send the books express collect, and they must be returned postage prepaid.



W1BB, well-known OM of Winthrop, Mass., claims he hasn't had to go without his supper yet, although his wife Alice has done a lot of operating on 80 and 2 since becoming WN1DQF. The Perrys think the answer is to set the XYL's rig right in the kitchen — cooking and QSOing blend well together. With the pet parakeet chirping "hi," Alice has a harmonious atmosphere for preparing the ingredients for her General Class ticket.

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Yessir — we're happy to say that ALL units in our "system-engineered" Bandmaster series are now available to your supply house on an "immediate shipment" basis. There's no excuse for you missing the pleasure of operating this truly exceptional equipment any longer — Order yours today.

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### Save Money—Order in Package Quantities!

Shipment made same day order received.  
All crystals tested and guaranteed to  
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#### PACKAGE DEAL No. 1

25 Assorted FT-243 45 Assorted FT-241A  
15 Assorted FT-171B 15 Assorted CR-1A

**100 Crystals \$8.95**

Assorted.....Regular value \$66.00

#### PACKAGE DEAL No. 2

FT-241A Crystals for Single Sideband  
370 KC-538 KC

**35 Crystals \$3.49**

Assorted.....Regular Value \$14.00

#### PACKAGE DEAL No. 3

HAM BAND CRYSTALS — FT-243

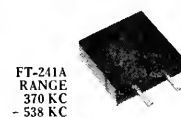
For operating on 80, 40, 20, 15, 10, 6 and  
2 meters—on either fundamentals or  
harmonics.

**25 Crystals \$6.95**

Assorted.....Regular Value \$20.00



FT-243  
RANGE  
1015 KC  
—8733 KC



FT-241A  
RANGE  
370 KC  
—538 KC



FT-171B  
RANGE  
2030 KC  
—3995 KC



CR-1A  
RANGE  
5910 KC  
—7930 KC

INDIVIDUAL CRYSTALS • Indicate 2nd choice—Substitution May Be Necessary

Low Frequency — FT-241A for SSB, Lattice Filter etc., .093" Pins, .486 SPC, marked in Channel Nos. 0 to 79, 54th Harmonic and 270 to 389, 72nd Harmonic, listed below by Fundamental Frequencies, fractions omitted.

49¢ each—10 for \$4.00	79¢ each—10 for \$6.50
370 393 414 483 506 529	400 459
372 394 415 484 507 530	440 461
374 395 416 485 508 531	441 462
375 396 417 486 509 532	442 463
376 397 418 487 510 533	443 464
377 398 419 488 511 534	444 465
378 399 420 489 512 535	445 466
379 401 422 491 513 537	446 467
380 402 423 492 514 538	447 468
381 403 424 493 515	448 469
383 404 425 494 516	450 470
384 405 426 495 518	451 472
385 406 427 496 519	452 473
386 407 431 497 520	453 474
387 408 433 498 522	454 475
388 409 435 501 523	455 476
390 411 436 502 525	456 477
391 412 438 503 526	457 479
392 413 481 504 527	458 480

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CR-1A SCR 522-1/2 Pin. 1/2" SP	FT-171B—BC-610 Banana Plugs, 1/2" SPC
5910 7350 2030 2220 2360 3202 3945	6310 7380 2045 2258 2390 3215 3955
6450 7390 2065 2260 2415 3327 3995	6470 7480 2082 2282 2435 3250
6497 7580 2105 2290 2442 3252	6522 7810 2125 2300 2532 3510
6547 7930 2145 2305 2545 3520	6610 2155 2320 2557 3550

FT-243 — .093" Dia., .486" SPC

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4165 5435 5940 6756 7625 7906	4190 5437 5955 6773 7640 7925
4280 5485 5973 6775 7611 7940	4330 5500 6206 6800 7650 7950
4340 5660 6225 6825 7660 7975	4397 5675 6240 6850 7673 8240
4445 5677 6250 6875 7675 8250	4450 5700 6273 6900 7700 8273
4495 5740 6300 6950 7710 8300	4490 5706 6275 6925 7706 8280
4535 5750 6306 6975 7725 8306	4535 5773 6340 7473 7750 8316
4695 5760 6325 7450 7740 8316	4810 5775 6350 7475 7766 8320
4852 5780 6373 7500 7773 8325	4930 5806 6375 7506 7773 8630
4950 5840 6400 7520 7800 8683	5050 5852 6406 7525 7806 8690
5205 5873 6425 7540 7825	5295 5875 6673 7550 7840
5305 5880 6675 7573 7841	5305 5880 6675 7573 7841
5327 5892 6700 7575 7875	5360 5900 6706 7583 7873

79¢ each—10 for \$6.50

1015 6100 6540 7150 8173 8550	3655 6106 6550 7250 8175 8558
3680 6125 6573 7300 8225 8575	3735 6140 6575 7306 8225 8575
3800 6150 6600 7325 8340 8583	3885 6173 6606 7340 8350 8600
3940 6175 6625 7350 8370 8625	3990 6185 6640 7375 8375 8650
6000 6200 6650 7425 8380 8680	6006 6410 7000 7440 8383 8700
6025 6450 7025 8000 8400 8733	6040 6473 7050 8025 8425
6042 6475 7075 8050 8450	6050 6500 7100 8100 8475
6073 6506 7125 8125 8500	6075 6525 7140 8150 8525

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52 ohm impedance. Use RG8U or RG58U. All brass construction. Mounts on 3/4" pipe

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## GOING MOBILE?

See  
P. 92



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## Happenings

(Continued from page 47)

ment of location (if station identification is necessary to carry on the service, tactical calls or other means of identification will be utilized in accordance with 12.246).

(d) The radio station carrier shall be discontinued during periods of no message transmission.

12.194 *Special Operation*. In certain cases, the Federal Communications Commission may authorize specific stations to operate during a CONELRAD RADIO ALERT in a manner not governed by these Rules, provided, such operation is determined to be necessary in the interest of National Defense or the public welfare.

12.195 *Resumption of Normal Operation*. At the conclusion of a CONELRAD RADIO ALERT, each standard, FM and TV broadcast station will broadcast a CONELRAD RADIO ALL CLEAR MESSAGE. Unless otherwise restricted by order of the Federal Communications Commission, normal operation of stations in the Amateur Radio Service may be resumed upon reception of the CONELRAD RADIO ALL CLEAR. Only the CONELRAD RADIO ALL CLEAR will authorize termination of the CONELRAD RADIO ALERT.

12.196 *CONELRAD TESTS*. So far as practicable, tests and practice operation will be conducted at appropriate intervals.

## CODE PRACTICE FROM VOICE STATIONS

Over the years various amateur stations have conducted programs of instruction in the International Morse Code to help newcomers acquire sufficient skill for their tickets (e.g., see p. 69, May *QST*). In some instances this activity is conducted on the voice bands, with an audio oscillator in front of the mike so that code characters and voice instruction might be interspersed. A special action of FCC some twenty years ago made an exception for this emission in code practice on A-3 bands, but because of its age and obscurity there has been difficulty in recalling its text and application. As the result of conversations between ARRL and FCC it has now, logically, been decided to write the exception into our regulations, and the Commission has proposed to add a Section 12.114 (b) to our rules to provide that "Whenever code practice, in accordance with Section 12.106 (d), is conducted in bands authorized for A-3 emission, radiotelephony tone modulation may be utilized when interspersed with appropriate voice instructions." Any comment on the proposal must be filed by November 15th.

## AT PRESS TIME — 420-MC. RULING

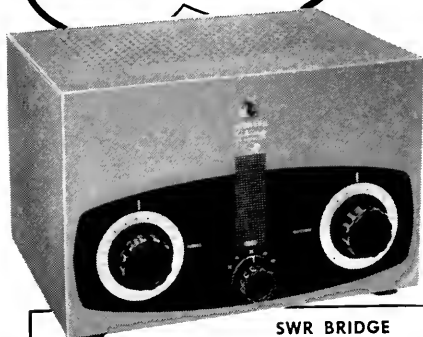
FCC has just issued an order providing that effective October 1st the present 420-Mc. limit of 50 watts peak power will be changed to 50 watts plate input.

## Strays

Amateurs everywhere will be saddened to note that the name of Edward Clark Crossett, W6DZH, ex-W1CCZ, appears in Silent Keys this month. During the late Twenties, many experiments with beam antennas were conducted by prominent amateurs at the site of W1CCZ, Mr. Crossett's station at Wianno, Mass.

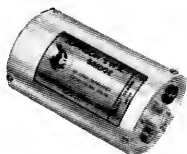
If you operate a kilowatt, or ever plan to—buy your Kilowatt "Matchbox" today. Use it with any lower power unit and switch to maximum power later.

## NEW KILOWATT "MATCHBOX"



### SWR BRIDGE

Required for adjustment of antenna coupler—permits most effective use of a low pass filter. Impedance of 52 ohms, may be changed to 72 with a change of resistor. Equipped with SO-239 connectors and polarized meter jacks for 0-1 ma meter.



Cat. No. 250-24

Amateur Net **\$975**

• Bandswitching • Self-contained • Performs all transmission line matching and switching functions required in the high power station

Now, quickly, easily . . . load and match balanced and unbalanced lines over a wide range of antenna impedances at the kilowatt level. Single knob bandswitching, front panel tuning and matching—no coil changing or tapping necessary. Matches unbalanced impedances from 50 to 1200 ohms—balanced impedances from 50 to 2000 ohms—tunes out large amounts of reactance as well.

Equipped with a heavy duty antenna changeover relay, the Kilowatt "Matchbox" permits separate matching of the antenna to the receiver and also has provision for muting the receiver when transmitting. An electronic time delay circuit prevents arcing of the relay contacts and provides protection for the transmitter components from undue stress of momentary high voltage surges during changeover. Nominal input impedance is 52 ohms—may be used with any transmitter operating up to and including 1000 watts.

Amateur Net

Supplied as a completely assembled and pre-tested unit in an attractive, fully shielded, marmoon and grey cabinet. Cat. No. 250-30

**\$12450**

Sold only through authorized Johnson Distributors—most offer convenient time payment plans.



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**WANTED!** Amateur or govt. surplus receivers, transmitters, test equipment, teletype, Boehme, manuals; such as ART-13, ARN-7, ARC-1, APR-4, 75A, 32V, BC-610, BC-614, BC-342, BC-348, BC-221, TDQ. Cash or trade for NEW Johnson Viking Ranger, B&W, Hallicrafters, Hammarlund, Harvey-Wells, National, Central El, Gonset, Elmac, Morrow, RME, Telrex, Fisher Hi Fi, Pentron, Bell, Master Mobile, Sonar, etc.

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Write or phone, Tom, W1AFN,  
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### AN/APR-4 COMPONENTS WANTED

In any condition. NEW HIGH PRICES. Also top prices for: ARC-1, ARC-3, APR-1, APR-5A, etc.; TS-34 and other "TS" and standard Lab Test equipment, especially for the MICROWAVE REGION; ART-13, BC-348, BC-221, LAE, LAF, LAG, and other quality Surplus equipment; also quantity Spares, tubes, plugs and cable.

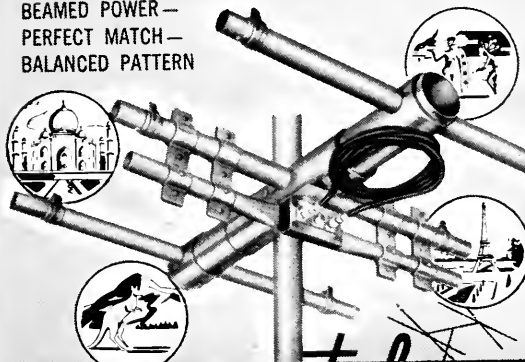
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BEAMED POWER—  
PERFECT MATCH—  
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ROTARIES**

End your antenna problems with the precision-built rotaries that are pre-tuned and matched for optimum performance at your site **WHEREVER YOU ARE**. No tuning or adjusting necessary. Quality constructed of finest materials throughout.

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## THE ULTRA MODULATION UNIT!

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**PREVENTS**— Splatter or increased bandwidth normally caused by high Audio power on any rig from the Johnson Viking Class to the Collins KW-1 Class.

**INCREASES**— The efficiency of Class B linear rigs and the effectiveness of low powered rigs!

**OPERATES**— Through heavy QRM and high noise levels with the overriding effect of strong Audio!

**SIMPLE** to install on any rig:— **LOW** in price!

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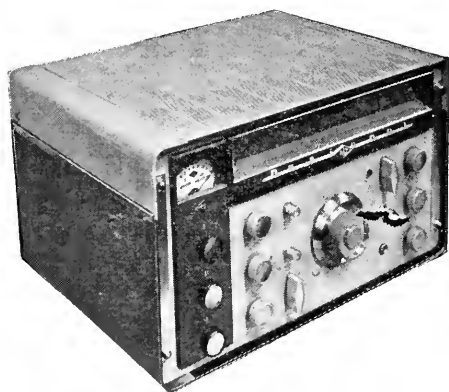
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**S**eparate linear detector for Single Side-Band ... Decreases distortion by allowing AVC "on" with single sideband ... will not block with RF gain full open ... Send for complete specifications and features.

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## Hints & Kinks

(Continued from page 46)

been replaced with a VR-150. This substitution increases the voltage for the oscillator tube and raises the screen potential of the 6L6. Recalibration of the VFO after the modification was not necessary.

—H. Van Hooser, W4DIJ

## CRYSTAL STORAGE RACK

**W**e find it necessary to have quite a number of crystals on hand to cover the whole of any amateur band. When changing frequency, it has been necessary in the past to dig and sort through a box or jar until the appropriate crystal was located.

The confusion associated previously with the selection of a crystal has been eliminated by the rack shown in Fig. 7. The holder was made from a piece of oak board measuring  $\frac{3}{4}$  by  $2\frac{1}{2}$  by 6 inches. The four rows of holes shown in the drawing are made with a No. 39 drill and accommodate a total of 20 Type FT-243 crystals.

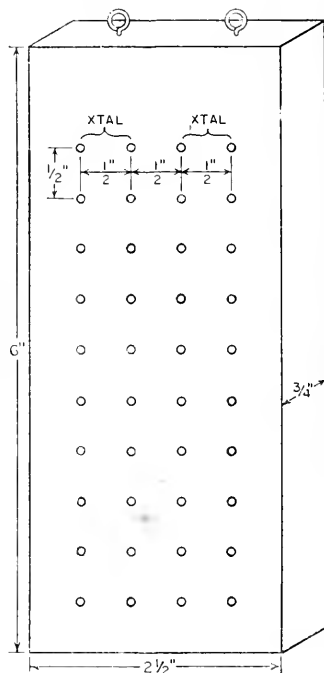


Fig. 7—This crystal storage rack can be an attractive and useful addition to the shack.

The size of the rack was determined by the number of crystals on hand and may be altered to suit the individual requirements. Oak board was selected because of its hardness, thereby preventing the enlargement of the holes through prolonged usage. The whole unit was finished in light oak stain and coated with good varnish. A backing of pool cloth is an extra refinement and a pair of screw eyes permit hanging on a wall.

—Jack C. Andrews, W9YWE



The No. 90672 MILLEN  
ANTENNA BRIDGE—\$45.00

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various pitches and  
wire finishes.

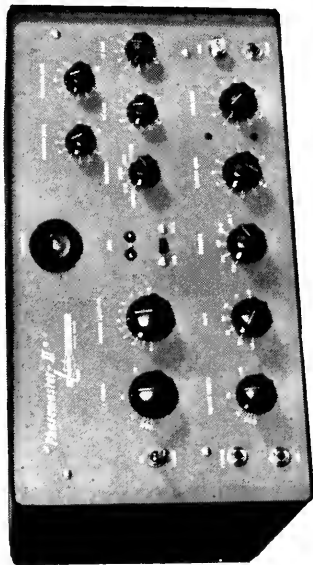
Stocked by your local jobber.

For descriptive literature, and free  
Inductance Calculation Chart, write

**illumitronic**  **engineering**  
sunnyvale california

# here's the ULTIMATE for ALL amateur communications

## AM—PM—CW and SSB . . . the "Phasemaster - II"



**\$329.50**

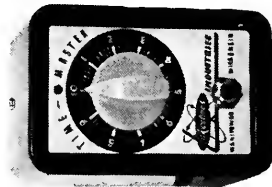
**\$279.50**

Wired and tested

Kit form

phasing type exciter—AM—PM—CW and SSB with switchable sidebands at the flip of a switch—75 W PEP output—completely bandswitched 160 thru 10 meters—wide range network output—fast operating built in anti trap voice control circuit—rounded corner black crackle cabinet with gray front panel, black knobs and white screening—separate phone patch and mike inputs—accessory power socket for accessory equipment—COMPLETE internal shielding including solid shielding for final tank assembly to give stable operation—no critical external carrier balancing controls—new carrier insertion control—new variable calibrating control for zero beating frequency—new eye circuit for precision operation 40 DB or better unwanted sideband suppression—no mixer stage tuning ELIMINATES OUT OF BAND OPERATION—2 additional sets of relay contacts on rear chassis—wired and tested with all tubes or in kit form—a complete wired, tested and ALIGNED audio thru balanced modulator subassembly is furnished with the kit this allows the balance of transmitter to be built as simply as a CW rig—all operating controls on front panel Audio Gain, Carrier Level, Emission, Bandswitch, Buffer Tuning, P A Tuning, Antenna Loading, VFO—CRYSTAL, Function, VC Gain, AT Gain, Indicator Level, Calibrate Level and Eye Indicator.

### TIME MASTER



115 V AC continuous gong timer—pleasant gong strikes automatically every 10 minutes—can be reset to start at any time—dial indicates 10 min time duration—compact molded black case (2 3/4" x 4 1/8" x 2 5/8") with lithographed front face—meets FCC regs 12.82 (a) (1) (iii) & (iv) for 10 min identification requirement—complete with off-on switch and cord—DON'T GET A PINK TICKET

**\$7.95**

Write for special electronic, electrical or mechanical timer requirements

### STONE MASTER



SELF powered, transistorized audio SINE WAVE generator—approx 1200 cycle tone freq—variable from 0 to over .5 volts RMS output with calibrated dial—connects directly to Hiz mike input to provide two tone test for SSB or for checking AM modulation and speech equipment—ideal for audio enthusiasts—portable, can be hand held—A MUST for every shack or service man—no need to buy expensive bulky audio generators—housed in compact black molded case (2 3/4" x 4 1/8" x 2 5/8") with lithographed front face

**\$12.95**



**Lakeshore INDUSTRIES**

408 COMMERCIAL STREET

MANITOWOC, WISCONSIN

MANUFACTURERS OF PRECISION ELECTRONIC EQUIPMENT

# HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature, and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment offered for exchange or for sale by an individual or apparatus offered for exchange or for advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply. To expedite handling of your copy please state whether you are a member of ARRL.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred, but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

*Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.*

**QUARTZ**—Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 2418 Madison Ave., New York City 16.

**MOTOROLA** used FM communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

**WANTED:** Cash or trade, fixed frequency receivers 28/42 Mc. W2VTV, Troy, Ill.

**WANTED:** Early wireless gear, books, magazines and catalogs. Send description and prices. W6GH, 1010 Monte Drive, Santa Barbara, Calif.

**CODE** slow? Try new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

**SUBSCRIPTIONS.** Radio publications. Latest Call Books, \$4.00. Mrs. Earl Mead, Huntley, Montana.

**URGENTLY** need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

**ANTENNA** for bandswitching transmitters up to 300 watts input, approx. 120 feet long, centered with 75-ohm line. 70 feet included, low SWR, tunes 80–40–20–10 meter bands. U.S. Patent 2,535,298. Each one tested for resonance on all bands. Send stamp for details. \$18.95 each. Lattin Radio Laboratories, 1431 Sweeney St., Owensboro, Ky.

**MICHIGAN HAM!** Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel 8-8696. No. 8-8262.

**WANTED:** All types aircraft & ground transmitters, receivers, ART-13, RT18/ARCI, R5/ARN7, BC610E, BC221 mounts and parts wanted. Fairest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

**LEECE-NEVILLE** 6 volt system. 100 amp. alternator, regulator & rectifier, \$60.00. Also Leece-Neville 12-volt system 100 amp. alternator, regulator & rectifier, \$85.00. Good condition. H. A. Zimmermann, 570 Jamaica Ave., Brooklyn 8, N. Y. Ulster 2-3472.

**NEW** and used Motorola, Link, RCA, G-E, etc. FM commercial communications equipment bought & sold. Allan M. Klein, W2FQ, Communications Assoc., 138-17 Springfield Ave., Springfield Gardens, L. I., N. Y.

**WANTED:** ART-13 transmitters. Write B. Spivey, 3117 Rolling Road, Chevy Chase, Md.

**CASH** for AN/ARC-1, BC-610E, BC-614E, BC-939, BC-729, BC-221, TCS and others. Also Sig. Corps, Navy, Air Force stock catalogs; maint. and instr. TM's for war surplus equipment. Amber Co., 393 Greenwich St., New York 13, N. Y.

**NEED** ARC/3a. S. Gabriel, 4908 Hampden Lane, Washington 14, D. C.

**NEED** ARC-1s. Lou Athanas, P. O. Box 5878, Bethesda, Md.

**PANORAMIC** Adapter AN/APA-10 Tech. Manuals, \$2.75 postpaid in U. S. A. Electronicraft, 27 Milburn St., Bronxville 8, N. Y.

**SELL:** 32V1 and 75A1, in excellent condx, \$600. F. o. b. Royal Oak, Mich. L. Opalka, W8WBG, 721 N. Main.

**WANTED:** Bargains in transmitters, receivers, laboratory and test equipment, also miscellaneous and unusual gear, etc. What have you? Please state price desired. Especially interested in husky power supplies, large filter chokes and condensers, etc. Also need plate transformers putting out about 4,000 W or more each side center. Harold Schonwald, W5ZZ, 718 North Broadway, Oklahoma City, 2, Oklahoma.

**QSLs???** Largest variety and finest samples 25¢ (refunded). "Rus" Sakkers, W8DED, P. O. Box 218, Holland, Michigan.

**QSLs-SWLS.** Meade W0KXL, 1507 Central Avenue, Kansas City, Kans.

**QSLs, SWLS.** America's Finest!!! Samples 10¢. C. Fritz, 1213 Briar-gate, Joliet, Ill.

**QSLs-SWLS.** 100, \$2.85 up. Samples 10¢. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

**QSLs.** Nice designs. Samples. Beseparis, W3QCC, 207 S. Balliet St., Frackville Pa.

**QSL Specialists.** Distinctive. Samples free. DRJ Studios, 1811 No. Lowell Ave., Chicago 39, Ill.

**DELUXE QSLs**—Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10¢.

**100 Free QSL cards** with order. Samples 10¢. World Printing, 166 Barkley, Clifton, N. J.

**QSLs-SWLS.** Samples free. Bartinoski, W1YHD, Williamstown, N. J.

**QSLs of distinction!** Three colors and up. 10¢ brings you samples of distinction. Uncle Fred, Box 86, Lynn, Penna.

**QSLs.** Samples free. Albertson, W4HUD, Box 322, High Point, N. C.

**QSLs "Brownie."** W3CJ1, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

**QSL-SWL cards.** Sensational offer, Bristol stock 500 1 color \$3.95, 2 color \$4.95, 3 color \$5.95. Super gloss \$1.25 extra. Rainbow cards. Samples 10¢. QSL Press, Box 71, Passaic, N. J.

**QSL samples.** Dime, refunded. Roy Gale, W1BD, Watford, Conn.

**QSLs-SWLS.** Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

**QSL's.** Beautiful blue, silver and gold on glossy cards, \$3.85 per 100 or \$7.50 for 200 postpaid. 2 day service. Satisfaction guaranteed. Order and get pleasant surprise. The Constantine Press, Bladensburg, Maryland.

**QSL's.** Western states only. Fast delivery. Samples 10¢. Dauphinee, K0JCN, Box 66009, Mar Vista 66, Calif.

**UNUSUAL!** Vivacious! Illustrated QSLs, typolithographed. Free samples. WAT Box 128, Breckville, Ohio.

**DELUXE QSLs.** Samples dime. M. Vincek, W2LNT, 117 Center St., Clifton, N. J.

**QSLs.** Samples dime. Printer, Corwith, Iowa.

**QSLs-SWLS.** Samples free. Backus, 5318 Walker Ave., Richmond, Va.

**QSLs, SWLS.** 2-colors. 125, \$2.00. Bob Garra, W3UQL, Lehighton, Penna.

**WOODY'S** (Formerly Rosedale Press QSLs). Box 164, Asher Sta., Little Rock, Ark.

**QSLs**—The kind you want. Samples 10¢. Graphic Crafts, Route 12, Ft. Wayne, Ind.

**QSL's.** Attractive. Samples free. Jones, W3EHA, 840 Terrace North, Hagerstown, Md.

**QSLs-SWLS.** Rainbow, cartoon, others. Reasonable! Samples 10¢ (refunded). Joe Harms, W1GET (W2JME), Plaistow, N. H.

**QSL's!** Modern, better quality designs. Samples 10¢. Tooker Press, 1 Akehurst, New Jersey.

**QSLs.** New designs. 2-call and photo cards. Star Printing, 130 S. Glenoaks, Burbank, Calif.

**QSLs.** Taprint, Union, Miss.

**QSLs Multicolor,** all kinds, all prices. Samples dime. Fast service. DX Cards, 2 Kulik St., Clifton, N. J.

**QSLs.** Highest quality, quick delivery. Samples 10¢. Dortch, Jocelyn Hollow Road, Nashville, Tenn.

**ART-13 Wanted:** W4VHG, 4908 Hampden Lane, Bethesda, Md.

**CASH** for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallerlathers, Hammarlund, Johnson, Lyco, Master Mobile, Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

**CLEANING** out equipment excess to my needs; books, magazines, parts, AM, CW, SSB ham equipment, phonograph, radio, amplifier, TV set. Stamp for list. Consider trades. W4AP1, Spitz, 1420 South Randolph, Arlington, Va.

**BC-610E,** speech amplifier, mike, spare parts. WAS and DXCC 10 meter phone. \$500.00. C. J. Ahern, Jr., W9WXT, Dwight, Ill.

**UFO Patrol** data. W5CA.

**NEW ICA** deluxe Signatone Code Oscillator (Reg. \$15.75); Special, \$7.95. Key, \$1.35 extra. Surplus RG-8/U cable, 100 ft., \$5.95, 250 ft., \$13.25, 500 ft., \$25.00. Free Bargain Bulletin. Visit store for unadvertised bargains. Lectronic Research, 719 Arch St., Philadelphia 6, Pa.

**WANTED:** Amateur and aircraft receivers, transmitters, direction finders. Especially APR-4, APR-5, ARN-7, ARC-1, ART-13, BC-finders. 610, BC-939, BC-348, teletype, BC-221, 32V, 75A, test equipment. Cash or trade for New Johnson Viking, Ranger, Central Electronics, Hallerlathers, Hammarlund, National, B&W, Gonset, Elmac, Harvey-Wells, Morrow, Telrex, Fisher Hi-Fi, etc. Write: Altronics, Box 19, Boston 1, Mass. Richmond 2-0048 (Stores: 44 Canal, Boston; 60 Spring, Newport, R. I.).

**FOR SALE:** Perfect working condition: TVI-suppressed, commercially built 500 watt phone/c.w. xmitter, complete with 866s splatter suppressor, variac-controlled power supply, modulator (pair 811As); Miller 90991 final (812As); Miller 90800 exciter, all in new deluxe 6 ft. locked door (Palate); Collins VFO 310C2 with built-in power supply, coils, all bands, also Collins VFO 310C2 with built-in power supply, Stromberg-Carlson speech amplifier and Harrison 500 watt antenna tuner with all coils. First bid \$460 or over takes all. Single package, Phone DEator 2-4119, WIUWB, Julian Sobin, 83 Arnold Rd., Newton Center 59, Mass.

**FOR SALE:** Hammarlund SP-400X in like new condx: \$250. Dr. Stephen R. Fromm, 35 Revere St., Boston 14, Mass.

**WANTED:** Complete used 12 v. mobile rig in gnd condx or used Gonset Communicator. Contact Ronnie Gann, W1FGF, c/o ARRL, 38 LaSalle Rd., West Hartford 7, Conn.

QPD? Use Stick-Tack. See page 141. The Radio Stationers.

**COLLINS** 32V-3 in excellent condition, \$525.00. George Sperry, 108 Oak Hill, Portsmouth, Vt.

**SELL:** Collins 75A-2, \$295; 310C, \$125.00. Dumont #241 'scope, \$225; 32V2, \$395.00; 12,000 ohm relays, 110 VAC dpt., \$1.75; Test-type equipment, Collins 30-1 \$275.00; Want: APR-X receiver and tuning units, ARN-7, ART-13, Tom Howard, WIAFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. Richmond 2-0916.

**TROUBLE** Getting out? Put a punch in your signal the easy low-cost way. Low Loss open wire folded dipole antennas, \$4.95 and up. Write for free literature. R. J. Buchan Co., Bricelyn 4, Minn.

**FOR Sale:** 500 watt AM rig. Band-switching, gang-tuned exciter in grey desk cabinet (Collins PTO oscillator ganged to four 6AQ5 frequency multipliers, pr. 6146s, MB 150 tank); final: pr 800Ss. Modulator: pr 805s, 500 watt Thordarson modulator xfmr, 6 ft. Par-Metal grey cabinet. Commercial appearance fully metered. TVI-suppressed. Picture is available. Elvin Miller, Albany, Ind.

**TRADE** for good 32V2 or 32V3, \$600 as new, Zeiss Contax II, with 50 mm Zeiss Sonnar f 1.5, 85 mm Zeiss Triotar, viewfinder, Weston meter 500 watt, Bell Howell new slide projector, 3 cases used eight rolls film, R. M. Reavis, W50WG, 127 W. Main, Ardmore, Okla.

**SELL:** SX-71 recvr & spkr, 100-watt bandswitching fone xmtr with built-in VFO, Baluns, low pass filter, ant. relay, 2 element 20 meter beam with rotator; \$300. L. A. Haley, W3YAD, 201 Light-house Rd., Gordon Hts., Wilmington, Del.

**FOR Sale:** 20A complete, factory-wired, HRO-60, complete coils A,B,C,D, factory-wired in slicer; three units, first \$575 takes it. Guaranteed perfect. O. W. Greene, WICPI, Box 171, Wakefield, R. I. Tel. Narr. 3-4316, F.o.b. custom crated.

**WANTED:** Pointer coupons from Olson-Arrow, Ohio. Cash or trade electronic or ham gear, any quantity. W4WT, Eubank, 1227 Windsor Ave., Richmond 27, Va.

**OST:** Wanted July 1932, good clean copy. State price. G. Kirchhoff, L69 Riverside Isle, Fox Lake, Ill.

**FOR Sale:** 4-Band HT-17 and S-72R. \$60 takes it. Stanley Wilk, Jr. 14 Dwight Cts., New Britain, Conn.

**WANTED:** APR-4 receiver; TN-16, TN-17, TN-18 tuning units. Kaar Engineering Corporation, P.O. Box 1320, Palo Alto, Calif.

**FOR Sale or trade:** New Harvey-Wells VFO; MicroMatch SWR meter; 4E27s. Trade for 810s, plus cash. W0SYA, 2619 So. Gaylord, Denver 10, Colo.

**RECEIVERS** repaired and aligned by competent engineers, using factory standard instruments. Hallicrafters, Hammarlund, National, Collins, Autocoll, service stations. Our twentieth year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

**QSTS** 1932 thru 1954 including six binders. Estate of W6YHG/W5BID. Best offer. W6WNI, 2042 Forest, Belmont, Calif.

**AMATEUR** Headquarters San Joaquin Valley. Major lines, communication receiver repairs. Trades, mail orders. Carlisle, W6VBQ, San Joaquin Electronics Supply, 710 E. Charter Way, Stockton, Calif.

**CHROME** Zippo lighter, your call engraved. Lifetime guarantee, \$4.50 postpaid. Nice Xmas gift. Sharp Gifts, 129 W. Main, Ardmore, Okla.

**FOR Sale:** National NC-183-DT, three months old, w/matching spkr, in purifier operating condx. Bodeb DVI-110-G 16 amp., and Collins 1127-270 power supply with GE RPX-050 crtg. Prefer local contact. Richard Ebeling, 33 Randolph Road, White Plains, N. Y.

**WANTED:** Gonset Communicator 6 meter deluxe; 115 volts AC-12 volts DC; Model No. 3058; complete; best figure. R. Gerlach, W3UUM, 1029 Hoover Ave., Feasterville, Pa.

**SELL** NC-183, in original carton. Used less than 100 hours. No room at this QTH. \$165.00. Leigh Robartes, W2EHA, 22 Hapsburg Place, Hempstead, L. I., N. Y. Tel. IVanhoe 6-8451.

**COLLINS** 32V-3 transmitter, like new and in original carton, for immediate sale at low price of only \$499.00! Guaranteed perfect! Will prepay shipment up to 1000 miles! This is best buy on this famous rig. Write to F. W. Cooper, W0TOS, 901 S. 86th St., Omaha 3, Nebr.

**FOR Sale:** BC-457 converted to ten; 815 modulator, control box, 10-meter Gonset, relay, hash filter. Best offer takes. J. Ed Ballard, Jr., W3KKH, 3021 Fendall Road, Baltimore 7, Md.

**SELL** or trade for new or used Collins receivers; complete mobile rig, mount, mike and all relays, \$225.00. W4DXJ, Jack, Box 642, Greenville, N. C.

**VIKING** II, with VFO, \$270; Elmac AF-67, \$125.00; Gonset Super-Six, \$37.00; noise clipper, \$5.00; Carter 6 v. dynamotor with relay, \$20.00; Johnson Whipload Six with 8 ft. whip, \$15.00; 6 v. coax relay, \$5.00; Master 132XC, \$6.00. All in "like new" condx. Complete mobile, \$200. F.o.b. Sacramento, Calif. W6LPN, 1116 Volz Drive.

**SELL:** HQ-129, HV pwr supplies parts, assorted vacuum tubes incl. two 813s; heavy duty work table. Cash and carry. Inspection invited. NYC area. W2T1W, 765 East 175th St., Bronx, N. Y. Tel. TR 8-0949 evenings.

**FOR Sale:** HRO-7 receiver with four coils, power supply, speaker. Excellent condx. \$150.00. Gene Schlig, 717 Crotona Park North, Bronx 57, N. Y.

**SELL:** HQ-129X, \$125.00; Collins 310B-1, TVI suppressed, \$200.00. Both like new. WO B. F. Brown, Staff, Compibpac, USNAB, Coronado, Calif.

**FOR Sale:** BC453, 454, 455, 946 converted, in cabinet, bandswitching, power supply, speaker, \$50.00. Gonset Tri-band, \$30.00; 522 receiver, converted, cabinet, Millen breadspread dial, S meter, \$25.00. Gonset 2-meter converter, new, boxed, \$35.00; BC459 with power supply, \$15.00; BC457, like new, \$8.00; Silver Spark signal tracer, like new, \$22.50; Gonset Model B, noise clipper, like new, \$5.00; 75-meter MAB Navy Handie-Talkie with new Vibrator power supply and storage battery, \$25.00; Master Mobile Mount 132XC, \$6.50. W2JCI, Daniel Rosenbaum, 1450 48th St., Brooklyn 19, N. Y.

**WANTED:** Good communications receiver. Will sell or trade following: Harvey-Wells DPSSO dynamotor unit; S-38 Hallicrafters, Gonset 3-30 converter, Shure Mod. 100 mike, Carter Magmotor, 5.5 v. at 400 v. 150 a. What's your offer? J. Schenck, W3S1W, 17 Pontiac Rd., Pittsburgh 34, Penna.

**FOR Sale:** 1 Kw phone transmitter complete, in two Par-Metal cabinets; Meissner EX signal shifter driving single 4-125, a complete 200 watt rig with modulators, driving a pr. 250THs in final with 250TH modulators. Coils for all bands except 40 meters. Spare 250TH and 4-125. All Stancor transformers and Cardwell variable condensers. Not junk and has been operating within the past 30 days. Have to move. Ben Weidner, W0HNG, Box 485, Coffeyville, Kans.

**SELL:** Trade: 5 newly constructed 30-watt Novice or advanced xmtr, \$25.00 each; 15 watt amplifier, \$20.00; 40-watt modulator, \$12.00; 100-watt modulator, \$20.00; 10-watt Hi-Fi amplifier, \$15.00; supplies: 800v. 275 Ma., 6.3v. \$18.00; dual: 1000v. 275 Ma., 400v. 100 Ma., 6.3v., \$25.00; Vibrapaks: 6v. 400 v. 90 Ma., \$8.00; Dual: 425v. 150 Ma., \$15.00; Dynamotor, 6-12v. 450v., 150 Ma. Pictures of above available. Need: Receiver, grid dipper, E.M.C. model 102 and 103 V.O.M. Zuchora, W8QKU, 7428 Meade St., Detroit 12, Mich.

**WANTED:** Model A or B slicer or kit; also an Instructograph, W4PRM, 816 Melrose St., Winston-Salem, N.C. Carolina.

**100 Kc.** crystal standards, brand new, with tube and xtal. Clearance priced at \$7.25. c/o W2LZX, Gutzeit, Rogers Electronic Corp., 49 Bleeker Street, New York 12, N.Y.

**FOR Sale:** Globe King 400B. Good condition. Best offer over \$325 takes it. J. L. Ruggieri, 165 W. Washington, Martinsville, Ind.

**WANTED** to buy: National AA coil. W9ZEN, Vasicak, 124 Glen Oglesby, Ill.

**SELL** or Swap: Power supply 500 volts, \$10. Also 700 volts, \$15.00. Both for \$20.00. Need 813 tube. Or what have you? S. J. Flick, W3NRB, 5720 Madison Drive, Verona, Pa.

**SALE:** Heathkit AT-1, used only 3 mos., \$25.00; Harvey-Wells pwr supply, \$20.00; Home-made antenna coupler, \$3.50; PE-103, used, \$15.00; 6 v. dynamotor, 425 v. at 375 Ma., used, \$15.00; Panadator, smoke damper, works OK, \$27.50; Lucky Strike geiger counter, with meter, \$65.00; Thermanin \$10.00; Linc welder, 60-110 v. welder, \$25.00; 60 amp. ree generator rebuilt \$15.00; Bud cabinet rack, 28 in. high, unused, \$12.50; G. A. Wildeboer, W0KHJ, Savannah, Missouri.

**WANTED:** G. H. and J. coils (low frequency) for HRO-5TA1. W9FJ, Campbell, 3013 Oak St., Evansville 14, Ind.

**FOR Sale:** SX-71 Hallicrafters recvr and spkr, like new: \$115.00. F.o.b. Richmond, Va. J. R. Driver, W4ZRS, 6419 Fitzhugh Ave., Richmond, Va.

**COLLINS** 75A-4, 3 and .8 Kc. filter. First \$630. Rudy Ehrhardt, W2PVI, 670 South Street, East Aurora, N. Y.

**VIKING** II transmitter, VFO, new spare 6146s, coaxial antenna relay, \$260. W4MZM/2, Matthews, Highland, N. Y.

**SELL:** Complete station: \$535: HQ-129X with speaker, like new, Johnson Viking II, Johnson V.F.O., Johnson Match Box, Johnson SWP Bridge, all factory-wired, 6 months old, 707A Shure mike. Will ship any place collect. W0QSH, Donald E. Carlson, Clarkfield, Minn.

**WILL** trade Lysco antenna coupler, 300 watt audio Class B xfmr's and 80 & 40 meter command xmtr's for grid dip meter or bug. Cash difference on any unequal trade. William Toben, 121 West Delano, Tucson, Ariz.

**SELL:** 125-watt AM modulator, speech amplifier, tubes, complete less high voltage supply. JT-30 Astatic mike. Like new. All for \$58.00. W0DMA, Smith, Caledonia, Minn.

**FOR Sale:** Channel 8-32 element UHF Resonator beam. Can be used on higher frequencies: \$25.00. Peck, 143 State, Auburn, N. Y. Tel. 3-3531.

**SELLING:** New NC-88 receiver, never been used. Worth \$119.95. Sacrifice for \$99.00 plus postage. Need cash. Richard Pugh, W3WGJ, 2302 Franklin St., Johnson, Penna.

**COLLINS** 30k, clean, complete, \$950; Collins 32V3, same as new, \$475; 32V1, \$340; NC183, good condx, \$150; SX28 with J. L. McLaughlin single sideband selector, \$180; Hallicrafters HT-8 Radiophone with A.C. power supply, operates on marine frequencies, \$80; Kohler light plant, model 800, 110 V. 60 cycles, in gud condx, not surplus, \$150; Hunter Cyclomaster VFO, \$115; new PE103, \$30; will trade for Collins transmitters and receivers, National products, or single sideband equipment. W4MIP.

**SELL:** Super Pro (BC-779A), clean, like new, instruction book, original carton, \$145 cash and carry. W2CJY, George Ruffis, Jr., 8 Brookwood Drive, Manhasset, L. I., N. Y. Phone: MANhasset 7-0407.

**ELMAC** receiver, perfect, new 12 volt power supply, both \$125; new Palco 12 volt power supply, \$30, relays, body mount, other misc. gear. Marcel Valois, Box 488, Covington, La.

**FOR Sale:** BC221-P 125-20000 Kc. with original calibration book, metal case, \$95.00. W4EAS, Box 2138 Univ. Sta., Gainesville, Florida.

**SIDEBAND!** Brand new unused B&W 515B sideband generator, \$230.00. Late model 75A2, \$300.00; model A slicer with API, \$40.00. W1SUQ.

**SELL:** Viking "Adventurer", \$45.00; Heathkit VF-1, \$15. Alex Lyon, K2JYJ, Rte. 3, Wilton Rd., Huntington, N. Y.

**NED:** May and June 1916 QSTs to complete set. J. Simpson, 85-39 152 St., Jamaica, L. I., N. Y.

**SELL:** Gonset Communicator, new condition in original carton with xtal microphone, \$185.00 cash. W1CLE, Washburn, RFD #1, Altou, N. H. Tel. 252-2222.

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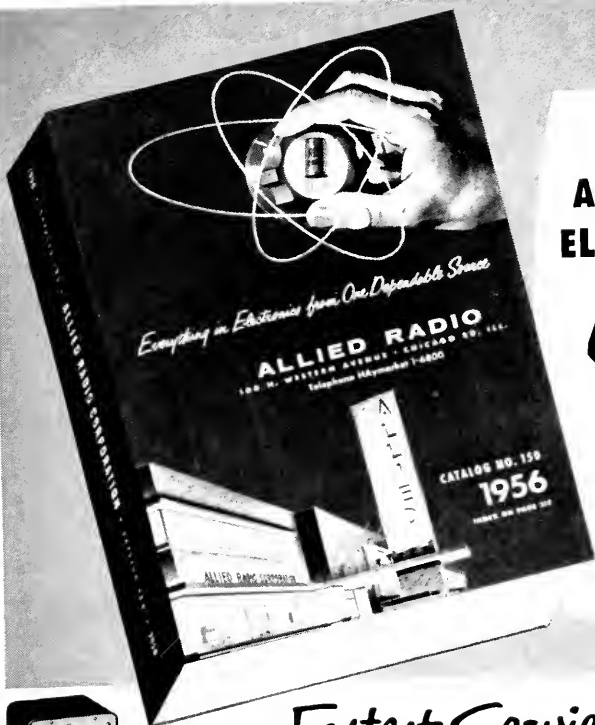
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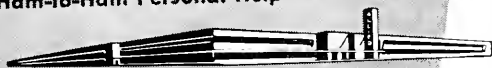


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Baltimore 1  
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Hiller  
Polab, Inc.  
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Sickle Radio Co.  
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Lafayette Radio  
Radio Wire Television, Inc.  
100 Sixth Avenue  
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Peerless Radio Dist., Inc.  
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Rochester Radio Supply  
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Rochester 6  
Radio Equipment Corp.  
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Radelco, Inc.  
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Mount Vernon  
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Syracuse Radio Supply, Inc.  
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Syracuse 3  
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123 S. Tioga St.  
Ithaca  
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Supply Co., Inc.  
602-610 Mamaroneck  
Avenue  
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Winston-Salem  
Freck Radio & Supply Co.  
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Asheville  
Radio Equipment Co.  
306 Cotanche St.  
Greenville  
Shifflet & Dickson, Inc.  
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Gastonia

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Fargo  
Maytag Electric Co.  
P. O. Box 672  
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Mandan Electric Supply  
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Mandan

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Cleveland 15  
Sun Radio  
110 East Martin St.  
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Electronic Supplies, Inc.  
1320 Madison Ave.  
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Steinbergs, Inc.  
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114 North Third Street  
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Portland 5  
United Radio Supply Inc.  
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Portland  
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Philadelphia 6  
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D & H Distributing Co.  
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Federated Purchaser  
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Allentown  
General Radio & Elec. Co.  
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Wilkes-Barre  
Electronic Research Labs  
715 Arch St.  
Philadelphia 6  
Moyer Electronics Supply  
Co., Inc.  
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Columbia  
Florence Radio Supply, Inc.  
355-65 North Irby Street  
Florence

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Burghardt Radio Supply,  
Inc.  
Watertown, Aberdeen,  
Rapid City

**TENNESSEE**

Bluff City Dist. Co.  
Memphis  
Curle Radio Supply  
439 Broad Street  
Chattanooga 2  
Electra Distributing Co.  
1914 West End Ave.  
Nashville 4  
L. K. Rush Company  
101-103 Highland Ave.  
Jackson  
W & W Distributing Co.  
644 Madison Ave.  
Memphis

**TEXAS**

Busacker Electronic Equip.  
Co.  
1216 W. Clay Ave.  
Houston 19  
Crabtree's Wholesale Radio  
2608 Ross Ave.  
Dallas 1  
Electronics Equipment Co.  
917 Florence St.  
Fort Worth  
Lamp's 'Electronics Ltd.  
828 Brooklyn  
San Antonio 10  
C. C. McNicol  
811 Estrella St.  
El Paso  
Rio Radio Supply Co.  
McAllen  
RC & LC Hall  
1219 Caroline  
Houston  
1141 Park Ave.  
Beaumont  
Swico, Inc.  
512-18 E. Lancaster  
Fort Worth  
Texas Electronic Supply  
1202 W. 5th St.  
Austin

**UTAH**

Standard Supply Co.  
225 E. 6th South  
Salt Lake City

**VIRGINIA**

Bristol Radio Supply Corp.  
31 Moore Street  
Bristol  
Radio Equipment Co.  
821 W. 21st St.  
Norfolk  
Radio Supply Co.  
3302 W. Broad St.  
Richmond  
Southern Electric Corp.  
818 Greenville Ave.  
Staunton

**WASHINGTON**

C & G Radio Supply Company  
1303 Pacific Avenue  
Bremerton  
318 North Capitol Way  
Olympia  
510 West Wishkah  
Aberdeen  
2502 Jefferson  
Tacoma  
Northwest Electronics  
N. 102 Monroe St.  
Spokane 1  
Pacific Electronics Sales Co.  
1209 1st Ave.  
Seattle 1  
Seattle Radio Supply  
2117 Second Ave.  
Seattle  
Waitkus Supply Co.  
110 Grand Ave.  
Bellingham

**WEST VIRGINIA**

Chemcity Electronic Dist.  
1637 Fourth Ave.  
P. O. Box 2066  
Charleston

**WISCONSIN**

A & F Electro-Mart  
7833 W. Greenfield Ave.  
Milwaukee 14  
Bushland Radio Specialties  
9 W. Spring St.  
Chippewa Falls  
Harris Radio Corporation  
111 No. 10th Street  
Manitowac  
289 No. Main St.  
Fond Du Lac  
Satterfield Electronics Inc.  
326-28 W. Gorham St.  
Madison 3  
Valley Radio Distributors  
513 N. Appleton St.  
Appleton

**ALASKA**

Yukon Radio Supply, Inc.  
Box 406  
Anchorage

**HAWAII**

Radio Wholesale & Supply  
P. O. Box 3768  
Honolulu 11

**CANADA**

Alpha Aracón Radio  
29 Adelaide St. West  
Toronto, Ontario  
Anguish Limited  
Brantford, Ontario  
Crawford Radio  
119-121 John St. N.  
Hamilton, Ontario  
Johnson Electric Supply  
135 McIntyre St.  
North Bay, Ontario  
Geo. M. LaTour  
1540 — 3rd Ave.  
Quebec City, P. Q.  
MacDonald Electric Ltd.  
307 Queen St. South  
Kitchener, Ontario  
Payette Radio Ltd.  
730 St. James W.  
Montreal, P. Q.  
Edwards Sudbury Ltd.  
69 Elm Street West  
Sudbury, Ontario  
Taylor & Pearson (B.C.) Ltd.  
1006 Richards St.  
Vancouver 2, B. C.  
The Radio Centre  
72 Craig St. W.  
Montreal, P. Q.  
Wholesale Radio &  
Electronics  
1143 Bay St.  
Toronto, Ontario  
Phonovision Dist. Co.  
388 King St.  
Kingston, Ontario  
Fisher Radio Company  
649 Colborne St.  
London, Ontario  
Wackide Radio TV Labs Ltd.  
28 Laurier Ave. West  
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No greater sensitivity in any ham receiver at any price (3-6 db noise figure on all amateur bands) plus...greater stability than most receivers costing \$695...plus all these sensational new features and priced at only \$349.95!

**NEW!** Features a total of 10 dial scales for coverage of 160 to 1 1/2 meters with National's exclusive new converter provision with the receiver scales calibrated for 6, 2, 1 1/2 meters using a special 30-35 mc tunable IF band.

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**NEW!** 3 position IF selector—.5 kc, 3.5 kc, 8 kc—provides super selectivity, gives optimum band width for CW, phone, phone net or VHF operation.

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**NEW!** Hi-speed, smooth inertia tuning dial with 40 to 1 ratio! Provides easier, more accurate tuning. Smoothest dial you've ever used.

**NEW!** Exclusive optional RF gain provision for best CW results allows independent control of IF gain!

**NEW!** Giant, easy to read, "S" meter!

**NEW!** Provision for external control of RF gain automatically during transmitting periods.

**NEW!** Muting provision for CW break-in operation.

**PLUS!**—the newest look in ham receivers... "Massive in the modern manner"... truly a "dream receiver" that can be used either as a table or rack model!

**PLUS!**—all these other sensational National features:

★—Calibration reset adjustable from front panel to provide exact frequency setting!

★—Dual conversion with better than 50 db primary image rejection on all amateur bands, plus better than 60 db secondary image rejection!

★—Xtal filter with phasing control and 3 position band width control!

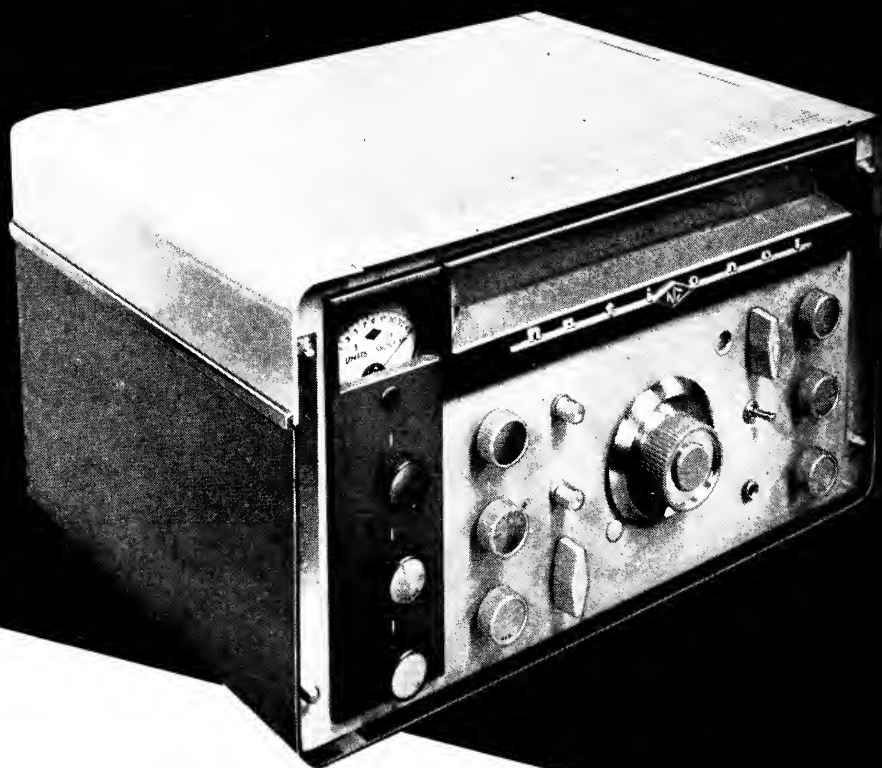
★—Wide range tone control—for control of both low frequency and high frequency end of response curve!

★—Socket for Xtal calibrator plus accessory socket for powering converters and future accessories!

★—1st IF frequency—2215 kc

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Calibration correct  
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On/off limiter  
IF selectivity  
Xtal selectivity  
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Bandwidth  
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★ 10 tubes, plus 441-C  
current regulator, 5Y3  
rectifier and 6X2  
voltage regulator

★ Tube complement

6BZ6 RT  
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6BL6 2nd mixer  
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6BZ6 2nd IF  
6AL5 ANL and detector  
6BH6 1 W-O SSB det  
12 AT 17 1st audio and  
8 meter amp  
6AQ5 audio output

★ Power consumption  
60 watts

★ Power output  
1 watt undistorted

★ Power source 110-120  
volts AC 60 cycles

★ Antenna input impedance  
50-300 ohms

★ Output impedance —  
8 ohms

★ Tuning system com-  
bination gear-pinch

★ Band designation  
and length

160 meters — 1.8 to 2.0  
megacycles

80 meters — 3.5 to 4.0  
megacycles

40 meters — 7.0 to 7.3  
megacycles

20 meters — 14.0 to 14.4  
megacycles

15 meters — 21.0 to 21.5  
megacycles

11 meters — 26.5 to 27.5  
megacycles

10 meters — 28.0 to 29.7  
megacycles

6 meters — 49.5 to 54.5  
megacycles\*

2 meters — 143.5 to 148.5  
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1 1/2 meters — 220 to 225  
megacycles\*

\* Usable with accessory  
converters optional at  
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★ Frequency response —  
200 to 3,000 cycles for  
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★ — Shipping weight —

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19 1/2" Wide (19" rack out  
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